2019 North Pacific Arctic Conference Proceedings

The Arctic in World Affairs

A North Pacific Dialogue on Global-Arctic Interactions: The Arctic Moves from Periphery to Center

Edited by
Robert W. Corell, Jong Deog Kim, Yoon Hyung Kim, Arild Moe, Charles E. Morrison, David L. VanderZwaag, Oran R. Young

KMI KOREA MARITIME INSTITUTE

EAST-WEST CENTER

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Preface

The North Pacific Arctic Conference (NPAC), now in its ninth year, provides a venue for off-the-record engagement among policymakers/practitioners and scientists/analysts regarding Arctic issues of mutual interest to leading North Pacific Arctic states (Canada, Russia, and the United States) and non-Arctic states (China, Japan, and Korea). NPAC aims to anticipate and react to emerging policy issues and to promote improved understanding of major options for addressing them among these six states, both in the setting provided by the Arctic Council and in other contexts. All six states are members of the G20. Together, they account for more than 50 percent of the world's greenhouse gas emissions as well as a large share of global commerce.

Specifically, NPAC endeavors to identify emerging key policy-relevant Arctic issues by considering contemporary global political, economic, and environmental realities and exploring alternative ways to frame them. One goal is to improve the dialogue between practitioners (including government officials, industry executives, Indigenous leaders, and civil society leaders) and analysts (including scientists, engineers, emerging young specialists, and other experts) from the Arctic region and beyond. NPAC further seeks to develop effective strategies for communicating emerging key policy findings and the results of relevant scientific research to a range of targeted audiences.

Unprecedented changes in the global climate system are spurring transformative consequences for the planet—and progressively visible impacts in the Arctic and beyond. It is increasingly clear that global and Arctic regional trends and patterns of change will be substantively different from past decades. First and foremost, the past 10,000 years until the Industrial Age was the most stable interglacial period. During this period, global mean surface temperatures varied by less than +/– 0.7°C. However, the current global mean surface temperature is now about 1°C above the pre-industrial level, and the mean circumpolar Arctic surface temperature is about 2°C to 2.5°C above that level.

During the Eemian interglacial, about 125,000 years ago, the global mean annual surface temperatures were warmer than pre-industrial levels by about 1°C to 2°C and the Arctic surface temperatures were at least 2°C warmer than present. It is now clear that the current interglacial period

is experiencing accelerating warming, due largely to the effects of the Industrial Revolution—from 1750 onward—and the concurrent rise in fossil fuel energy use over the past two and a half centuries. Global fossil CO_2 emissions have increased from about two million metric tonnes in 1750 to more than 37 Gigatonnes (Gt) by 2019. Carbon dioxide concentrations are currently at about 415 ppm, which is higher than at any time in more than 800,000 years. As reported by the Intergovernmental Panel on Climate Change (IPCC), anthropogenic emissions account for about 70 percent of the changes in the climate system. Approximately 30 percent is attributable to natural variability.

During this same period, global population has increased almost tenfold, from about 790 million in 1750 to 7.7 billion in 2019. These clearly are unparalleled patterns of accelerating change on both global and regional scales, with unprecedented impacts on planetary systems and human societies.

Projections regarding the character and importance that these changes will provoke in the Arctic region over the next few decades are now emerging to have global consequences:

1. The accelerating increases in mean surface temperatures in the Arctic are already contributing to further global-scale climate system changes, including uncharacteristic fluctuations in the polar vortex that significantly influence extreme weather events at lower latitudes.
2. According to data from the FAO marine fisheries areas, 17.3 percent of the world's fish catch comes from Arctic and North Atlantic/Pacific waters, and downward landing trends in these regions have important implications for this vital global food source.
3. More maritime vessels are transiting to and across the Arctic Ocean to explore for oil/gas and other natural resources, conduct assessment and research missions, transport commercial commodities, and expand high-latitude tourism, all of which have consequences for socio-economic interests in the eight Arctic countries and increasingly also for dozens of other nations interested in the Arctic.
4. Much of the Arctic's melting land ice and glaciers ultimately flows into the sea, adding volume to the world's oceans. Well over one third of current global sea level rise is attributable to ice melt from the Arctic and only about 15 percent of ice melt comes from the Antarctic. These and other factors that are contributing to accelerating rates of sea level rise (such as thermal expansion from

rising ocean temperatures) pose profound threats to human lives and infrastructure, especially in vulnerable and densely populated coastal areas. For example, recent studies conclude that upwards of 200 million people are currently living on land that will potentially be below sea level or will be vulnerable to increased flooding by the end of the century. The same study concluded that the amount of sea level rise—and the number of humans affected—could be significantly higher.

5. The scientific consensus, derived from multiple, independent computer models of future conditions, is that a significant weakening of the Gulf Stream circulation is expected by the end of this century, which is likely to have measurable impacts on global ocean circulation and climate patterns.
6. Weather in the Northern Hemisphere is strongly influenced by the polar jet stream, including shifts in cold air masses from the Arctic moving further south and warmer air masses from the tropics moving further north. These new weather patterns are producing unprecedented high local temperatures and, conversely, uncharacteristically low local temperatures. These climate changes also produce more severe droughts and flooding, as well as an increase in wildfires, lost crops, and potable water shortages.
7. Growing interest in the Arctic is spurring significant socio-economic activity among the eight Arctic Council countries and beyond. This flux of new industries/businesses and multinational geopolitical cultures, innovative ideas, and opportunities from all over the world affects the Arctic's many Indigenous cultures and communities.

What is emerging is a "New Arctic" that is functionally operating in a dramatically changed—and rapidly changing—world order. This New Arctic is a direct consequence of unprecedented changes in the global climate system and concurrent transformations in the geopolitical world, all of which further drive changes in the Arctic, which in turn have global consequences. Transformations occurring in this 21st century world differ markedly from previous centuries, both in the pace of change and their global impacts. First, the scale of changes in this New Arctic presents a new and shifting reality, with global reach. Second, these rapid changes provide new venues and opportunities that affect the interests of Arctic coastal nations and high-north businesses and governance.

Finally, a new international multi-decadal-scale agenda is emerging that increasingly focuses on four major changes, with international and domestic consequences: climate change, global and Arctic regional socio-economic change, challenges that affect human and societal well-being, and geopolitical realities.

It is in these contexts that NPAC 2019 provided a venue to explore, in some detail, the relevant socio-economic policies and national development strategies and to give voice to new ideas and constructs for the Arctic region, which increasingly connects to and affects global affairs. The conference provided an opportunity for expert presentations and informal dialogue among knowledgeable individuals on emerging Arctic issues and policy responses. We were particularly pleased to have a significant presence from government policymakers and young analysts as well as Indigenous leaders. While most Arctic forums and websites focus on specific issues, NPAC 2019 sought to provide a more holistic approach for Asia-Pacific states to consider a range of Arctic activities.

We would like to thank the following for coordinating the conference and preparing this volume for publication: Yoon Hyung Kim, Chair of the NPAC Steering Committee, Professor Emeritus at the Hankuk University of Foreign Studies and Senior Fellow at the East-West Center; Robert W. Corell, Principal, Global Environment and Technology Foundation and its Center for Energy and Climate Solutions, United States and Professor at the University of the Arctic, Norway; Jong Deog Kim, Vice President for Research at the Korea Maritime Institute, Republic of Korea; Arild Moe, Research Professor, Fridtjof Nansen Institute; Charles E. Morrison, Adjunct Senior Fellow and former President of the East-West Center; David L. VanderZwaag, Professor of Law and the Canada Research Chair (Tier 1) in Ocean Law and Governance, Dalhousie University; and Oran R. Young, Professor Emeritus at the Bren School of Environmental Science and Management, University of California, Santa Barbara.

We also thank the members of the NPAC Steering Committee for their continued work on behalf of the NPAC Program. Most importantly, we wish to thank the program panelists for their papers, the commentators, and all the other participants involved in contributing to the success of this conference. We extend our appreciation to Daniel Glick, our copyeditor, for his excellent contribution in preparing the text for publication. We are grateful to Nancy Lewis at the East-West Center for her support of the NPAC program. Our sincere gratitude goes to Jaymen Laupola and the

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Young-Tae Chang	Richard R. Vuylsteke
President	President
Korea Maritime Institute	East-West Center

EXECUTIVE SUMMARY

Overview: Global-Arctic Interactions—The Arctic Moves from Periphery to Center[1]

Yoon Hyung Kim, Oran R. Young, Robert W. Corell, Jong Deog Kim, Arild Moe, Charles E. Morrison, and David L. VanderZwaag

INTRODUCTION

Unprecedented changes in the global climate system are transforming the planet as we move deeper into the 21st century. Nowhere are the effects of climate change more far-reaching and profound than in the Arctic, which is warming twice as fast as the global average. Feedback effects expand the existing links between the Arctic and the rest of the global system. Not only are Arctic biophysical responses contributing to the acceleration of climate change globally, but increased accessibility to the Arctic is also driving new efforts to exploit the region's stores of natural resources—including oil and gas—and making the region a domain of increasing interest from a geopolitical perspective.

The result is what we call the "Arctic Paradox." Climate change is creating conditions conducive to the extraction and shipment to southern markets of the Arctic's large reserves of oil and natural gas. But the combustion of hydrocarbons to serve the energy needs of modern industrial societies leads to the emission of greenhouse gases and, as a result, contributes to the acceleration of climate change. Finding ways to come to terms with this paradox must rank as the top priority for all those interested in the future of the Arctic.

Prominent examples of the impacts of climate change in the Arctic include but are not limited to: a dramatic rise in temperatures in the higher latitudes and the ensuing impact on the polar vortex; the thinning and recession of sea ice in the Arctic Basin; the acidification of Arctic waters; rapid increases in the loss of ice from the Greenland ice sheet; and the accelerated melting of permafrost. These impacts are increasing access to Arctic resources. But they are also generating problems for residents of the Arctic, such as coastal erosion, damage to transportation systems, and destabilization of structures built in areas where permafrost has historically

been present. Some communities have already been forced to relocate, and Indigenous Peoples from around the Arctic have experienced ecological disruptions that are profoundly altering centuries-old cultures.

The impacts of climate change in the Arctic are not limited to the high latitudes, since climate change in the Arctic has important consequences for Earth's climate system. The recession of sea ice is triggering feedback mechanisms that will accelerate increases in global temperatures. For example, the resultant lowering of the Arctic's albedo when white sea ice melts into dark blue open water increases the absorption of solar radiation. The melting of permafrost may release large quantities of methane now locked in frozen ground and in methane clathrates in shallow coastal waters. Dramatic changes in weather patterns in the lower latitudes are expected due to alterations in the jet stream, and the accelerating methane emissions have both a short- and long-term potential to trigger additional warming. As a result, intense interest in the Arctic is increasingly central to debates over and assessments of global environmental change.

One significant consequence of climate change in the Arctic is the increased accessibility of the Arctic's natural resources, including not only hydrocarbons but also other minerals (e.g. lead, zinc, iron ore, diamonds, and rare earths). This has stimulated increased corporate interest in the extraction of Arctic resources and renewed interest in Arctic shipping (especially shipping of hydrocarbons along Russia's Northern Sea Route). Visions of tapping the region's natural resources have driven decisions by companies outside the Arctic to invest in extractive projects (the most notable being investments in Yamal natural gas production by France's Total, China's CNPC, and China's Silk Road Fund) and in the construction of a new generation of ice-breaking LNG tankers in the shipyards of Korea specially designed to transport natural gas from the new port of Sabetta located on Russia's Yamal Peninsula. At the same time, the financial attractiveness of these resources is affected by fluctuations in world market prices for natural resources, political developments in key states, technological innovations, and global agreements that may lead to profound shifts in the role of fossil fuels in the global economy.

As the Cold War receded, the Arctic emerged as an international zone of peaceful cooperation where issues of environmental protection and sustainable development took precedence over conventional security concerns. Recent years, and especially the period following Russia's annexation of Crimea in 2014, however, have brought an intensification of

conflict between Russia and the West. An important question involves the extent to which this renewed conflict will spill over into the Arctic, leading to rapid remilitarization and a general securitization of Arctic affairs. More generally, the pursuit of great power aspirations on the part of Russia and the emergence of China as a global power have put an end to the vision of the Arctic as a peripheral region in which the principal concerns center on enhancing opportunities to cooperate in matters of environmental protection and sustainable development. Today, the Arctic is both a high-impact zone for global forces (such as the impacts of climate change) and an arena for the pursuit of geopolitical objectives (such as the interplay among China, Russia, and the U.S. in a shifting global order). This makes it important to ask whether the Arctic can remain a zone of peace in which leading countries are able not only to address Arctic issues in a cooperative spirit, but can also make use of Arctic forums to engage in constructive informal contacts that may be helpful in addressing issues arising in other regions.

Underlying this merging of regional and global agendas is a series of global developments suggesting that we are moving into an era in which conventional perspectives on world affairs are no longer adequate as organizing principles for thinking productively about Global-Arctic interactions. Partly, this is a matter of the impacts of the Great Acceleration leading to a new era we now think of as the Anthropocene. With this new era has come increased concern about the danger of transgressing planetary boundaries and unleashing an uncontrolled experiment on the planet's major systems. Undoubtedly, the most prominent case is climate change.

There are good reasons to regard the impacts of climate change in the Arctic as harbingers of disruptive impacts of climate change that lie in store for areas in the mid-latitudes in the not too distant future. While the most recent report from the Intergovernmental Panel on Climate Change documents the likely impacts of temperature increases as small as 0.5°C, the Arctic is now providing graphic evidence regarding the consequences of far more dramatic increases in surface temperatures—since it has already exceeded that 0.5°C threshold of change.

The merging of regional and global agendas is also associated with advances in information and communication technologies, giving rise to developments we now characterize as the "Fourth Industrial Revolution": the global digital revolution combined with new issues in the realm of cybersecurity. Just as the Arctic's natural resources and shipping routes are

becoming more accessible, we may be moving toward a post-industrial world in which these conventional sources of value are of declining importance. At the same time, these developments will increase the importance of virtual reality, making the long distances and low population density of the Arctic less significant. Similarly, the development of increasingly sophisticated capabilities to engage in cyber-aggression/warfare may reduce radically the value of existing military systems and alter the way we think about the distribution of power in international society. Uncertainty is a critical feature of the increasingly complex world brought about by these developments. But any effort to think systematically about Global-Arctic interactions must take into account the prospect of radical changes in economic and political systems that call into question many of the assumptions we make habitually about the character of the prevailing global order.

An important issue arising from these developments concerns the adequacy of the existing system of governance arrangements for the Arctic. Centered on the Arctic Council as the primary intergovernmental forum for discussing Arctic affairs, the architecture of these arrangements reflects conditions that prevailed in the 1990s. Since then, incremental efforts to supplement these arrangements have resulted in piecemeal innovations, including the creation of the Arctic Economic Council, the Arctic Coast Guard Forum, and the Arctic Offshore Regulators Forum, as well as initiatives unrelated to the Arctic Council such as the assemblies of science ministers interested in the Arctic. There is broad agreement that the Arctic Council has performed well over the last 25 years. Nevertheless, it is important to ask whether this collection of arrangements is capable of addressing the range of issues coming into focus now as a consequence of the merging of Arctic and global agendas. We need to think creatively about options for adjusting or restructuring the Arctic governance system to address the range of concerns arising from this merger.

It is in these contexts that NPAC 2019 provided a venue to explore the relevant socio-economic policies and national development strategies and to give voice to new ideas and constructs for an Arctic region that is more integrally connected to and affects a wider range of global affairs. To set the stage for this effort, the conference began with a presentation by a prominent expert who detailed changes in the global climate system and their implications for the Arctic. Individual sessions that followed focused on six substantive themes. The body of this volume is organized in six parts

dealing with these themes in turn.

Part I consists of policy perspectives concerning Global-Arctic Interactions, which highlight Korea's national Arctic policy priorities along with expert reflections on the Arctic policies of Canada, Iceland, Russia, and the United States, as well as the perspectives of an early career researcher. Part II explores the interplay of various dimensions of Arctic transformation as they play out in Greenland, the only true Arctic nation (in contrast with states that include Arctic territory but whose geographic and political centers of gravity lie farther to the south). Part III addresses recent developments in four areas of Arctic maritime governance, which can be seen as part of an Arctic regime complex nested within the United Nations Convention on the Law of the Sea (UNCLOS). Part IV outlines Russia's Yamal region LNG development as a case study that highlights commercial, technological, environmental, and political issues that stem from the socio-economic development in this region of the Russian Arctic, a major factor in Russia's economic and geopolitical future. Part V explores the state of scientific knowledge and the political response regarding the numerous pollutants of concern in the Arctic, including persistent organic pollutants (POPs), heavy metals, radionuclides, heavy fuel oils, black carbon, and methane. Part VI assesses the interests of non-Arctic states in Arctic issues, including those arising in the Arctic Council, as well as the responsibilities of these states for the impacts of global forces (e.g. climate change) on the Arctic.

SETTING THE STAGE: GLOBAL CLIMATE CHANGE AND THE ARCTIC

Unprecedented changes in the global climate system are spurring transformative consequences for the planet—and increasingly visible impacts in the Arctic and beyond. It is increasingly clear that global and Arctic regional trends and patterns of change will be substantively different from the past decades. First and foremost, the past 10,000 years until the industrial age was the most stable interglacial period. During this period, global mean surface temperatures varied by less than +/- 0.7°C. However, the current global mean surface temperature is now about 1°C over the pre-industrial level, and the mean circumpolar Arctic surface temperature is about 2°C to 2.5°C over that level.

During the Eemian interglacial, about 125,000 years ago, the global mean annual surface temperatures were warmer than pre-industrial levels by about 1°C to 2°C and the Arctic surface temperatures were at least 2°C warmer than present. It is now clear that the current interglacial period is experiencing accelerating warming, due largely to the effects of the Industrial Revolution—from 1750 onward—and the concurrent rise in fossil fuel energy use over the past two and a half centuries. Global fossil CO_2 emissions have increased from about two million metric tonnes in 1750 to more than 37 Gigatonnes (Gt) by 2019. Carbon dioxide concentrations are currently at about 415 ppm, which is higher than at any time in more than 800,000 years. As reported by the Intergovernmental Panel on Climate Change (IPCC), anthropogenic emissions account for about 70 percent of the changes in the climate system. Approximately 30 percent is attributable to natural variability.

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Projections regarding the character and importance that these changes will provoke in the Arctic region over the next few decades are now emerging to have global consequences:

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2. According to data from the FAO marine fisheries areas, 17.3 percent of the world's fish catch comes from Arctic and North Atlantic/Pacific waters, and downward landing trends in these regions have important implications for this vital global food source.
3. More maritime vessels are transiting to and across the Arctic Ocean to explore for oil/gas and other natural resources, conduct assessment and research missions, transport commercial commodities, and expand high-latitude tourism, all of which have consequences for socio-economic interests in the eight Arctic countries and increasingly also for dozens of other nations interested in the Arctic.
4. Much of the Arctic's melting land ice and glaciers ultimately flows into the sea, adding volume to the world's oceans. Well over one

third current global sea level rise is attributable to ice melt from the Arctic and only about 15 percent of ice melt comes from the Antarctic. These and other factors that are contributing to accelerating rates of sea level rise (such as thermal expansion from rising ocean temperatures) pose profound threats to human lives and infrastructure, especially in vulnerable and densely populated coastal areas. For example, recent studies conclude that upwards of 200 million people are currently living on land that will potentially be below sea level or will be vulnerable to increased flooding by the end of the century. The same study concluded that the amount of sea level rise—and the number of humans affected—could be significantly higher.

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6. Weather in the Northern Hemisphere is strongly influenced by the polar jet stream, including shifts in cold air masses from the Arctic moving further south and warmer air masses from the tropics moving further north. These new weather patterns are producing unprecedented high local temperatures and, conversely, uncharacteristically low local temperatures. These climate changes also produce more severe droughts and flooding, as well as an increase in wildfires, lost crops, and potable water shortages.
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What is emerging is a "New Arctic" that is functionally operating in a dramatically changed—and rapidly changing—world order. This New Arctic is a direct consequence of unprecedented changes in the global climate system and concurrent transformations in the geopolitical world, all of which further drive changes in the Arctic, which in turn have global consequences. Transformations occurring in this 21st century world differ

markedly from previous centuries, both in the pace of change and their global impacts. The scale of changes in the New Arctic presents a new and shifting reality with global reach. These rapid changes provide new venues and opportunities that affect the interests of Arctic coastal nations and high north businesses and governance.

As the World Economic Forum posits, "We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before and the transforming will affect the socio-economics of nations, challenges to established cultures, and the governance at all levels and the fundamental well-being of peoples and societies around the world."

PART I: POLICY DIALOGUE ON GLOBAL-ARCTIC INTERACTIONS

Part I on Arctic policies provides a rich array of information on the importance of and the emerging policy perspectives from the current Chair of the Arctic Council, as well as policy perspectives from states with comprehensive interests in the Arctic region. It provides an overview of the key issues emerging in Arctic policies among nations that are likely to govern the future of the region. It has been clear that the Arctic Council is an increasingly essential intergovernmental forum to "*promote cooperation, coordination and interaction among the Arctic States, Arctic Indigenous communities and other Arctic inhabitants on common Arctic issues, in particular on issues of sustainable development and environmental protection in the Arctic*," all in a context where Arctic issues are no longer regional matters, but now operate on the main stage of global affairs.

The discussion focused, somewhat surprisingly, on:

- whether there is a "pause" in international cooperation, in part generated by a breakdown in consensus about the regional and global significance of changes in the Arctic;
- disconnects between among governments (particularly in the Arctic Council), business communities, and scientists; and
- the communication of information on critical Arctic issues to various publics.

In contrast to the opening depiction of the rising climate emergency, the policy session had a "business as usual" quality, focusing on ongoing issues with little recognition of the looming threat of disruption associated with climate change. Some participants found this disconnect disturbing; others thought it demonstrated a need to search for new venues for actions, including local communities, networks, and the general public.

Participants spoke of several notable instances reflecting a pause or backsliding in Arctic cooperation, such as the unprecedented lack of an agreed-upon joint Ministerial Declaration for the May 2019 Arctic Council ministerial meeting. Further, the words "climate change" disappeared from the most recent statement of U.S. Arctic policy, and political problems emerged in the United States-Russia relationship in intergovernmental institutions such as the Arctic Coast Guard Forum. Finally, it was observed that an initiative of the Barack Obama administration to develop a strategic plan for the Council continues to languish because of U.S. personnel changes and the absence of political consensus on the value of multilateral organizations, making it impossible to move forward significantly. It was observed that these are counter trends in the Arctic Council's goal to foster sustainable development and environmental protection for the Arctic region.

A government representative noted that one aspect of the Arctic's movement "from periphery to center" has been the increasing politicization of Arctic issues, especially at higher levels and over climate change. One of the most important climate change achievements of the Arctic Council was the 2004 Arctic Climate Impact Assessment (ACIA). However it was posited that today, any effort to update this assessment through the Council would be opposed by the United States. While some blamed the current U.S. administration, others pointed to a longer history; there has been a trend that one Arctic Council member or another has wanted to soft-pedal climate change. "Russia is not far behind the U.S. in this respect," a European participant pointed out.

It was also noted that climate change is an issue driven by forces external to the Arctic, so that the Arctic agenda is more about adaptation efforts in the Arctic than about mitigation programs, even though the permanent eight Arctic Council nations emit about 25 percent of global CO_2 emissions. With the official observers included, Arctic Council nations emit collectively over two thirds of global CO_2 emissions (2019 data from the International Energy Agency). In fact, much of the Arctic space

is regulated by national and bi-lateral agreements, and where it is not, requires global action including more than 20 agreements affecting the Arctic region, such as UNCLOS, the IMO's International Code for Ships Operating in Polar Waters (Polar Code) and the Convention on Long-range Transboundary Air Pollution. Nationally determined commitments to address climate change are more appropriately addressed in the Paris process and similar efforts by the United Nations Framework Convention on Climate Change (UNFCCC). It was noted that much of the Arctic Council's work is carried out in the AC's six official Working Groups and numerous Task Forces and Expert Groups, all of which have continued to function effectively. There may not have been a ministerial declaration in 2019, but the Senior Arctic Officials' report to the ministers was accepted without dissent, and this document includes a list of all the activities taking place within various Arctic Council bodies.

A number of participants felt, however, that the Arctic Council has not been as effective as a framework for communicating with various Arctic stakeholders as they would hope. An example cited involved the business community, where the Arctic Economic Council (AEC), a business-to-business organization and network, provides one venue where expectations have not been met. However, in May 2019, the Arctic Council and the Arctic Economic Council signed an MOU to facilitate future cooperation in areas of common interest and benefit to Arctic communities, which was the first such MOU signed by the Arctic Council. It was suggested that a series of MOUs might serve as a model that could allow the Arctic Council to become a linchpin or connecting hub of many Arctic activities, not all of which are government-centric. However, one business participant was skeptical of Arctic Council forums having any impact on, and thus interest for, business. We need something more substantial, he commented.

Another dimension, addressed at length by the 2019 NPAC, was the connection between Arctic Council members and the scientific community. While fissures may reflect the political nature and jurisdictional boundaries of the Council as opposed to the general consensus of the scientific community, it was noted that many scientists are engaged in one form or another in Arctic Council and related activities. These include the International Arctic Science Committee, as well as many informal means through which scientists can interact with Council governmental representatives. One scientist felt that there is plenty of room for a major scientific initiative in the Arctic that will connect with policy and with

society. While it may not be possible to launch an ACIA-II at this time, other issues involving human-environment interactions are ripe for sustained analysis.

With respect to Indigenous communities, a participant who had served in an elected office in a major Arctic subnational entity argued that the Arctic Council is a "top-down" organization that ignores local voices—and especially those belonging to Indigenous Peoples. There was also a complaint that representatives of the Russian Association of Indigenous Peoples of the North (RAIPON) are selected by the Russian government and may not be genuine Indigenous voices. It was also noted that Permanent Participants at the 2019 ministerial for the first time were not fully consulted about the final Ministerial Declaration. Concern was expressed that the reintroduction of high politics in the Arctic should not reduce the involvement of Indigenous Peoples or other nongovernmental stakeholders. Many participants saw these trends as issues that the Arctic Council will need to address and it was suggested that the participation of experts and officials from each of the 13 Official Observer nations of the Arctic Council could substantially enhance these opportunities for collaboration and international cooperation.

Others, however, commented that by the standards of most international governmental organizations, the Council appears to be a model of inclusivity and that issues relating to Russian Indigenous participation might be addressed by developing cooperative projects for Indigenous Peoples that can be owned by the Russian government.

The big question, of course, was whether progress in Arctic governance is keeping pace with a growing need for cooperation, driven especially by climate changes and new technologies. There was some review of the history of the Council, which drew inspiration from then-Soviet President Mikhail Gorbachev's Arctic Zone of Peace speech in Murmansk on October 1, 1987. Evolving out of that seminal speech was the endorsement by all eight Arctic nations in 1991 of the Arctic Environmental Protection Strategy (AEPS), followed by the creation in 1996 of the Arctic Council. This was seen as a major step forward in institutional cooperation, as was the creation of the International Arctic Science Committee, a body designed to facilitate international scientific cooperation and joint scientific research programs. One senior former official reminded us that the level of cooperation among Arctic nations and Arctic-interested nations today is substantially more than what occurred during the Cold War period.

Others, however, felt that the growing urgency to act demanded new venues. It was observed that, importantly, there is the view that the top-down approach will increasingly need to evolve toward an increase in bottom-up strategies for adaptations, innovations, and cooperation. The problem is that effective cooperation in areas such as climate change, marine resource conservation, and trans-border pollution will require more than local Arctic actions and the use of international venues from the Arctic Council to the other Arctic-interested intergovernmental bodies. Another participant suggested developing networks with organizations in areas like the Amazon Basin and the Himalayas to maximize regional voices in global venues. Another queried whether, in the absence of strong forward movement by the Arctic Council governments, "We in the NPAC" need to be the leaders who are promoting stronger action.

This led to the question of how to motivate and mobilize people through the use of social media, and especially how to bring Arctic information to global audiences so that it is not confined to "an Arctic bubble." Of course, social media provides a vehicle for communication. But some felt it can be dominated as easily by those against cooperation as by those for it. One participant stressed that whatever the medium, effective outreach, even in the face of daunting challenges, needs to have positive messages and encourage people.

In the end, it seemed to some during the discussions that it will be essential to encourage Arctic and Arctic-interested governments to be at the forefront for policymaking and actions affecting the Arctic. However, some national governments have underlying, different ways of thinking about the Arctic space. It was suggested, for example, that the United States and Canada tended to view the Arctic as a remote area of their countries to be exploited by some or conserved by others. However, Russia emphasizes economic development as its highest priority for the Arctic region, as it is seen as central to Russian national development and identity.

NPAC participants were particularly grateful to the Icelandic and South Korean Senior Arctic Officials for participating so effectively and conscientiously throughout the program. However, the participants seemed to feel that the discussions left considerable unease about the willingness of governmental and societal actors to take the challenge of cooperation in the Arctic seriously and to commit the resources needed to address this challenge effectively.

PART II: THE FUTURE OF GREENLAND—POLITICAL AND ECONOMIC IMPLICATIONS FOR THE ARCTIC

The Greenland discussion provided an opportunity to explore the interplay of various dimensions of Arctic transformation—economic globalization, resource development, socio-economic and community-life challenges, amplified climate change, and potentially renewed geopolitical rivalry—in the context of a particular geographical space. What is unique about Greenland is that it is the only true Arctic nation (as opposed to being merely a northern part of a nation).

Greenland's status as a nation, however, is itself in flux, as Greenland has been undergoing both nation-building and state-building processes. The former began in the mid-19th century, while state-building is a more recent phenomenon. In 1979, Greenland was granted a limited form of home-rule from the Kingdom of Denmark, and in 2009, the Self-Government Act provided for a high degree of autonomy as well as acknowledged nationhood and the Greenlanders' right to choose independence. Denmark provides an annual block grant of 3.8 billion KRR (about USD 570 million), and other support that adds up to about 5 billion KRR annually, or approximately USD 750 million, accounting for about a third of GDP and 60 percent of public expenditure.

Danish support is reduced whenever Greenland adds another self-government function, and will disappear if Greenland declares independence. It was pointed out that there are other forms of decolonization, such as "free association" and other forms of support, including trust funds, but Greenland's path was determined without reference to these.

The democratically elected parliament has 31 seats with multiple party representation. Various coalitions have governed over the past decade. The government of Greenland owns subsurface resources, and in the early years of self-government there was considerable optimism that the exploitation of oil and gas, uranium, and other minerals in large-scale projects might provide the basis for replacing the Danish block grant and financing independence.

Participants discussed Greenland's future political status, and there was some consensus. First, recent polls suggest that independence overwhelmingly remains an aspiration with no significant generational

differences. Secondly, however, it was agreed there is no special urgency because there is no near-term prospective substitute for the Danish subsidies so critical to Greenland's economy.

This is partly because none of the large-scale natural resource projects have taken off. Commodity prices fell, and costs of exploitation in Greenland are high. Moreover, despite what appeared to be a clear division of powers under the Self-Rule Act, there are gray areas and bureaucracy. Large-scale projects would also typically involve large numbers of foreign workers, and have environmental, health, and other consequences that have not been clearly studied or laid out, especially to the public.

It was suggested, and generally agreed, that Greenland's more immediate political and policy priorities lie with developing a more diversified local economy, meeting socio-economic challenges, and adapting to the environmental consequences of rapid climate change. One participant pointed out that although Greenlandic political parties differ on resource extraction issues, there is wide agreement on educational and health agendas.

It was clear from the papers and discussion that Greenlandic communities are facing enormous challenges as a result of impacts from globalization, urbanization, and climate change. In the northwest, for example, climate change has made some traditional hunting practices dangerous and uneconomic. On the positive side, there are also considerable adaptation efforts that include, for example, emphasizing fishing (by far Greenland's largest export) over hunting.

Education and children's livelihoods are critical. Whether or not the nation moves further ahead on independence, Greenland requires the human resources needed for effective self-governance and global engagement. It was noted that Greenland's resident population has plateaued, in part because of significant out-migration, especially to Denmark. However, emigrating young people often have a difficult time finding employment and fitting in to Danish society, resulting in poverty or dependencies.

There may be a basis for a more diversified economy. While earlier excitement in large-scale projects has largely evaporated, there are small-scale mining and other activities either already underway or proposed. There is also more potential for tourism, one reason that the Greenlandic government has sought more international gateway airports. Climate change has provided the basis for other new niche activities, including the

export of sand and gravel and of drinking water.

Greenland faces both challenges and possibly advantages because of enhanced strategic competition globally and in the Arctic. Chinese economic interests are relatively new to the island, accounting for about 10 percent of FDI today but potentially more in the future. As if to underscore the rise of geopolitical competition, the first reports of U.S. President Donald Trump's interest in purchasing Greenland became public exactly at the time of the 2019 NPAC session. Because of its evolving political status, Greenland, unlike other Arctic areas, is viewed as potentially contestable territory, despite the American Thule Base in northwest Greenland and its security protection through NATO.

As one participant noted, the perception of Greenland within the international system should be within an evolving multilateral framework rather than just a bilateral Greenland-Denmark context. The United States is obviously a player, but so too may be China, Russia, and the EU. This may enhance Greenland's leverage, as indeed it did successfully in the case of its new airports.

From the outside, the rapid melt of its icecap and other associated climatic changes are the most stunning and disturbing elements in Greenland. These are less reported internally where human concerns have greater salience. But they add to the enormous challenges Greenlandic society faces in a rapidly changing world.

PART III: MARITIME GOVERNANCE IN THE ARCTIC

Important developments have recently taken place in four areas of Arctic maritime governance: determination of outer continental shelf boundaries, fisheries in the Central Arctic Ocean, adoption of an international code for ships operating in polar waters, and negotiations on a treaty protecting biodiversity in areas beyond national jurisdiction.

The ongoing process of determining extended continental shelf boundaries in the Arctic Ocean involves delimitation of an international seabed area beyond national jurisdiction in the Central Arctic Ocean. Importantly, it also involves resolving overlapping claims among Russia, Denmark/Greenland, and Canada (Norway's claim is the only one confirmed in the Arctic). Some have expressed fear that this disagreement may become a source of conflict. It is difficult to see that conflict is a

realistic scenario, however. The process is time consuming, and all the parties have declared their commitment to an orderly settlement of overlapping claims. There is some uncertainty about which role the technical body established by UNCLOS—the Commission on the Limits of the Continental Shelf—will play. Its task is to check the geological validity of claims. Nevertheless, it may also come to play an important role in resolving overlapping claims if in its response to submitted documentation of claims it provides recommendations that are helpful for the involved states. A complicating factor in the process is that the United States has not ratified UNCLOS. The U.S. adheres to customary international law, which to a large extent corresponds to UNCLOS, but it has no obligation, or possibility, to apply to the Commission for recommendations—and whether it could apply remains doubtful. This can make it harder to reach an agreement with the other claimants.

States that do not have a continental shelf in the Arctic Ocean will also be affected by the delimitation of extended shelves, since it will determine the size of the international seabed area where non-Arctic actors will have equal access to possible mineral riches, in accordance with the rules set out by UNCLOS. There are no imminent plans for mineral exploration in this area, however.

Governance of possible fisheries was brought a significant step further with the Agreement to Prevent Unregulated Commercial Fishing on the High Seas of the Central Arctic Ocean (CAOF Agreement), signed in 2018 by the five Arctic coastal states, four other major fishing nations, and the European Union. The CAOF Agreement is a regional agreement regulating the unique Arctic fishery resources and their environment in accordance with the high seas responsibilities outlined in the UNCLOS, thereby strengthening the high seas regime within the convention.

The CAOF Agreement is based on the precautionary approach, since little is known about the potential for future fisheries in this area. But whereas there has been broad agreement on the principle, actual implementation may face challenges. There may be boundary issues with regional arrangements, disagreement on the volume and form of exploratory fishing allowed, uncertainty about the entrance of new parties to the agreement, as well as dealing with non-parties that may start activities in the area. There is also uncertainty about decision-making procedures within the agreement. Science and scientific exchange played an important role in the negotiations over the agreement. Continued scientific

cooperation will also be crucial in the implementation stage and it has been recommended to establish a scientific coordinating body or committee.

Another potentially important element in Arctic maritime governance is the effort to negotiate a treaty for protection of biodiversity in areas beyond national jurisdiction (BBNJ). The negotiations are global, they do not have a specific Arctic focus, and they are ongoing. In the process, a conflict dimension between developing and industrialised countries has become visible. Two fundamental principles—the common heritage of mankind and the freedom of the high seas—are given different weight in these two groups of countries. An area of special interest in the Arctic is the potential of Marine Genetic Resources (MGRs). The negotiations will decide which principles and sets of rules will govern the exploitation of newly valued MGRs. They will also identify to what extent technologically developed maritime states are willing to build capacity in developing states and to what degree there ought to be a global sharing of benefits of resources, as well as how area-based management tools in places outside national jurisdiction can be implemented. It is uncertain how strong such a treaty could become. Some states, primarily developing nations, support a strong treaty. Developed countries emphasize less coercion and refer to the existing regulatory bodies. To reach consensus more time may be needed than the original deadline of spring 2020.

The Polar Code entered into force in 2017. It was essential to adopt a code and get implementation underway, but this speed meant that several issues were not sufficiently covered. The Code uses a goal-based approach for risk mitigation of safety aspects, which is different from the more traditional prescriptive approach in the part covering pollution. The portions of the agreement that define safety procedures cause the largest implementation challenges. A goal-based approach means that ship owners and ship-building companies determine the best methods and technologies to reach safety goals. This gives them flexibility and ensures that technological advances are utilized, but critics note that the Code does not have a robust system to check compliance. There is also a need for a clearer definition of concepts, such as ship categories, which again is a prerequisite for consistent implementation. A major outstanding issue is whether to include ships presently not covered by the code; in particular, fishing vessels and pleasure craft. Another important concern is enforcement. Will ships be detained in ports if authorities believe regulations are likely to be broken, given the voyage plan, or will rules only function to establish liability after

an accident has occurred?

On the environmental side, such issues as heavy fuel oil, black carbon, and underwater noise are outstanding. There is considerable disagreement among states about the desirability of stricter regulations. A major split is between Russia, the country with the highest shipping activity in the Arctic, and other states with little Arctic shipping. Russia fears that more stringent environmental standards will lead to higher operational costs that threaten the economic viability of its projects.

PART IV: THE POLITICAL ECONOMY OF ARCTIC RESOURCE DEVELOPMENT AND MARITIME LOGISTICS—THE CASE OF YAMAL LNG

Part IV outlined Russia's Yamal region LNG development as a prominent case study that highlights commercial, technological, environmental, and political issues about socio-economic development in this region of the Russian Arctic, which is a centerpiece of Russia's economic and geopolitical future. The development of Russia's Yamal LNG project is remarkable. Novatek, Russia's state-owned gas supplier, was able to achieve what many other more experienced IOCs could not: a successful project in a particularly harsh and remote environment, the northeastern Arctic part of the Yamal peninsula (in Russia's Yamalo-Nenets Autonomous Okrug).

As one Russian participant put it, Novatek is "very tough and greedy," and is looking at every opportunity to save or earn money. They have very strict financial discipline and monitoring of project implementation schedules. Novatek's long-term strategy necessitated that the company move to the Arctic, where it had leases in Yamal for potential export markets, and not continue to stay solely with existing markets. The company, however, did not have any regional pipeline leases and would have to design and rely on an Arctic marine transportation system to service its production facilities on the Yamal Peninsula. The associated marine transportation system has evolved into a maritime hub for Russia's national Arctic waterway, the Northern Sea Route (NSR). These regional LNG developments connect Russia's Arctic to Europe and Northeast Asia with a new marine transportation system using advanced, icebreaking ships on destinational (i.e. export from the Arctic, as opposed to transit through the Arctic) voyages.

The development of the Russian Arctic is a national priority and the NSR, Russia's national Arctic waterway, is of personal interest to President Vladimir Putin. Novatek has gained significant favor within the Russian government because it has delivered Yamal LNG on time and on budget, and has significantly increased traffic on the NSR. Yamal LNG on the Yamal Peninsula has become an anchor and central maritime hub for the NSR and enjoys substantial financial and fiscal support from President Putin and government ministries. Its success enhances Russia's leadership in the Arctic, strengthens Russia's influence in the Asia-Pacific region, and opens new markets for its Arctic natural resources. The developments in Yamal LNG play key roles in Russia's near-term economic health and contribute to an increasing "Arctic share" of Russia's GDP. These attributes confirm that Novatek will develop Arctic LNG 2 in the near term, and Arctic LNG 1& 3 in the longer term, using public-private partnerships and foreign investment to support its growth strategy within the Arctic region. It is significant to note that Yamal LNG and the associated expansion projects (Arctic 1,2,3) represent one of the largest and successful ongoing natural resource developments in the Arctic.

Participants also discussed several challenges facing the development of Yamal LNG as the result of external sanctions and domestic competition. Further development will require new and leading technologies that are not on any U.S. or European sanctions lists. For example, Novatek is developing the Arctic Cascade Process for liquefaction, and plans to use it for Arctic LNG expansion projects. In addition, foreign investments were secured from France's TOTAL, and the China National Petroleum Company (CNPC) and Silk Road Fund (TOTAL and CNPC each have a 20 percent share in Yamal LNG and the Silk Road a 9.9 percent share). In June 2019, Mitsui and JOGMEC (Japan Oil, Gas, Metals, National Corporation) agreed to buy a 10 percent share in Novatek's Arctic LNG 2 complex (approximately a USD 3 billion invesment) and joined TOTAL, CNPC and CNOOC (China National Offshore Oil Corporation) as key foreign investors in this expanded Russian Arctic LNG venture. Arctic 2 made a final investment decision in fall 2019. The biggest challenge for hydrocarbon projects is securing downstream markets. Large-scale participation with partners that can provide market access in Asia (and in particular China) becomes critically important. Participants also discussed larger domestic political challenges facing Novatek in competing with Gazprom (majority-owned by the Russian government) and in potential

disputes with Rosneft (an enterprise that is an integrated energy company).

Speaking from a global hydrocarbon markets perspective, one participant made it clear that there is room for Yamal LNG in both global gas and LNG markets. However, global oil prices face a "bumpy ride" in the next decade, with weak demand and a glut of U.S. shale oil undermining price. This uncertainty makes Russian Arctic offshore oil development an economically risky strategy. However, onshore Russian Arctic oil development remains more promising. A long-term stable LNG price of $6-8/MMBtu will keep Yamal LNG competitive in the global natural gas market. From a global perspective, Asia still dominates and drives the global gas market; LNG imports are required in many Asian countries (including China) due to increasing power needs and the lack of domestically produced gas. This bodes well for Russian Arctic LNG projects. Projections indicate that Arctic LNG 2 can produce at a rate 30 percent cheaper than Yamal LNG and maintain a price under $6/MMBtu, a very competitive long-term price in global markets.

With regard to the potential military aspects of Yamal LNG and the NSR, one Russian participant pointed out that there is little relationship between the Yamal development and the renewal of Russian national security interests in the Arctic. There is no competition for *space* between the security and economic interests in the region. Naval activity in the region and along the NSR is seasonal. The relevant competition between these two national interests is for public funds. However, the Yamal LNG developments have not been at the expense of defense funding; for example, dredging of Utrenniy, where a terminal for Arctic LNG-2 will be erected with support from federal funds, competes for monies allocated for general Arctic infrastructure development, including new icebreakers. There is no competition for icebreakers, as the Russian Navy is now receiving more modest icebreakers to support its summer operations. The Russian nuclear icebreaker fleet, now operated by Rosatomflot, could always be used for forging marine access, and supporting sovereignty and security operations at any time as a national maritime asset.

Discussion continued about environmental and Indigenous concerns related to the development of Yamal LNG. One Russian participant remarked that there have certainly been reductions in the fish populations in Ob Bay due to the extensive dredging. Also, land for the project has been withdrawn from use as Nenets reindeer pastures. But several benefits from the LNG development have also been recognized by local residents, such as

better access to medical care and schools, and mobile phone connections in the villages.

What is the Chinese perspective on Arctic commercial shipping along the NSR? As one Chinese participant put it, three distinct Chinese roles are envisioned in the Russian maritime Arctic: (i) conducting exploratory voyages for the commercialization of the NSR (COSCO Shipping has already completed 22 voyages since 2013 through the NSR); (ii) serving as a safe and efficient operator of LNG icebreaking carriers on routes to Europe and Asia; and (iii) becoming an active investor in the infrastructure requirements of the NSR, including trans-shipment ports for LNG.

Not surprisingly, the recent military buildup in the Russian Arctic has caused some apprehension in China. An additional concern is the legal status of the NSR, as Russia has declared straits used for international navigations as internal waters. Lack of marine infrastructure continues to be a limitation along the NSR and Chinese shipping companies will likely become more active investors in new projects. Multilateral cooperative approaches among shipping companies is a way for China to move forward in the Russian Arctic. A good example is the June 2019 signing of an agreement among COSCO Shipping, Sovcomflot, Novatek and the Silk Road Fund to establish a long-term partnership to facilitate destinational and trans-Arctic navigation along the NSR.

As the Fourth Industrial Revolution gathers pace, one participant provided a case study of the Arctic LNG 2 project located across Ob Gulf on the Gydan Peninsula. There, construction costs can feasibly save one third of the expenses compared with the Yamal project with the construction of a Gravity Based System, an LNG plant constructed offshore. The Arctic LNG 2 development will be most economically viable using trans-shipment ports in Kamchatka and Murmansk. The overall strategy for employment of 4th Industrial Revolution technologies in the Russian Arctic is to more efficiently link the Siberian rivers to the Arctic Ocean coast and the NSR. For an autonomous ship operating in/out of the Arctic LNG 2 site, two options are being considered: first-degree ships (ships with automated process and decision support and mariners aboard for operation), and, second-degree ships (remotely controlled ships with a mariner aboard). Both options show considerable costs savings: although more autonomous ships require higher capital expenses, operational costs are significantly reduced.

Another participant stressed several technical challenges involved in

developing a marine transportation system for Yamal LNG. He noted that the LNG icebreaking carriers for this project are very specialized ships and are very expensive. They are designed to operate independently in ice without icebreaker support and can be escorted by icebreakers when ice conditions are more difficult. The initial 15 LNG carriers using Finnish technology and built by Korea's Daewoo Shipbuilding & Marine Engineering are designed for dedicated trade on destinational routes to and from Yamal (Sabetta) to global markets. These are not ships designed for year-round trans-Arctic navigation across the NSR between Atlantic and Pacific oceans. Their operational challenge is to move Yamal LNG out of the Russian Arctic westbound to Europe year-round and eastbound to the Pacific/Asia during the summer and autumn seasons. It is noted that these new LNG icebreaking carriers are more expensive and less economical to operate in open water, so the need for trans-shipment ports, perhaps in Murmansk and in Kamchaka, is paramount.

PART V: PREVENTING AND CONTROLLING POLLUTION IN THE ARCTIC

Part V explored some of the major pollution concerns in the Arctic and the adequacy of global, regional and national responses. While most pollution in the Arctic emanates largely from outside the region (specifically persistent organic pollutants (POPs), mercury, plastics and black carbon), the need to prevent and control vessel-source emissions and discharges within the Arctic has gained growing attention due to the prospects of increased Arctic shipping.

One participant provided an overview of global and regional approaches/challenges in addressing long-range pollutants in the Arctic with a focus on POPs and mercury. As for future directions to better address POPs and mercury, the participant emphasized the need to move from the reactive approach of managing POPs under the 2001 Stockholm Convention towards a more proactive and precautionary approach such as that followed by the EU, where chemicals without toxicity data are not allowed on the market. Two research priorities were identified for mercury: improving understanding of Arctic climate change on mercury geochemical cycling; and getting a grip on the range of socioeconomic consequences of global mercury emissions in the Arctic.

Another participant described the rather complicated pollution prevention and control provisions of the International Maritime Organization's (IMO) *International Code for Ships Operating in Polar Waters* (Polar Code) and the major advances in controlling discharges of oil, noxious liquid substances, sewage, and garbage. He noted how the IMO has proposed a ban on heavy fuel oil (HFO) use and carriage for use as fuel in the Arctic, and is also considering how to control black carbon emissions from shipping. He then reviewed how the PAME Working Group of the Arctic Council has made major efforts to address safe and clean shipping in the Arctic. Those efforts include PAME's 2009 Arctic Marine Shipping Assessment, numerous studies on HFO use and mitigation measures in the Arctic, the development of a regional waste reception facilities approach in the Arctic, and the establishment of the Arctic Shipping Best Practice Information Forum to assist with harmonized implementation of the Polar Code.

Participants also discussed plastic pollution and microplastics in the Arctic. One participant reviewed the major findings from PAME's 2019 *Desktop Study on Marine Litter including Microplastic in the Arctic*, which identified numerous informational gaps but noted the reality that much of the plastic pollution is being carried by wind and ocean currents from outside the region into the Arctic Ocean with the north-eastern Atlantic sector having an especially heavy plastic load. The participant then summarized the fragmented array of global and regional responses to plastic pollution to date and highlighted the efforts of the UN Environment Assembly to address plastic pollution with an Ad-Hoc Open-Ended Expert Group tasked with proposing options to combat plastic litter and microplastics.

Session V also addressed Arctic Council responses to land-based and air pollution. One participant emphasized the limited effectiveness of the Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities (RPA) and suggested the need for regular reviews in implementation efforts and for substantial updating. After reviewing the major achievements of the Arctic Monitoring and Assessment Programme (AMAP) and the Arctic Contaminants Action Program (ACAP) in addressing Arctic pollution, he described Arctic Council initiatives to address black carbon and methane pollution in the Arctic. The main avenue was the adoption in 2015 of the Framework for Action on Black Carbon and Methane, which requires national reporting of emissions and controls and includes an expert group review mechanism to assess

implementation progress and make recommendations for improvements.

Two NPAC fellows concluded the panel presentations with Russian and Korean case studies. A Russian fellow described the extremely complicated Russian system of regulating environmental protection and natural resources use in the Arctic, with more than 800 relevant documents. A Korean fellow reviewed how South Korea is implementing global pollution agreements, contributing to Arctic Council pollution initiatives, and promoting clean and green shipping.

Key discussion points included the following in relation to major pollution concerns:

- ***Mercury***—Thawing tundra is a major source of mercury emissions. Mercury bio-accumulates in animals on top of the food chain. Highest concentrations are found in beluga whales (even higher than in polar bears), since whales don't have hair that offers some protection.
- ***Plastics***—Fighting plastics pollution encounters a well-known externalities problem; victims of the pollution are located at a distance from the source. It is difficult to link source and victim and also to calculate the impacts of pollution.
- ***Heavy fuel oil (HFO)***—Even if HFO implies a higher fuel price, the general impression in the relevant communities is that the benefits outweigh the costs.
- ***Black carbon***—There have been some problems with reporting of BC emissions, mainly because of confusion about how reporting should be done. BC is not only a climate forcer, it is also a local health concern.
- ***Radiation***—Is radiation from Russian storage facilities built in permafrost that is now melting considered a major problem? Little is known about this besides a few references in Russian sources. The Norwegian foundation Grid-Arendal created a map of dump sites some years back.

Part V concluded with an exchange of views among panelists and participants around a question posed by the Chair: "What top priority action at the global or regional level would you suggest to better address Arctic pollution?"

Suggested priority actions included:

- Revising the Regional Programme of Action on Land-based Activities

and ensuring its periodic and independent implementation review.
- Addressing "grey water" pollution from ships, such as unregulated discharges from laundries, showers and sinks, through discussions within the IMO.
- Negotiating a new comprehensive and precautionary global chemicals convention to fully respect human rights and Indigenous rights in the Arctic.
- Ensuring climate change implications are fully considered in environmental and social impact assessments for petroleum exploration/exploitation proposals in the Arctic.

PART VI: THE ROLES OF NON-ARCTIC STATES IN THE ARCTIC

Part VI raises issues that have occupied a prominent place in the North Pacific Arctic Conference deliberations since its inception. NPAC started in 2011, prior to the acceptance of China, Japan, and Korea as Arctic Council observer states. Part of the motivation for launching NPAC was a desire on the part of these states to increase their engagement with Arctic issues and to cultivate a dialogue regarding these issues with the United States, Canada, and Russia, which would reflect a North Pacific rather than the more familiar North Atlantic perspective. In the years since the members of the Arctic Council accepted these non-Arctic states as observers in 2013, NPAC sessions have repeatedly considered the engagement of observers in Arctic Council activities and ways to enhance the contributions they are able to make without undermining the positions of the Arctic states or the Permanent Participants.

The consideration of this theme at NPAC 2019 was marked by a spirit of cooperation both in articulating shortcomings in existing practices and in searching for adjustments that would/could produce mutually beneficial results for Arctic states and non-Arctic states.

Speaking from an Asian perspective, one participant made it clear that China, Japan, and Korea have growing interests in Arctic affairs and that they regard themselves as legitimate stakeholders in this realm. But their role in Arctic affairs is to supplement, not to replace; to cooperate, not to overstep. Conversely, another participant, speaking from a Russian perspective, noted that Russia seeks to "protect its sovereignty and

sovereign rights in the Arctic from any kind of internationalization." But he also observed that, "Russia is among the countries which benefit from international cooperation in the Arctic, including with non-Arctic states."

Therein lies the challenge. How can the Arctic Council welcome engagement on the part of non-Arctic states while simultaneously acknowledging that the members of the Council have a legitimate special interest in what happens in the Arctic? The discussion during NPAC 2019 was marked by a willingness to consider this question in cooperative and practical terms rather than reiterating inflexible formulations that make it difficult to address specific issues constructively.

Approaches to this question can feature three levels. As a Russian participant put it, we can think about: (i) "more active engagement of observer states within the Arctic Council"; (ii) "engagement of non-Arctic states in a wider Arctic Council Framework"; and (iii) "closer cooperation between Arctic and non-Arctic states in relevant universal organizations."

Regarding the Arctic Council, it would help to adjust the rules of procedure to make the Council more welcoming to non-Arctic states and to increase flexibility regarding the role of observers. This might include measures such as relaxing requirements in the area of reporting or increasing flexibility regarding funding Council projects. At the same time, a number of participants noted that there is considerable variation in practices among the elements of the Arctic Council (e.g. the different working groups) regarding the roles of observers, so that it is difficult to formulate comprehensive policies regarding the participation of non-Arctic states. There is also considerable variation in the interests of non-Arctic states with regard to specific activities of the Arctic Council. This suggests the value of a pragmatic approach toward the roles of non-Arctic states, allowing for a good deal of flexibility in addressing specific needs for governance.

We are witnessing a proliferation of Arctic governance arrangements, some of which are closely related to the Arctic Council (e.g. the search-and-rescue agreement and the enhancement-of-science agreement), and some of which are evolving in different settings (e.g. the Central Arctic Ocean Fisheries Agreement and the science ministerial forum). This suggests that the role of the Council itself can and should center on efforts to coordinate/integrate the elements of this rapidly growing Arctic "regime complex" in the years to come. What makes this point relevant in terms of the issues considered in Session VI is that there is considerable room for

non-Arctic states to participate in a number of the elements of the Arctic regime complex. The 5+5 formula used to develop the Central Arctic Ocean Fisheries Agreement is an interesting model in this regard. So is the mechanism of the science ministerial forum, which allows representatives of non-Arctic states to participate freely. The role of the Council, in this formulation, is/should be to play a coordinating/integrative role rather than to make formal or legally binding decisions. This may facilitate efforts to engage non-Arctic state observers in Council activities on an informal basis without raising questions about who can participate in formal decision-making processes.

International cooperation in the realm of science, a priority concern for many of non-Arctic states as well as Arctic states, exemplifies what is possible in addressing Arctic issues of interest to many actors. What is emerging in this realm is a tripartite structure in which: (i) research priorities are identified by organizations such as the International Arctic Science Committee, a nongovernmental body open to scientists from many countries; (ii) matters of research policy and funding are considered in the science ministers forum, and (iii) practical matters involving issues such as visas, access to field sites, and the handling of data are dealt with under the 2017 science agreement among the eight Arctic states. The result is a mixed system that has the potential to advance the cause of scientific research on Arctic themes effectively.

Some Arctic issues are now dealt with in forums provided by universal organizations such as the International Maritime Organization, as is the case with the Polar Code. Here, the non-Arctic states can engage fully as members of relevant universal organizations. The need in such cases is to clarify practices involving the treatment of regional issues within universal organizations and to develop constructive relations between the Arctic Council and organizations like the IMO. For the most part, the Polar Code offers a positive example of what is possible in such contexts. The Arctic Marine Shipping Assessment, conducted under the auspices of the Arctic Council, played a seminal role in promoting the development of the Polar Code by preparing the ground for the successful effort of the IMO to address regulatory issues relating to Arctic shipping. Yet the code itself as adopted by the IMO is embedded in broader legally binding arrangements such as the SOLAS and MARPOL Conventions. It seems fair to regard this as a success story in the realm of Arctic governance. Still, there is room for clarification of the roles that non-Arctic states can/should play regarding

the treatment of Arctic issues in settings like the IMO.

A striking feature of the discussion in Session VI was the active engagement of members of the policy community, including senior officials from Iceland and Korea. These officials expressed a clear and constructive interest in thinking about ways to improve the cooperation between Arctic states and the non-Arctic state observers on matters of mutual interest. One point of agreement regarded the identification of practical suggestions for making suitable adjustments in existing Arctic Council practices. They observed that deliberations in settings like NPAC under the Chatham House rule are useful in developing innovative ideas that can inform policy processes.

The take-home messages from Part VI are that: (i) there are no simple and comprehensive adjustments to current practices of the Arctic Council that will solve all the problems arising in the relations between Arctic states and non-Arctic state observers; (ii) there is a spirit of cooperation between the two communities that now prevails; and (iii) there is a willingness to entertain a variety of ideas about practical steps that can improve the performance of the Arctic Council and the broader Arctic regime complex going forward.

CONCLUSION: ARCTIC FUTURES/NPAC FUTURES

Three prominent but somewhat discordant themes emerged from the discussions that took place during NPAC 2019. Taken together, these themes identify the drivers that will determine the content of the Arctic agenda going forward. They also pose a challenge and provide opportunities for NPAC as it enters its second decade.

The role of the Arctic in an era of climate change

The Arctic constitutes ground zero regarding the consequences of the onset of the climate emergency. In effect, it provides something of a "crystal ball" through which we can imagine future impacts around the planet. That is because the impacts of climate change are unfolding in the Arctic more rapidly than anywhere else on the planet, and they are accelerating and expanding. Arctic feedback processes in such forms as the recession and thinning of sea ice and the melting of the Greenland ice

sheet are increasing the global pace of climate change. Ironically, increased accessibility to the Arctic associated with the effects of climate change is accelerating the pace of efforts to extract Arctic hydrocarbons. Norway is opening areas in the Barents Sea to oil and gas development, and the Trump administration in the United States is intent on opening new areas in Alaska to such development. But the main event is occurring in Russia, where Novatek is moving vigorously to build on its initial success with the extraction and shipment of Yamal natural gas, and where the Russian government has taken steps that are linking the future of the Russian economy tightly to the continued development of Arctic hydrocarbons. The Russian commitment to the exploitation of the Arctic's natural resources is matched by the growth of Chinese interests in the region in such forms as substantial investments in the development of Russia's energy resources and in exploratory initiatives aimed at testing the feasibility of increases in commercial shipping using the Northern Sea Route. For its part, the United States is reacting to these developments in a competitive manner, calling for enhanced efforts to counter Russian and Chinese initiatives in the Arctic. The failure of the Arctic Council to agree on the provisions of a Ministerial Declaration at its 2019 biennial meeting is one highly visible manifestation of these new conditions.

For example, as the recent IPCC Special Report on the Ocean and Cryosphere in a Changing Climate concluded with "very high confidence" that global mean sea level (GMSL) is rising, with accelerations in recent decades due to increasing rates of ice loss from the Greenland and Antarctic ice sheets. There have also been increases in tropical cyclone winds and rainfall. The report stated with "high confidence" that extreme weather events, when combined with relative sea level rise, are exacerbating extreme rising seas events and coastal hazards. Further, the report documented with "high confidence" that there has been a decline in the abundance of fish and shellfish stocks due to direct and indirect effects of global climate change and attendant biogeochemical changes that contributed to reduced fisheries catches. In short, we know with great confidence that anthropogenic climate change is accelerating, with alarming implications for human societies. Yet the collective response has not yet been commensurate with the threats that have been assessed and documented in these and other venues.

The role of the Arctic in national and global policy

What are the implications of these developments for Arctic policy and more broadly the future of the region? A common denominator involves clarifying the tightening of links between what happens in the Arctic (which has historically been treated as a distinct region) and overarching global processes. Whether we focus on climate change, global energy markets, or the rise of great power rivalries, the story is the same. In the aftermath of the Cold War, the Arctic emerged as a distinctive but somewhat peripheral region with a policy agenda of its own dominated by issues of environmental protection and sustainable development. This framing is no longer adequate. The consequences of the continued rise in global emissions of greenhouse gases is are changing the Arctic dramatically. The fate of Russia's gamble on fossil fuels as the key to its economic resurgence will be determined in large measure by the dynamics of the global energy market. The China-Russia-United States rivalry is already diverting attention from efforts to pursue the UN 2030 Agenda in the Arctic with its focus on sustainable development.

Increasingly, these developments are calling into question the premises underlying the cooperative activities of the Arctic Environmental Protection Strategy that began in 1991, followed by the Arctic Council in 1996. Founded on the premise that the Arctic is properly treated as a zone of peace focused on cooperative efforts to address questions of environmental protection and sustainable development and insulated from the effects of great power rivalries, these bodies have performed remarkably well. The Arctic Council, which is widely recognized as the most important Arctic policy forum, has played a central role in highlighting issues such as the impact of pollutants (e.g. POPs and heavy metals) in the Arctic, and spearheading efforts to persuade other bodies such as the International Maritime Organization to adopt regulatory measures applicable to commercial shipping in polar waters. But the trends described above raise fundamental questions about the role of the Arctic Council going forward. The Council is not in a position to make a difference regarding the course of climate change; it is not even well equipped to play a major role regarding the adaptation of Arctic communities to the impacts of climate change. The Council has little influence over the dynamics of world markets for oil and natural gas. The emerging rivalry among China, Russia, and the U.S. in the Arctic constitutes a threat to the normal operations of

the Council rather than an issue that the Council is in a position to address effectively on its own.

All this suggests the need to rethink the basic narrative underpinning efforts to address issues on the Arctic policy agenda. From the end of the 1980s, we have organized our thinking in terms of the "Arctic zone of peace" narrative. According to this narrative, the Arctic is a distinct region with a policy agenda of its own; the eight Arctic states are and should be acknowledged as the key players in addressing Arctic issues; there is no shortage of governance arrangements in place to deal with Arctic issues, and the primary concerns in this region involve matters of environmental protection and sustainable development.

Clearly, this narrative is not sufficient as a basis for organizing thinking about Arctic policy in the future. It is not just geopolitics, but also the growth of interest in the region by non-Arctic but highly involved states. But what is the alternative? There is a natural tendency among analysts and policymakers alike to fall back on the familiar neo-realist narrative emphasizing competition rather than cooperation and the resultant reemergence of high politics in the Arctic. In this case, we should expect the Arctic to be drawn into the dynamics of great-power rivalries played out on a global scale. But this line of thinking also is not persuasive. Most of the cooperative mechanisms put in place under the auspices of the Arctic Council continue to work well and would be damaged. The challenge of climate change in the Arctic urgently calls for collaborative responses rather than national programs, which are more about exploitation than environmental protection. Sustainable development continues to provide a convincing rationale for cooperation rather than competition for people who are concerned with the fate of the Arctic. If there is one over-arching message from NPAC 2019, it is that every human is included in that group of people, since what happens to the Arctic most definitely does not stay in the Arctic.

The future of NPAC and its international roles

All this suggests that a critical determinant of the future of the Arctic will be the capacity of policymakers and analysts to articulate and disseminate a new Arctic narrative that can provide a basis for coherent thinking about matters of Arctic policy. This introduces both challenges and opportunities for the North Pacific Arctic Conference. Bringing together

policymakers and analysts from both Arctic and non-Arctic states who engage in free-flowing conversations without fear of being quoted directly, NPAC has been able not only to foster innovative thinking about specific Arctic issues but also to promote a sense of engagement in a common effort to contribute to new ways of thinking about the future of the Arctic in a shifting global context. The principal elements of a new Arctic narrative are far from clear at this stage. But there is no doubt about the usefulness of thinking about such matters in a setting that encourages constructive transnational and off-the-record dialogue. NPAC remains committed to providing such a platform into the future.

Notes

1. Many of the following points are based on Session Chairs' Reports from the 2019 North Pacific Arctic Conference prepared by Robert W. Corell, Charles E. Morrison, Arild Moe, Yoon H. Kim, David L. VanderZwaag, and Oran R. Young.

PART I

POLICY DIALOGUE ON GLOBAL–ARCTIC INTERACTIONS

Keynote Speech: All Eyes on the Arctic

Heung Kyeong Park[1]

The theme for this 2019 North Pacific Arctic Conference, organized by the East-West Center and the Korea Maritime Institute, is "Global-Arctic Interactions: The Arctic Moves from Periphery to Center." It is a most appropriate one in view of recent events in the Arctic.

The Arctic environment continues to show dynamic and sometimes worrisome changes. As the AMAP of the Arctic Council stated, annual average warming in the Arctic continues to be more than twice the global mean. Arctic annual surface air temperatures over the past five years have exceeded those of any year since records began in 1900. In 2020, global warming continued to accelerate, generating further meteorological interactions between the Arctic and its neighboring regions.

In one of those regions, Europe, a heat wave hit hard, setting all-time high temperature records of more than 40 degrees Celsius in Belgium, Germany, Luxembourg, and the Netherlands. The heat wave also exacerbated the process of melting Greenland's ice sheet. Greenland lost 160 billion tons of ice in July, which reportedly had an impact equivalent to a 0.5mm rise in global sea levels. Last year, Arctic sea ice extent again hovered at record lows during the melt season.

These rising temperatures propel other impacts as well. Since the start state between June and September of 2019, the Copernicus Atmosphere Monitoring Service (CAMS) tracked more than 100 intense and long-lived wildfires in the Arctic Circle. In June alone, these fires emitted 50 million tons of carbon dioxide into the atmosphere, which is equivalent to Sweden's total annual emissions. This is more than was released by Arctic fires in the same month between 2010 and 2018 combined. Furthermore, particles of smoke land on snow and ice, causing the ice to become darker and absorb sunlight that it would otherwise reflect, thereby accelerating warming in the Arctic. Fires in the Arctic also increase the risk of further permafrost thawing that releases methane, which is also a greenhouse gas.

With a backdrop of these interactions and interconnections between the Arctic and the globe, Korea has steadily participated in cooperative activities concerning the Arctic, both before and after joining the Arctic Council as an observer state in 2013. In order to handle Arctic issues in

a systematic manner, the Korean government adopted its 1st Arctic policy Master plan in 2013 and a 2nd Master plan in 2018. The new plan has four goals: (1) pursuing cooperation with Arctic communities; (2) promoting Arctic partnerships; (3) strengthening scientific research activities; and (4) strengthening Korea's capacity to pursue Arctic policy. I would like to share with you the underlying issues and recent developments regarding the four goals.

The first goal is to pursue mutually beneficial cooperation with Arctic communities. As Korea imports almost all of gas and oil, it is keenly interested in energy resource development in the Arctic. As a maritime nation, Korea is also an important stakeholder in developing Arctic shipping routes. Korean companies made the first test navigation through the Northern Sea Route (NSR) in 2013 and sent ships through the route three times in 2016. These voyages reaffirmed that the NSR is a shorter route to connect Asia and Europe compared to the southern route via the Suez Canal. In September 2017, Korean President Moon Jae-in announced the New Northern Policy and Nine-Bridge Strategy, which incorporate the potential of the Northern Sea Route. We believe that if the Arctic shipping routes become commercially competitive, it will open up a new era of economic ties between Asia and Europe. In addition, Korean shipbuilding companies have built and delivered a total of 15 Arc-7 class ice-breaking LNG carriers for the Yamal project in the northwestern part of Russia.

The second goal is to promote partnerships with Arctic states and other participants. Korea joined the Arctic Council as a permanent observer in May 2013. We have readily participated in the work and activities of the Arctic Council and other international bodies and regimes. Korea has regularly attended the Senior Arctic Officials meetings and the Ministerial meetings. Korean experts have participated in working groups, task forces and expert groups in the Arctic Council. For instance, Korean officials and experts attended the meetings of the Arctic Council and its subsidiary bodies 19 times in 2018.

Paying special attention to the human and social dimensions of Arctic issues, Korea has established various programs and activities to engage Indigenous Peoples and communities. Korea Maritime Institute (KMI) has provided financial support and mapping technology to the Aleut International Association (AIA) for its "Artic Indigenous Marine Use Mapping project." KMI has also joined the Arctic Renewable Energy Atlas (AREA) project as partner in SDWG of the Arctic Council. And with

the exchange program, "Korea Arctic Academy," KMI has invited 150 young students to Korea since 2015, including 47 Indigenous students in cooperation with the University of the Arctic. In 2018, Korea launched a new initiative, the "Arctic Science Fellowship Program," targeting early-career researchers from Arctic countries.

In addition, Korea has pursued bilateral cooperation with various Arctic Council member states and observer nations. For example, Korea holds bilateral consultations on a regular basis with AC members Canada, Denmark, Finland, Iceland, Norway, and Russia. Moreover, Korea launched the Trilateral High-Level Dialogue on the Arctic in 2016, along with Japan and China. Last June, Korea hosted the fourth session of the trilateral high-level dialogue, adding a separate expert group meeting to explore potential areas of cooperation on an ad-hoc basis for the first time. Last December, Korea also cohosted the Arctic Circle Korea Forum along with the Icelandic Arctic Circle Secretariat, with 250 officials and experts participating from Korea and abroad.

Meanwhile, Korea signed the Central Arctic Ocean Fisheries Agreement with five Arctic coastal states and four other fishing states with a view of the protection and sustainable management of marine resources in the Central Arctic Ocean. Korea will take part in cooperative efforts to prevent illegal, unreported, and unregulated fishing in Arctic Sea areas.

The third goal is to strengthen scientific research activities in addressing common challenges in the Arctic. In 1991 we first conducted our first basic scientific survey in the region. We then established the Dasan Arctic Research Station in Svalbard in 2002 and built our first ice-breaking research vessel, *Araon*, in 2009. Korea has contributed to the Arctic Migratory Bird Initiative (AMBI) under the working group of Conservation of Arctic Flora and Fauna (CAFF) working group. Separately, Korean scientists have continued to conduct scientific research, mostly in cooperation with other partners, with a view to conserve vulnerable ecosystems and to monitor weather changes and ecological conditions in the Arctic. For example, the Korea Polar Research Institute (KOPRI) has conducted the Korea-Arctic Ocean Observing System project, which monitors marine organisms in the Arctic Ocean. The Korean research icebreaker *Araon* has incorporated plankton sampling in the project and has yielded microscopic specimens and pigment samples.

As well as monitoring natural conditions, Korean researchers have been assessing the impact of artificial influence on the Artic. *Araon* has conducted

additional surveys on the state and effects of marine litter in the region, including micro-plastics, by collecting samples from seawater, the sea floor, and sea ice. Korea has also focused its investigative efforts towards securing the future of Arctic resources. Korea voluntarily submitted a national report on black carbon and methane to the related expert group. Our scientists have also carried out various joint research projects with Arctic states and international scientific institutions, such as the International Arctic Science Committee.

In order to strengthen its scientific research activities, Korea plans to launch the Arctic Ocean Collective Expedition (ACE) initiative with the view of effectively utilizing the active vessel *Araon* and a second ice-breaking research vessel, which a related ministry has been eagerly pursuing.

The fourth goal is to strengthen our national capacity to execute Arctic policies. The Korean government plans to develop domestic institutional foundation support. It plans to pursue the enactment of legal grounds for cooperation in the Arctic region. It also plans to systematically coordinate a set of implementation bodies, although the Korea Polar Research Institute (KOPRI) is the leading agency for Korea's national polar program. KOPRI has been conducting research, utilizing platforms such as the Dasan Arctic Research Station in Svalbard and the ice-breaking research vessel *Araon*. In addition, Korea aims to educate and train professionals and strengthen activities to enhance public attention and awareness about the importance of the Arctic. In this regard, the Korean government hosts the annual "Arctic Partnership Week," featuring a series of seminars, exhibitions, and events related to the Arctic. Last year, more than 1,000 participants from Korea and abroad attended the event.

I would like to conclude by saying that Korea will continue to participate in protecting the ecosystems of the Arctic and exploring its sustainable use. We welcome any cooperative international efforts towards that end.

Notes

1. Ambassador Park is now the Republic of Korea's Ambassador to Cambodia.

Arctic Genesis?

Tony Penikett

In 1867, the United States purchased Alaska from Russia. Nowadays, Alaskans would strongly object to such a "sale"—as would Yukoners, Nunavummiut, and Greenlanders in similar circumstances. In the 21st century, northern peoples have found their voices, something the global south does not yet understand. Ólafur Ragnar Grimmson, former president of Iceland, observes that particularly in the federal states—the United States, Russia, Denmark, and Canada—capital cities exist at the greatest physical and psychological distance from their Arctic regions.[1] With that in mind, let me offer a distinctly northern Canadian perspective, including both an historical view and some speculation on the fundamental policy question of Indigenous-Settler relations.

We recognize the Mediterranean Sea as the birthplace of Western civilization: Greek philosophy, Arab arithmetic, Roman law, and notions of imperialism and empire later inherited by Spain and other European powers in their "conquest" of the Americas. This conquest involved the enslavement and slaughter of millions of Indigenous Americans.

Like the Mediterranean, the Arctic is an ocean surrounded by land, and a region alive with innovation. An outstanding question in Arctic policy has been whether the Arctic States and world powers might repeat this historic nightmare in the Americas on the shores of the Arctic Ocean.

One can imagine at least three possible futures for the Arctic: assimilation, annihilation or accommodation. Could colonization and globalization turn the northern polar region into a poor imitation of the global south? Perhaps. Could the climate crisis that is already uprooting coastal communities and shifting fish and game populations make Arctic residents its first fatalities? No. Or might Arctic Indigenous villages, Settler cities and regional governments forge syncretic accommodations to create a new community of Arctic communities?

Let us hope so.

Outsiders

Historically, the outside world viewed the Arctic as a vast empty space full of little but snowdrifts and polar bears, yet rich with untapped resources. For centuries, the Arctic has been the locus for dreams of instant riches: Aleutian sea otter pelts, Beaufort whales, nuggets of Klondike gold, and deep-sea drill rigs. For southerners, this dream of Arctic bounty awaits them still.

The Arctic's harsh environment once prevented corporations from plundering all of its rich natural resources. Now, the melting of the polar icecap opens the Northern Sea Route and the Northwest Passages to exploitation by southern trading nations.

Arctic maps show only tiny communities dotting the white ice, but the dots' inhabitants have different perspectives on those cartographic points. For northerners, the Arctic is *home*. Outsiders who come north to get rich quick, the locals label "boomers." Throughout modern Arctic history, outsiders called the shots. Nowadays, Northern peoples, "lifers" especially, demand fair shares of any developments and the last word on major economic decisions.

Out of the Mediterranean

The Mediterranean Sea was the birthplace of Western civilization. Greeks founded the fields of science, philosophy and mathematics. Universities still teach the philosophies of Aristotle, Plato and Socrates. Greeks invented democracy, and also the practice of rhetoric and dialogue. Muslim mathematician al-Khwarizmi learned from and expanded upon Greek mathematicians Euclid, Pythagoras, and Thales. Algebra comes from an Arab word "al-jabir," and we all use "Arabic numerals: 0, 1, 2, 33..."[2]

Even after Greece fell under Roman rule, Rome exported Greek learning to the far corners of the Empire. Centuries later, the Italian Renaissance rediscovered classical Greek ideas and Roman notions of conquest and empire.[3] Then, in 1492, Christopher Columbus, an Italian sailor in the employ of Spain's monarchs, arrived in the Americas. So began the conquest and colonization of the New World.

To the Americas

When Columbus returned from his first voyage to the Americas in the spring of 1493, Pope Alexander VI issued an edict donating the New World to Spain's monarchs. In rewarding Ferdinand and Isabella for the expulsion of Jews and Muslims from Iberia,[4] the pope prayed that the New World's "barbarous nations be overthrown and brought faith itself."[5] For Indigenous Americans, the pope's hope meant slaughter, slavery, and continental smallpox epidemics.[6] This "clash of civilizations"[7] or cultures triggered the burning of Aztec writings, the looting of Mayan temples and Inca regicide.

None of this happened without debate. The Dominican cleric Bartolomé de las Casas loudly protested the brutality of Hernán Cortés' conquest of Mexico. While millions died at Conquistador hands, Las Casas tirelessly petitioned the Spanish monarch Charles V to intervene. In 1550, the king finally referred arguments about the morality of the Conquest to a judicial inquiry. Juan Ginés de Sepúlveda, a Catholic intellectual, defended Cortés's savagery by invoking Aristotle's theory of "natural slavery" to describe Indigenous Americans as "inferior to the Spaniards as infants to adults and women to men."[8] In rebuttal, Las Casas questioned how a pope with only spiritual powers could grant temporal powers over Mexico and Peru

to a Spanish monarch. He passionately argued that, before the conquest, Amerindian Nations lived in great cities, with their own kings, laws and judges. Sadly, the Valladolid tribunal failed to reach any conclusion and a legend of Indigenous governmental incompetence took root. However, historians now realize that when Cortés levelled Tenochtitlan in 1521, the Aztec capital was perhaps the largest city in the world.[9] In the Caribbean, Columbus had discovered a Garden of Eden.[10] For Indigenous populations, the Conquistador invasion unleashed by Pope Alexander VI turned it into a living hell.

Following an Indigenous "uprising" led by Ottawa warrior-genius Pontiac, England's King George III issued the Royal Proclamation of 1763, which affirmed: "the several Nations or Tribes of Indians...who live under our Protection, should not be molested or disturbed in the Possession of...their Hunting Grounds."[11] Thomas Jefferson responded that, "The English King has...endeavored to bring to the inhabitants of our frontiers, the merciless Indian Savages whose known rule of warfare is an undistinguished destruction..."[12] Less excitable, George Washington saw the Proclamation merely as a "temporary expedient to quiet the minds of the Indians..."[13]

Nevertheless, in consequence of the Royal Proclamation, the United States negotiated hundreds of Indian treaties, almost all of which were subsequently violated by federal authorities.[14] Canada followed a similar path in the 19th and 20th centuries with a series of "numbered treaties," reserves or reservations on marginal lands and, therefore, ensuring nearly permanent poverty for most Indigenous inhabitants.

Rationalizers and Revisionists

Enlightenment intellectuals rationalized the conquest of the Americas. John Locke, an investor in a Carolina colony trading Indian slaves, argued that a colonizer earned the right to take Indigenous lands by "improving"[15] the soil[16] with his labour.[17] Adam Smith added that, as nomads, Indians could not actually own land.[18] In 1832, Chief Justice John Marshall of the U.S. Supreme Court ruled that the Indian Nations' "relation to the United States resembles that of a ward to his guardian."[19] Not farmers or Nations or citizens, America downgraded its original peoples to dependents or children.

Old ideas die hard. In 1937, Winston Churchill declared: "I do not admit for instance, that a great wrong has been done to the Red Indians of America… by the fact that a stronger race...has come in and taken their place."[20]

What historian Alfred W. Crosby called "the Columbian Exchange"[21] between the Old World and the New involved massive swaps of foods, flora, fauna, trade goods—and also germs. This was not fair trade; Aztec gold and Inca silver financed the industrial revolution in Europe. Locke believed the Indian hunter "owned" the deer he had killed, while the Indian Nation viewed game as the common property of the community that depended on its meat, skin and bones.[22] Thus Locke's idea of "improvement" enriched America's landlords but impoverished Indigenous communities.

In the 20th Century, scholars began to question the shaky foundations of Indigenous-Settler relations. Revisionists such as Charles Mann argued that pre-1491 populations of America were farmers and landowners, not landless nomads.[23] Anthropologist Ronald Wright noted that surviving Indigenous nations trod paths of syncretism, routes that allowed a minority community to borrow useful features of the dominant society (cars, hospitals, iPhones) in order to guarantee the survival of their core cultural values such as land, language, and law.[24]

Though mainstream society is increasingly aware of the impacts of colonization on Indigenous Peoples, the ideologies of Locke and Smith still prevail. Reconciling rival Settler-Indigenous worldviews remains unfinished business, the resolution of which will undoubtedly shape the Arctic's future.

The Arctic: Three Possible Futures?

Like the Mediterranean, the Arctic is an ocean surrounded by land. Colonization in the Arctic began centuries ago, and eight nation states now assert sovereignty over the homelands of the region's Indigenous peoples: Athabascans (Dene), Aleut, Inuit, Sámi, and numerous Indigenous tribes scattered around modern Russia. Inuit homelands include northern Canada, Greenland (Denmark), Russia, and the United States. The Sámi still occupy Arctic regions of Norway, Sweden, Finland and Russia. Northern Dene largely live below the tree line in Alaska and Northern Canada. Only in Greenland do Indigenous People, the Inuit, represent a large majority. *"Is the North American Arctic destined to relive the old Conquistador story?"*

Consider three possible futures for the Arctic:

The Arctic becomes less northern and more Southern: As portrayed by Laurence C. Smith in *The World in 2050*,[25] the Far North becomes more and more like the south. Smith observed that landscapes transformed by globalization and climate change will open new arenas for Arctic Ocean navigation, propel major population shifts and new agricultural opportunities, and open the door for new mines, pipelines, and environmental despoliation. While "boomers" may come north to profit from climate change, northern "lifers" work to adapt to the climate events while building community. On the frontline of Arctic changes, boomers and lifers will debate their respective futures.

Climate catastrophes cause even greater calamities: Many political leaders may avert their eyes, but climate catastrophes present dark prospects for the planet. None of climate scientist Robert Corell's data surprises Arctic residents—although they feel relatively powerless to resist the destructive effects.[26] Liberal media in southern cities tend to paint Indigenous northerners (including polar bears) as the inevitable victims of the climate crisis. But if climate catastrophes breed global economic collapse, massive extinctions, population exoduses, or even thermonuclear war, might Arctic peoples be the only human communities resilient enough to endure? Northerners live far from target cities but know how to live off the land: to hunt, fish, forage and build shelters with materials at hand. Arctic communities might then be the only survivors of climate catastrophes.

An Arctic community shaped by northerners: Can an Arctic community of tiny communities truly shape the Arctic's future? What has actually happened in the last 50 years? Has the pivotal issue of Indigenous-colonizer relationship evolved beyond colonial patterns? Are northerners breaking trail in new directions? Yes. Over the past 50 years, the Arctic region has been an important laboratory for inter-societal conflict resolution. On the borders of the Arctic Ocean, might we even imagine the birth of a new post-colonial political order?

Mediterranean 2.0

Out of sight of most southern observers, beyond the gaze of global media and far from the thoughts of world leaders, Arctic communities have

learned from America's tragic histories. For the last two generations, they have been determined not to repeat that misery. In this pursuit, Arctic leaders, Indigenous and non-Indigenous, have been highly inventive in governance, diplomacy, and philosophy. Among their innovations:

- 1970: A thousand years after the first Olympic Games, the first Arctic Winter games at Yellowknife revived Inuit games (one-foot-high kick and two-foot-high kick), and Dene sports (hand games and pole push). Of course, today's competition also includes hockey, cross-country skiing, and snowshoe races.
- 1971: When explorers found oil in Alaska, oil giants plotted pipeline routes on state maps but Alaska Natives told them to stop, saying, "You do not own the land."[27] Expeditiously, the United States Congress passed the Alaska Native Claims Act, the most generous treaty in U.S. history. It provided 37,000 Indigenous Alaskans with a billion dollars and 178,000 km^2 of land, plus a template for what followed.
- 1975: Cree and Inuit leaders signed the James Bay and Northern Quebec Agreement, Canada's first modern treaty. Over the next 40 years, twenty more treaties followed, which covered the northern 40 percent of Canada's land mass. Indigenous co-management of fish and wildlife in the region became a key feature of these treaties, which embody reformed stewardship priorities that privilege conservation and subsistence over sports and commercial harvests.
- 1979: Greenland achieved Home Rule by 1979, Self-Government in 2009, and may become the Arctic's first Indigenous nation-state. The Arctic region has long suffered great power competition but northerners will tell the world "enough"; nowadays, the United States can no more purchase Greenland than China can *buy* Iceland.
- March, 1987: Norway's Gro Harlem Bruntland's UN report, *Our Common Future*, promoted the concept of "Sustainable Development"—development that balances economic and environmental needs.
- October, 1987: In a speech at Murmansk, Mikhail Gorbachev proposed that the Arctic region should cease being a Cold War battleground and become instead a "Zone of Peace."
- 1989: Following Gorbachev's cue, Finnish president, Mauno Koivisto launched the "Finnish Initiative," which ultimately became the Arctic Environmental Protection Strategy (AEPS)—to coordinate protection of the Arctic ecosystem.

- 1992: Yukon First Nations, the Yukon Territorial Government and Canada concluded the country's first Aboriginal Self-Government Agreements, which recognized regional rather than merely local government powers for Indigenous treaty signatories.
- 1996: at Yellowknife, Inuit leader Mary Simon negotiated "Permanent Participant" status for six international Indigenous organizations in the new Arctic Council forum created by the Ottawa Declaration.[28]
- 2001: The Stockholm Convention on Persistent Organic Pollutants,[29] signed following Inuit and Sámi lobbying campaigns, protects Arctic food sources from contamination by airborne chemicals from southern industrial centers.
- 2005: Norway adopted the Finnmark Act, modelled on northern Canadian experience, which authorizes Finnmark County and Sámi parliament co-management of regional lands and resources.
- 2008: Edward Vajda, a Western Washington University linguist, visited the Yenisei River to explore links between Siberia's Ket language and the Na-Dené languages of North America's sub-Arctic.
- 2019: Russia floated an Arctic nuclear power station. Launched from Murmansk, it sailed 5,000 km to Chukotka in the Russian Far East, where it will serve remote Arctic communities.[30].
- Three Nordic states and Sámi leaders are negotiating a Sámi Convention, potentially the first international treaty to be signed by an Arctic Indigenous people.
- By 2020, Norway's sovereign wealth fund will grow into a $1 trillion oil investment pool designed to build a post-oil economy.
- Meanwhile, artists and writers share their Arctic stories with the world: Alva Aalto, Robert Arthur Alexie, Pitseolak Ashoona, Pierre Berton, Gerd Bjorhovde, Bjørk Guðmundsdóttir, Maxim Gorgy, Edvard Grieg, Ted Harrison, Aka Høegh, Peter Høeg, Arnaldur Indridason, Ingmar Bergman, Aki Kaurismäki, Jewel Kilcher, Zacharias Kunuk, Halldór Laxness, Jack London, Finn Lynge, Henning Mankell, Mads Mikkelsen, Tahmoh Penikett, Kirill Shamalov, Jean Sibelius, Aleksandr Solzhenitsyn, Viljalmur Stefansson, Andrey Zvyagintsev, and others.

Arctic Genesis

Against a global backdrop of rising income inequality, raging white nationalism, China's Uighur "reeducation" camps, Russia's annexation of Crimea, an American president's embrace of the world's brutal autocrats, Canada's "blackface" embarrassment, Mexican border walls, Muslim bans, porn star payoffs, plastic pollution, police brutality, and political denial of the climate crisis,[31] might we envision an Arctic alternative?

Dare we imagine, on the shores of the Arctic Ocean—a threatened and mutating environment—the birth of a new consciousness based on the following: reconciliation between Indigenous and Settler communities; democratic debate and dialogue; social peace; a much longer view of immigration issues,[32] sustainable development; and climate adaption? And like the Mediterranean, could the Arctic become the basis for a global paradigm shift? Based on northerners' experiments and innovations over the last half-century, might we imagine something akin to an Arctic genesis?

Notes

1. Ólafur Ragnar Grimmson in Tony Penikett, *Reconciliation: First Nation Treaty Making in British Columbia* (Vancouver: Douglas & McIntyre, 2006), 2-3.
2. Mustafa Akyol, "Who's Afraid of Arabic Numerals?" *New York Times,* June 4, 2019.
3. "Whoever conquers a free town and does not demolish it commits a great error and may expect to be ruined himself," attributed to Niccolo Machiavelli.
4. Erna Paris, *The End of Days* (Amherst: Prometheus Books, 1995), 19. (That Spain was, for centuries, the most tolerant nation in Europe, and subsequently became the most zealously intolerant, is the heart of this book.).
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6. Tony Penikett, *Reconciliation: First Nation Treaty Making* (Vancouver: Douglas & McIntyre, 2006), 18.
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8. Juan Ginés de Sepulveda, *On the Reasons for the Just War among the Indians*, 1547.

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10. Laurence Bergreen, *Columbus: The Four Voyages 1492-1504* (New York: Penguin Books, 2011), 71. (from his diary entry for Sunday, October 21, 1492).
11. George III, Royal Proclamation of 1763.
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14. Tony Penikett, *Reconciliation: First Nation Treaty Making in British Columbia*, (Vancouver: Douglas & McIntyre, 2006), 49-67.
15. John Locke, "Of Property," *The Second Treatise of Civil Government and A Letter Concerning Toleration* (Oxford: B. Blackwell, 1948), 1689.
16. James Tully, *Strange Multiplicity: Constitutionalism in an Age of Diversity* (Cambridge University Press, 1995), 74-75.
17. Marilyn Waring, *If Women Counted* (San Francisco: Harper & Row, 1988), 30.
18. Adam Smith, The Wealth of Nations (London: W. Strahan and T. Cadell, 1776), 459-60.
19. *Cherokee Nation v. Georgia* 30 U.S. 1 (1832).
20. Elia Zureik, *Israel's Colonial Project in Palestine: Brutal Pursuit* (New York: Routledge, 2016), 213. Quoted from Winston Churchill's 1937 testimony to William Robert Wellesley Peel's Royal Commission on the British Mandate in Palestine.
21. Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (New York: Praeger, 2003).
22. John Locke, "Of Property," *The Second Treatise of Civil Government and A Letter Concerning Toleration* (Oxford: B. Blackwell, 1948), 1689.
23. Charles C. Mann, *1491: New Revelations of the Americas Before Columbus* (New York: Vintage Books, 2006).
24. Ronald Wright, *Stolen Continents: Conquest and Resistance in the Americas* (Penguin Canada, 2009), 150.
25. Laurence C. Smith, *The World in 2050* (New York: Dutton/Penguin Group, 2010).
26. Jonathan Watts, "The Arctic spring is starting 16 days earlier than a decade ago, study finds," *The Guardian*, March 2, 2018.

27. Tony Penikett, *Hunting the Northern Character* (Vancouver: UBC Press, 2017), 44.
28. The Arctic Council is a high level intergovernmental forum to provide a means for promoting cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic Indigenous communities...
29. The Stockholm Convention on Persistent Organic Pollutants is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods… Stockholm Convention. https://arctic-council.org/index.php/en/ chm.pops.int/TheConvention/Overview/tabid/3351/Default.aspx
30. "Russia floating nuclear power station sets sail across Arctic," *BBC News*, August 23, 2019.
31. Somini Sengupta, "US Pressure Blocks Declaration on Climate Change at Arctic Talks," *The New York Times*, May 7, 2019.
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Russia's Arctic Policies: Historical Legacies, Current Implementation, and International Cooperation

Andrey N. Petrov

Introduction

The Russian Arctic has historically been and currently remains a prominent part of the Russian realm that occupies a central place in both development discourses and policy practices. Throughout Russia's history, policymaking in the North and in the Arctic relied on changing perceptions of the role of this region in the Russian state. These discourses of Arctic development evolved over time, shaping both domestic and international policies. This essay discusses the current dynamics of Russia's development policies in the Arctic and places them in broader historical and societal contexts. The emphasis is on the continuity of policy approaches with the past and projections on how they will progress in the future. In addition, the paper considers the international science collaboration opportunities created by the new Agreement on Enhancing International Arctic Science Cooperation.

The Russian Federation uses several official designations to define its northern territories. The more traditional, Soviet construct is the "Russian (Far) North and Equated Areas" that comprises remote places with severe climates, and which cover approximately 60 percent of the country's territory. A more recent designation is the "Arctic Zone of the Russian Federation" (AZRF), which includes the following northern, primarily coastal, Russia's provinces: Murmansk Region, Nenets, Yamal-Nenets and Chukotka Autonomous Districts, as well as northern parts of Arkhangelsk Region, Republic of Karelia, Komi Republic, Republic of Sakha-Yakutia, and Krasnoyarsk Territory. The Russian Arctic Zone occupies 10.5 million square kilometers. With less than one percent of the nation's total population, it accounts for almost 80 percent of natural gas, 60 percent of oil, 90 percent of nickel, 60 percent of copper, and nearly 100 percent of platinoids extracted in Russia. Arctic regions contribute 12 percent of the country's GDP and 25 percent of total exports. In addition to currently exploited reserves, there are vast untapped resources of fuels, minerals,

water, and energy, to name but a few (Pavlenko, 2013).

Historical Context of Russia's Arctic Policies: State and Imaginaries of the Russian North

The development of the Russian-Soviet North was based on a colonial paradigm that has a lot in common with the Canadian and U.S. frontier experiences (Petrov 2018). Similar to Canada (and to the United States-Alaska relationship), the Russian discourse of developing the North was based on "othering" the North from the mainland and assigning a unique role to the region in the national mythology. The Soviet views largely inherited the core components of the Russian Imperial discourse on Siberia. In the public consciousness of Imperial Russia, Siberia and the North has always been the "other," but yet has been considered "ours" (Weiss 2007). Much like the American West, Siberia emerged as a mythical realm of future power and prosperity; an exotic yet integral part of Russia.

It is worth remembering that the Russian State has controlled its North and Arctic lands throughout history. The State has always been the central negotiator and actor in the "project" of developing the North, and that the evolution of development imaginaries (propagated by the state) has always been followed by the transformation in policies (enforced by the state).

After taking power, Vladimir Lenin (1918) strongly promoted the idea of rapid exploration and development of the North. The leitmotif of the Soviet development plan (GOELRO) was the "rationalization of allocation of productive forces" based on the geographic division of labor. GOELRO propagated the minimization of transportation costs by moving production closer to raw materials. Laid upon Lenin's concept of "comprehensive socioeconomic development," the paradigm of the equalization of development across the county was seized as a goal of socialism. Soviet policymakers fully embraced this discourse (Hill and Gaddy 2003).

By accepting a proactive modernization paradigm, the Soviet policy of northern development substantially diverged from Canadian policies of that time. In fact, it appears to be closer to ideas promulgated in U.S. historian Frederick Jackson Turner's 1893 *Frontier Thesis*, which viewed the U.S. *frontier* as an extension, not an adversary of the core. The North was "true" and "purely" Soviet, just like the West was fully American. The Soviet discourse empowered the ideas of acquisition and expropriation

of the North-space and its resources. This fundamental difference is the ultimate reason for drastically more extensive "development" of the Soviet North compared to the Canadian and Alaskan northern frontiers.

The early Soviet discourse of the North was a discourse of romanticism and modernistic triumphalism. There was a common belief in making the North a Soviet stronghold (McCannon 1998). The dominant discourse materialized in public policies. In 1932, the Soviet Government included the North into the plans of "rational distribution of productive forces." It was believed that northern regions would ultimately become self-sufficient. Soviet regional planning was built upon the ideology of *acquiring* and *remaking* the North by expropriating its riches for the Stalinist economy (McCannon 1998). This economic ideology also served a geopolitical goal of Soviet planners to re-construct Soviet nation-space and make the USSR self-sufficient in natural resources.

However, since the 1960s, development doctrine shifted to impose a truncated version of the Soviet doctrine based on using "natural resources available for quick extraction and giving the largest economic effect" (Programma KPSS 1961, 74). Thus, the Soviet discourse since has been focused on resource exploitation, a paradigm inherited in the post-Soviet times. This shift is important to explain persisting economic marginality and disproportionate sectoral and geographic regional development in the Russian North.

Current State and Significant Developments in Russian Arctic Policies

With their roots deeply in the history of Arctic exploration and northern development, current policies of the Russian Federation in the Arctic are multifaceted, albeit fragmented, encompassing economic, (geo)political, military, social, and environmental spheres. It has been observed that Russia has more than 500 legal documents regulating Arctic affairs (see also Berkman et al. 2019). There are also regional laws enforced by the Russian regions.

Russia is still seeking a new model for developing and managing the Arctic (cf. Sergunin and Konyshev 2014). The Soviet approach was largely discarded in the early- and mid-1990s, when development through populating and industrializing the North had been criticized both in Russia

(Agranat 1992) and in the West (Hill and Gaddy 2003). The Russian North, and the Arctic in particular, experienced rapid depopulation and deindustrialization (Heleniak 1999). However, the model of "shrinking of the intensively used space" and withdrawing from the North and other remote areas (for which Russia even received funds from the World Bank) has never been fully embraced and has been eventually rejected (as it was contrary to the discourse of northern development prevalent throughout Russia's history, as described above). As a result, both paradigms were discarded, and a reinvigorated version of the Russian/Soviet model with a much-reduced scope (but with considerable ambitions) reemerged. The philosophy behind this restoration remained virtually unchanged from the Soviet and Imperial Russian times, although methods and means evolved. The "leaner" option of development (first promulgated in the 1960s) supplemented by the focus on extractive industries, technologies and transportation, alongside with military security, represents a mixed and yet evolving model of development portrayed in and supported by Russia's Arctic policies.

The present state of the policies is the expression of the overarching idea that Russia is a (or, possibly, *the*) leading Arctic power, and that its policy in the Arctic needs to demonstrate its geopolitical and economic strengths in diverse ways: by ensuring the presence of resident populations and robust economic activity; availability of military assets; social stability; and global influence over the Arctic affairs agenda, including environmental protection and science (Pelyasov 2013). Russia has been actively pursuing territorial claims over the Arctic shelf and settling maritime border disputes whenever possible (such as with Norway).

The Russia's federal policies and strategies in the Arctic are expressed in the three key documents:

(1) Strategy for the Development of the Arctic Zone of the Russian Federation and Provision of National Security through 2020 (2013)
(2) Strategy of National Security of the Russian Federation through 2020
(3) Foundations of the State Policy of the Russian Federation in the Arctic through 2020 and beyond (2008)

The most recent Strategy (2013) identifies four key factors of Russia's Arctic development: extreme climate (with no reference to climate change), sparse industrial development and settlement, remoteness, and vulnerability

of Arctic ecosystems. To address these challenges, the Strategy calls for concerted activities in six primary directions. These include socioeconomic development (diverse industries), science and technology, communication systems, environmental security, international cooperation, and military security.

In order to implement the Strategy, the Russian Government adopted several Federal Programs (FPs). The mainline Program established in March of 2014 and extended in August 2017 to last until 2025 focuses on economic development. It proposed pouring 190 billion rubles ($7 billion in in Purchasing Power Parity Dollars) into the Program including (but not limited to) three priority areas: (1) development of the base or core zones of diversified industrial development; (2) investment in the Northern Sea Route (NSR), and (3) support for oil and gas extraction and technology. It is notable that the ideas of "diversified" economic development in the North and of the "base zones" are borrowed from a combination of the Soviet development paradigm and western economic development models. In other words, although Russia's Arctic economic development strategy remains focused on expanding extractive industries and Arctic navigation that supports them, the rhetoric and discourses of development in the Arctic retain signs of the Soviet model (exploitation and acquisition of space and making it inseparable from the rest of Russia).

Other elements of the Strategy are scattered around a myriad of FPs, such as FPs on environmental protection, science and technology, shipbuilding, transportation systems, fisheries, energy consumption, and predictions, etc. This patchwork makes it difficult to assess the full scope and success of the Strategy's implementation.

Most certainly, the Strategy has led to considerable institutional changes in Arctic federal governance. A 2014 Presidential Decree established the *Arctic Zone of the Russian Federation* (AZRF) as a separate unit of planning and management, and the focus of the Strategy's application. To oversee the implementation of the Strategy and direct development in the AZRF, in 2015 The Russian Government created the *State Commission on the Issues of Arctic Development*, chaired by a Deputy Prime Minister. The Commission coordinates activities among authorities at the federal, regional and local levels to implement the Strategy and associated programs, including strengthening the geopolitical standing of Russia in the Arctic, support for science, development of the NSR, military readiness, disaster prevention, economic development, and environmental protection, among

others. In addition, in February 2019 the Federal Government established a new "Arctic Ministry": the Ministry of the Far East Development added the Arctic to its portfolio to become *the Ministry of the Far East and Arctic Development*. This institutionalization marks an important turn in Russia's Arctic polices by creating a federal "home" for Arctic development and to some degree reinvigorating the long defunct State Committee on Northern Affairs that existed in the 1990s (Zhukov et al. 2019).

In the business and economic development spheres, a notable emerging change includes new initiatives of the Ministry of the Far East and Arctic Development to grant tax and customs preferences to "Arctic residents" (both companies and individuals) who are engaged in new extractive projects. This may include reduced taxation (fixed for a long-term), improved access to infrastructure (such as the NSR) and a streamlined decision-making process—in exchange for investments in Arctic projects.

In addition, major recent developments occurred in the functioning of the NSR. The NSR has global relevance as a way to drastically reduce travel time between Asia and Europe (by 25-30 percent) and is the only viable Arctic transit navigation route, at least in the short term. In this sense it is notable that Russia welcomed the inclusion of the NSR and Russian Arctic in China's *Polar Silk Road* initiative (2018). However, NSR's present use is overwhelmingly destination-based and domestic, with most cargo consisting of various mineral resources (LNG, ore, etc.). Intensified exports of LNG spearheaded rapid growth in the volume of transported cargo, which has tripled in three years and stands at 18 million tons in 2018, three times as much as at the peak of the Soviet Union. In a major management shift, NSR operations have been transferred from the Ministry of Transportation to the State corporation Rosatom (Russia's atomic energy state corporation).

Another important component of the Russia's Arctic policy that is related to both economic development and geopolitics is the control over the Arctic Ocean and its shelf. Russia is a party to UNCLOS. The country submitted its claims over 1.2 million square kilometers of the Arctic continental shelf, first in 2001 and then in 2015, including vast estimated mineral reserves.

Arctic strategies in Russia are intertwined with other policy arenas that involve Arctic territories. For example, Russia is implementing its *Concept of Sustainable Development of the Indigenous Peoples of the North, Siberia and the Far East*, adopted in 2009. The Concept is focused on incorporating

sustainable development concepts among various Indigenous Peoples, with respect to preserving the natural environment, "modernization" of economic activities, and improvement of social services. Currently in its third phase, the implementation plan concentrates on improving the quality of life, demographic characteristics of population, education accessibility, and preserving cultural heritage.

Broadly speaking, the most urgent pending issues in Russia's Arctic policy include (see also Pelyasov 2013; Romashkina and Melniklov 2017):

Economic and social:

(1) High costs and remoteness as an impediment of large scale development.
(2) Rapidly changing environment (permafrost thaw, floods, fires, erosion, etc.).
(3) Costly or non-existent technologies, lack of local innovation capacity and entrepreneurship.
(4) Limitations associated with curtailed investment and technological transfer under existing international economic restrictions.
(5) Diverging trends in economic development among Russian Arctic regions.
(6) Continuing lagging in quality of life and social services.
(7) Often problematic relationships between local communities and extractive companies, lack of meaningful benefit sharing.
(8) Management of the Arctic Ocean.
(9) Uncertainties about international economic cooperation in the Arctic: NSR, China, Arctic Five.
(10) Lack of investment in non-extractive activities.
(11) Demographic and health issues in remote communities, including shorter life expectancy and a decline in fertility, including among Indigenous People.

Political and power:

(1) Continental shelf boundaries, overlapping claims and other border uncertainties.
(2) Control over waters and navigation in the Arctic Ocean, including NSR.
(3) Emerging role of non-Arctic states in the region and Arctic governing structures (such as the Arctic Council).

(4) Use of shared infrastructure among Arctic Five (search and rescue, Svalbard).
(5) Military Security and NATO's presence in the Arctic.
(6) Role and future of the Arctic Council.
(7) Indigenous Peoples' rights.
(8) Building infrastructure, including military.

Russia's Arctic policy is Key in Defining Future Scenarios

Our work demonstrates that policy in the Arctic is recognized as the predominant driver of Arctic development in the future. A recent scenario workshop held by the Arctic-COAST research network in Naryan-Mar, Russia gathered more than 30 academics, policymakers, business representatives and local residents, including Indigenous northerners, to discuss factors and paths for the Arctic Zone of Russia through 2050 (Petrov et al. 2018). Three thematic scenarios were considered: social processes, economic development, and coastal and maritime development and navigation. In all three areas, Russia's domestic Arctic policies have been voted by the participants as one of the top two most important drivers of the future. The final scenarios created by the group also had Arctic policies as the defining vector. The first, most preferred scenario leading to sustainable development in the Arctic incorporates policies that stimulate innovation, entrepreneurship, equitable benefit sharing, and Indigenous rights. The second scenario, which portrays the Arctic developing under conditions of low resource demand, assumes that Arctic policies are directed to support non-extractive industries, such as tourism and military, while maintaining social programs. The third, resource-based scenario is defined by weak domestic policies overtaken by external interests and actors who exploit the Arctic's natural resources for their own benefit. Finally, the fourth scenario unfolds when neither the State nor external actors are interested in developing the Arctic (or the State does not have the means to pursue an active Arctic policy, as happened in the 1990s), which leads to depopulation, deindustrialization, and the Arctic in more in the role of a dependent. Again, in all these scenarios, domestic policies were recognized to play a critical role.

The current trajectory of the Russian Arctic is a mix of these scenarios, but only the nature of the policies, alongside with other factors, will be

able to push the development in a certain direction. Although Russia's Arctic policy is overall relatively strong compared to other Arctic states, the enormity of the tasks and the complexity of the Arctic Zone itself, as well as its special positioning in the Russia's imaginaries, creates considerable uncertainties in the future of this vast region.

Concluding Remarks

Russia's Arctic policies are still evolving and shaping to adjust to the current dominant political and economic discourses. However, these policies are deeply entangled by the histories of northern development in the Soviet Union and Russian Empire. In order to understand the policy trajectories in the 21st century, one needs to re-link current and future policymaking with its discursive historical context. This includes such elements as expropriating and acquisition of space that requires both physical and symbolic control over land, sea and resources, as well as a desire to integrate the northern frontier into the realm of the mainland. Rapid institutionalization of Arctic development policies through major government legislative and administrative initiatives is a sign that past legacies persist. Key initiatives of the last decade are manifested through adopting strategy documents, funding federal programs and institution building in order to govern Arctic development (e.g. the creation of the Ministry of the Far East and Arctic Development). The new institutional arrangements will likely lead to another round of influx of strategies and multimillion-ruble programs. Still, there remains both programmatic and spatial disjointedness of Arctic development policies, since development implementation efforts are either splintered among multiple ministries and programs or use mismatching geographical administrative units (i.e. the federally-defined Arctic Zone, a unit of spatial planning, consists of municipalities whose ability to exercise policies in limited to small budget and lack of authority (typically delegated to the region). The institutional experiment with the new Ministry and emerging federal programs built upon persistent northern development discourses and immediate policy demands will define the next few years of Arctic development policymaking in Russia.

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A Strategic Pause in the Arctic

Paul Zukunft

For the past 151 years, the United States has been an Arctic Nation. On March 30, 1867, Secretary of State William H. Seward brokered the acquisition of the Alaska territory from a cash-strapped Russia at a cost of $7.2 million—or roughly two cents per acre. Skeptics dubbed this landfall acquisition "Seward's Folly." Yet in hindsight, Seward might be considered a strategic genius when one takes into account the vast natural resources contained in and the pivotal nuclear deterrent role of the 49th State that would otherwise be sovereign to Russia today.

As an Arctic Nation, the U.S. does not lack for strategic directives, policy statements, and myriad federally, scientific-community and private sector-funded studies directed towards this region. But as you open this aperture in the context of the entire U.S. national security objectives portfolio, the Arctic finds itself in a strategic pause despite the stalwart efforts of Senators Lisa Murkowski (R-AK), Dan Sullivan (R-AK), Angus King (I-ME) and Alaska's sole congressman Don Young (R), among others. Indeed, we have hit the pause button at a time when the Arctic is anything but static. Here, I provide an overview of the strategic roadmap that currently exists, what's at stake in the Arctic, and a series of actions that would convey to the world that the U.S. is a pivotal stakeholder in the Arctic region.

Strategic Direction and Declarations

The Ottawa Declaration of 1996 formerly established the Arctic Council (comprised of Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden and the United States). This eight-nation Council serves as a coordinating body to address *non-maritime security matters* (emphasis added) to include safety of life at sea, maritime pollution, and subsistence living among the Indigenous inhabitants of the Arctic. The U.S. chaired the Council from 2015-2017, a period that straddled two administrations but lost momentum before the chairmanship transitioned to Finland in 2017.

National Security Presidential Directive 66 and Homeland Security Presidential Directive 25 were issued on January 9, 2009 and requires the following:

a. Increased capability and capacity to protect air, land and sea borders in the Arctic.
b. Increased maritime domain awareness to protect maritime commerce, critical infrastructure and key resources.
c. The preservation of global mobility of U.S. military and civilian aircraft and surface vessels throughout the Arctic region.
d. The projection of sovereign U.S. maritime presence in the Arctic.
e. The peaceful resolution of disputes in the Arctic region.

The National Strategy for the Arctic Region was promulgated on May 10, 2013 and delineates three lines of effort but does not make reference to NSPD 66 and HSPD 25. These lines of effort include:

a. Advancing U.S. security interests that explicitly address cooperation with state, local, tribal, public and private sector entities to advance regional infrastructure; enhance maritime domain awareness; and the preservation of freedom of the seas and future energy security.
b. Pursuing responsible Arctic stewardship that includes environmental protection; striking a balance between economic development and the preservation of cultural values; and advancing scientific research and charting in the Arctic. (Of note, approximately five percent of the Arctic Ocean has undergone hydrographic surveys that comport to 21st century charting standards.)
c. Strengthening international cooperation through continued engagement with the Arctic Council and International Maritime Organization (IMO) as well as acceding to the Law of the Sea Convention.

The Arctic Executive Steering Committee was established on January 23, 2015 to create a whole-of-government approach in coordinating these three lines of effort, but has been in hiatus during the current administration.

Other integral and by no means all-inclusive declarations, policies and studies include:

The 2008 Ilulissat Declaration among the five Arctic coastal states: Canada, Denmark (Greenland), Norway, Russia and the United States. The

Declaration reinforces a commitment to the Law of the Sea Convention and IMO on matters pertaining to overlapping claims; protecting the maritime environment and livelihoods of local inhabitants; and scientific research, safety and freedom of navigation.

The High Latitude Study of 2011, a three-volume, independent study that concludes with a requirement for a total of six polar icebreakers—three heavy and three medium class vessels—to be operated and maintained by the U.S. Coast Guard.

The International Code for Ships Operating in Polar Waters (otherwise known as The Polar Code) was adopted by the IMO in 2014 and entered into force on January 1, 2017. The Polar Code addresses ship construction, specialized training for crew members, safety of life at sea, and protection of the maritime environment.

Again, the U.S. is not lacking in the strategic narrative, but this narrative has not translated to meaningful and tangible outcomes. It is worth noting, however, just what is at stake in the Arctic. I share these insights from the perspective of first-hand observations in my frequent travels to the Arctic and direct interactions at the international, federal, state, tribal, local, and private sector levels as well as with the scientific community.

Natural resources—Approximately 13 percent of the world's oil reserves, one third of the world's natural gas reserves and more than a trillion dollars worth of metals and minerals that can be exploited through offshore drilling and seabed mining.

Fish stocks—As ocean temperatures rise and sea ice retreats, we can anticipate a northern migration of fish stocks. An international moratorium was established in 2018 that prohibits commercial fishing in the Arctic for the next 16 years. Yet at the same time, 87 percent of the world's fisheries are fully exploited, while nations such as China (which has ratified the moratorium) maintains a fleet of more than 2500 distant-water fishing vessels that ply the oceans worldwide. We can anticipate increased competition for dwindling fish stocks, as well as more illegal and under-reported fisheries. The U.S. has little to no capacity for at-sea enforcement of distant water fishing fleets in the Arctic.

The maritime environment—The increase in shipping activity is literally plying uncharted waters, exacerbated by extreme weather and wind-driven ice flows. The pollution-response infrastructure in the Arctic is nascent and ostensibly non-existent in the event of a vessel grounding that ruptures its

fuel and/or cargo tanks.

Our extended continental shelf—There is an area roughly twice the size of California's land mass that lies beyond the 200-mile U.S. exclusive economic zone. Under the Law of the Sea Convention (that the U.S. has not ratified) the seabed of this extended continental shelf and the riches that lay beneath it are sovereign to the United States. Concurrently, Russia, which is a party to the Convention, has made a claim that extends up to the North Pole.

Tyranny of distance—Despite our strategies and declarations, there is no U.S. deepwater port in the Arctic. The closest deepwater port is Dutch Harbor along the Aleutian chain, approximately 1100 nautical miles distant. This situation inhibits provisioning and logistics in the Arctic region.

Shortcut between Asian and European markets—The Northern Sea Route trims between 12-15 days of ocean transit or roughly 4700 nautical miles between these markets compared to the conventional Suez Canal routing scheme. Russia is already building out a fleet of ice-capable liquified natural gas (LNG) carriers to service the rich gas fields along the Yamal peninsula, and the Russian LNG carrier Christophe de Margerie was launched in August 2017. Furthermore, Russia established the Northern Sea Route Administration in 2013 that requires a Russian icebreaker escort vessel and confers sovereign rights over the Northern Sea Route in defiance of the Law of the Sea Convention. And in March of 2019, the Kremlin announced that any foreign warships transiting the Northern Sea Route must provide 45 days advance notice to include vessel characteristics subject to Russia's approval.

Bellwether for climate change—The Arctic is experiencing the highest pace of temperature rise on the face of the Earth and has given rise to the term, "Arctic amplification." (In the past 40 years, average temperatures have risen by more than seven degrees Fahrenheit.) Sea ice continues to diminish, which allows the Arctic Ocean to absorb more heat and create a feedback loop of more warming and more ice melt. One immediate consequence is coastal erosion. As sea ice retreats, there is no natural buffer against extreme sea states and today, more than 30 coastal communities in Alaska are at risk of inundation. Topping that list, more than 600 Inupiat native Alaskans reside on the island village of Shishmaref and have dwelled there for more than 400 years. Contingency plans are underway to re-establish their first nation homestead at an alternate location inland, as village homes are already falling into the sea.

Beyond coastal erosion, a warming Arctic affects global weather patterns, enabling the jet stream to meander, altering weather patterns and spawning severe droughts and historic fires such as the Camp Fire in California in 2018. Similarly, a warming atmosphere absorbs more water, resulting in historic flooding events, such as the one that unleashed more than 40 inches of rain upon the Houston metropolitan area during Hurricane Harvey in 2017.

Rising sea level—The land-based ice in Greenland is shedding gigatons of ice melt each year, while scientists are monitoring the collapse of the Florida-sized Thwaites Glacier in Antarctica, which alone could produce a two-foot rise in sea level. Estimates vary that the sea level will rise between one to two meters by the turn of this century, and there is empirical proof that the world's oceans are on the rise and the rate of increase is also growing. Absent a significant investment in infrastructure, coastal communities in New York, Hampton Roads, VA (home to more than 20 percent of the U.S. Navy), Miami, FL, New Orleans, LA, and California's San Francisco Bay Area will experience frequent seawater inundation. Several Pacific Island nations will cease to exist. The catch phrase, "What happens in the Arctic does not stay in the Arctic" has never been more poignant.

Militarization of the Arctic—Russia is on the cusp of delivering several ice-breaking corvettes within the next three years that can be equipped with the Kalibr-M cruise missile and carry a one-ton conventional warhead that can strike U.S. critical infrastructure with great accuracy and precision from a range of 2800 miles. Concurrently, several Russian search-and-rescue outposts in the Arctic are being retrofitted to support military operations.

In 2015, the Coast Guard cutter *Bertholf* was patrolling in the Arctic region when it detected a combined Russian and Chinese naval exercise. There are significant gaps in our maritime domain awareness in the high latitudes. Had it not been for *Bertholf's* surveillance and reporting, this naval exercise would have been undetected by other means.

The Silk Road runs through the Arctic—China has invested more than $90 billion in the Arctic and accounts for six percent of Iceland's GDP and 12 percent of Greenland's GDP. In addition, China owns 20 percent of the shares in Novatek, Russia's largest LNG producer. Concurrently, the Chinese icebreaker *Xue Long* has repeatedly conducted "research" within the extended continental shelf of the U.S. and established a pattern of behavior that would most likely challenge any claim made by the U.S. if and when we ratify the Law of the Sea Convention.

Subsistence living—A combination of increased shipping and the ambient noise and pollution risk that that imposes as well as the retreat of sea ice may very well impinge upon the cultural norms and ability to sustain subsistence living among the Indigenous residents of the Arctic. Freshwater reservoirs and aquifers are being subjected to salt water intrusion, while investments in resiliency are not keeping up with the pace of a changing environment.

Yes, the stakes are high, and so is our apathy from a strategic perspective—until such time we have a bona fide crisis in the Arctic. What I have laid out in the previous paragraphs are not "black swan" events per se, but "predictable surprises." The Arctic is the climate canary in the coal mine, while we find ourselves in a politically charged impasse debate that is centered on causality and not the consequences of a world that is changing. We are long overdue to harness a whole-of-government approach to establish a strategic foothold and multi-year commitment to maritime governance, security, and sovereignty in the Arctic region. I offer the following recommendations:

Resurrect and empower the Arctic Executive Steering Committee and charter a framework that is not subject to the vagaries of shifting political administrations.

Recapitalize our polar icebreaking fleet—Policies and papers do not add up to the kind of presence in the Arctic domain that is necessary to exert sovereignty in this harsh operating environment. As an Arctic Nation, we have not constructed a heavy icebreaker in more than 40 years and we are losing the technical means to do so in our industrial complex. Inconsistent political currents in the Congressional appropriation process have failed to include funding to build out a fleet of polar icebreakers. This has led to a lack of confidence among U.S. shipyards that would build ships appropriately described by the 26th Commandant of the Coast Guard, Admiral Karl Schultz, as "polar security cutters." Accordingly, it will be necessary to reserve space, weight, and power to accommodate combatant capabilities in this future fleet of polar icebreakers, which were not envisioned in our legacy fleet. Finally, our gross domestic product is more than 10 times that of Russia, yet our polar fleet is out numbered 20:1. This is not an issue of resourcing, but political will—which takes us back to recommendation #1.

Enhance maritime domain awareness in the Arctic—This runs the full gamut, from space-based to autonomous technology and an interagency

enterprise analogous to a joint interagency task force to assimilate this data and provide whole-of-government awareness.

Sustain combined military exercises with Norway and Canada—The U.S. does not have to "go it alone" in the Arctic. The USS Roosevelt carrier strike group recently participated in the Arctic exercise *Northern Edge* this past May, and has conducted combined operations in the Arctic with our NATO counterpart, Norway. Meanwhile, Canada is building out a fleet of six Harry De Wolfe class, ice-capable combatants.

Be prepared to conduct freedom of navigation exercises in the Northern Sea Route contingent upon the recapitalization of our polar icebreaking fleet.

Sustain the Arctic Coast Guard Forum to not only operationalize the treaties and binding agreements established by the Arctic Council, but to advance a multilateral maritime security regime among the Arctic Council nations.

Ratify the Law of the Sea Convention—The U.S. is a first-world Nation that has been the keystone in promoting world order, but is also the only Arctic nation and only G20 nation that has not ratified the Convention. The first order of business is to secure our sovereign rights over our extended continental shelf.

Advance a whole-of-science approach to address the affects of climate change on agriculture, infrastructure, natural disasters, the advent of "environmental refugees" as land masses give way to a rising ocean, marine mammals and fish stocks, Indigenous residents of the Arctic, economic, and yes—national security. A critical element of this approach is a coherent and bipartisan strategic narrative.

Revisit the Unified Campaign Plan to consider the consolidation of the Arctic region under one geographic combatant commander.

In closing, there is no lack of interest at the operational level among the many federal, state, local, tribal and private sector entities that have equities in the Arctic. What the U.S. lacks is a steady, strategic drumbeat at the policy and resourcing levels. At the same time, Russia has moved well beyond a metaphorical Sputnik in the Arctic, while the U.S. struggles to invest in the necessary resources to underpin its strategic narrative. Changes in the Arctic are accelerating, and this important region is increasingly dynamic. With this in mind, it is a time when the U.S. can ill-afford to be strategically stagnant.

The Arctic Moves from Periphery to Center: A Perspective from Iceland

Bryndís Kjartansdóttir

The Arctic has in a relatively short time transformed from a region primarily characterized by isolation, cold, and darkness into a region buzzing with innovation and opportunities. It has become a focal point for the international community, attracting global attention from governments, scientists and researchers, businesses and industries, international agencies, and non-governmental organizations alike.

Dissemination of scientific findings repeatedly reveal that the pace of change in the Arctic due to global warming is so rapid that new records are being set annually. As a fishing nation, Icelanders and Icelandic fisheries companies feel the effects of these developments dramatically, with changes in the migration and availability of fish stocks in Icelandic waters. In addition, the rapid melting of Icelandic glaciers has already caused massive changes in the courses of glacial rivers in the country, to mention only a few examples.

Adaptation to these changes will be challenging for many communities in the Arctic, as well as around the world, in the years and decades to come. This makes regional and international cooperation vital, not only for the future of the Arctic region, but also in the global interest. The drivers of change in the Arctic predominantly come from outside the region, but the ripple effects of changes in the Arctic are felt around the world.

Arctic affairs are a priority in Iceland's foreign policy. Iceland's Arctic policy particularly emphasizes matters relating to climate, oceans, and energy as well as sustainable social and economic development. These priority policy areas of the Icelandic Government find resonance in the priorities of the Icelandic Chairmanship of the Arctic Council.

Iceland took over Chairmanship of the Arctic Council from Finland in May 2019 and will pass it on to Russia in May 2021. This paper is about the role of a Chairmanship country in the Arctic Council, the key themes that Iceland is addressing during its Chairmanship of the Arctic Council, as well as longer-term Arctic related strategic issues addressed by the Arctic Council in light of the globalization of Arctic affairs.

Role of the Arctic Council Chairmanship

A large part of international cooperation in the Arctic is conducted through the Arctic Council. The bulk of the Council's work takes the form of scientific and knowledge-based projects, driven forward by the Council's Working Groups and other subsidiary bodies. Through the Working Groups and their projects, multiple studies on issues such as the impacts of climate change on flora and fauna, economies, shipping, and public health, among many others, have been compiled. The aim of this work is to enhance knowledge and provide policy recommendations on Arctic affairs and to advance international cooperation.

The Arctic Council has developed structures to include Indigenous representatives, known as Permanent Participants, in its work. This unique approach, among other things, adds Traditional Knowledge to the Council's scientific compilations, and in that way further expands knowledge of the Arctic and the environmental changes being witnessed in the region.

In addition, the Arctic Council has within its ranks close to 40 Observers, which include non-Arctic States, international organizations, and non-governmental organizations. The Arctic Council's rather unusual mixture of participants demonstrates both inclusiveness and the global nature of Arctic affairs.

The Chairmanship of the Arctic Council rotates every two years among the Arctic States. During that period the Chairmanship country hosts and chairs meetings of Ministers of the Arctic States, of the Council's main coordinating and governing body between Ministerial meetings, such as Senior Arctic Officials (SAOs), as well as the Sustainable Development Working Group. Since these meetings are rather large and quite numerous, providing logistical support is a large part of the work of the Chairmanship. Furthermore, the Chairmanship is responsible for the functioning of the Council, both with regard to its substantive work and its underlying structures. A vital part of the Chairmanship's work consists of ensuring continuity of the Council's contributions within these existing structures. In brief, the Chairmanship provides the role of coordinating different aspects of the Council's work and ultimately drawing attention to and raising awareness of the important issues arising from it.

Most Arctic Council projects are introduced by the Council's Working Groups in accordance with their respective mandates. A number of Arctic Council projects are ongoing, in that they continue from one

Chairmanship to the next. But every two years, new projects are introduced by the Working Groups, after having received approval by the SAOs. The Chairmanship country traditionally puts forward its own emphasis in a Chairmanship program, which is worked out in close cooperation with the Member States and the Permanent Participants. On the one hand, the Chairmanship program highlights areas of existing cooperation that the Chairmanship wishes to highlight. On the other hand, the Chairmanship often introduces new projects or events, within existing areas of cooperation, to the work of the Council and takes the lead regarding work on that issue.

The scientific work carried out by the Arctic Council's subsidiary bodies has yielded important discussions and results on a variety of issues. The Arctic Council has, for instance, increased and broadened our understanding of the Arctic ecosystem, and enabled us to make informed decisions on how we approach the region's environment and resources. This work is relevant to states and organizations outside the Arctic, which may to some extent explain the growing number of Observers in recent years. Our responses must be guided by the fundamental principle of sustainable development and all decisions based on state-of-the-art scientific knowledge. Working closely with all partners, inside as well as outside the region, is vital for both prosperity and security in the Arctic region.

In this respect, Iceland supports an active dialogue, based on best available scientific research and knowledge, conducted through dynamic collaboration among countries and organizations.

The Icelandic Chairmanship Program

Sustainable development is the guiding principle in Iceland's Chairmanship program. Its guiding principle—*Together Towards a Sustainable Arctic*—emphasises the need for harmonized international efforts. Moreover, Iceland's leadership highlights the need for a holistic approach to sustainable development that addresses equally each of its three pillars: the environment, the economy, and social considerations.

Iceland's Chairmanship program highlights certain aspects of the Council's already ambitious agenda, while also introducing new fields of cooperation through specific projects and events. The program contains four main priority areas, which will be discussed below.

First, the Arctic marine environment is a key focal point. Oceans reside at the heart of Iceland's program in the Arctic Council. The largest part of the Arctic region is comprised of its oceans and seas, and the welfare of a large part of the population in the Arctic is based on the sustainable utilization of marine resources. The Arctic Council's subsidiary bodies have carried out many important ocean-related projects, and Iceland will focus on the continuation and further development of projects in that field.

Iceland is particularly interested in strengthening Arctic Council cooperation on mitigating plastic pollution of the oceans. Within the Protection of the Arctic Marine Environment (PAME) Working Group, a regional action plan on marine litter in the Arctic is being developed in cooperation with other Working Groups. In order to further support this work, the Icelandic Chairmanship has designated a high-level representative to coordinate work in this area. In addition, the Chairmanship is planning an international scientific conference on the topic in Reykjavík, Iceland, in April 2020.

Iceland also wants to introduce a new project focusing on innovation and efficient utilization of marine biological resources, the so-called "Blue Bioeconomy." In the last couple of decades, we have seen an incredible increase in the percentage of utilization of catches. For some fishing companies, that number is bordering on 100%, meaning that they have virtually no biomass waste from their production. This has led to a dramatic increase in their total product value—and a dramatic decrease in waste and ecological damage. This experience has given Iceland inspiration to lead a project on the Blue Bioeconomy in the Arctic Council. By applying the sustainable methodology of this Blue Bioeconomy it is possible to dramatically increase the quality and market value of the products of the fishing industry in many of the Arctic communities through biotechnology and innovation. This is a good example of how innovation can be one key to allowing Arctic communities to thrive in a sustainable manner.

Iceland's second priority concerns climate and green energy solutions. Iceland welcomed the introduction by Finland of meteorology as a new area of cooperation within the Arctic Council and will maintain an emphasis on meteorological cooperation. The Icelandic Met Office, in cooperation with the meteorological agencies of the Arctic States, is working on a project focussing on three-dimensional mapping of glaciers. This method provides more accurate information than conventional two-dimensional mapping, especially in tracking the dramatic glacial reduction in our part of the

world.

The impending shift in energy sources from fossil fuels to renewable energy will also be important, both for reducing greenhouse gas emissions and for improving air quality in Arctic communities, some of which use almost exclusively carbon fuel despite often having an abundance of renewable energy resources within reach. Iceland aims for further work to be carried out in order to seek practical green energy solutions, focusing specifically on small communities in the Arctic.

The third main priority will be to support Arctic societies in building prosperous and sustainable communities. The Arctic Council has a strong record of promoting sustainable development and growth in the region. The rapid warming of the Arctic is generally not disputed, although we may not all agree on the relative contributions of various sources. In the coming decades, adapting to continuous warming of the Arctic will be a major challenge for many small Arctic communities, especially not least among Indigenous Peoples, and Iceland wishes to continue cooperation on matters such as adaptation and resilience, gender equality and connectivity.

Last but not least, Iceland will continue the emphasis of previous Chairmanships on striving for a stronger Arctic Council. We are dependent on a close and peaceful cooperation that stretches across borders and boundaries. Peaceful cooperation in the Arctic should continue to be at the forefront for us, as we better understand the ever-growing changes in the region. The Arctic Council has been an important venue for addressing issues of common concern and has contributed greatly to and enhanced understanding of the region—and in this way supported peaceful cooperation in the Arctic. The Council's clear mandate, with its regional focus on sustainable development in the Arctic, has given it an important role to play. Iceland attaches great emphasis to continued cooperation among members of the Council. Cooperation with other relevant states and organizations is also vital, and another strength of the Council is to play a more assertive role in this outreach. Enhanced cooperation with the Council's Observers is one way of contributing to this goal using innovative ways to engage with Observers in a more productive manner. A key for success in that respect is that Observers are able to contribute to the projects of the Arctic Council in a meaningful way.

Another part of Iceland's strategy for strengthening the Arctic Council is the formation of new partnerships. The Arctic Economic Council will

celebrate its five-year anniversary during Iceland's Chairmanship, and we plan to seize the opportunity to enhance collaboration between the two Councils and thus tap into the vast entrepreneurial spirit and resources of the private sector for the good of the Arctic.

Long-term Arctic-related Policy

The impacts of climate change are being felt throughout the Arctic and dominate a large part of the Arctic Council's agenda in different ways. Scientific findings include the fact that observed and projected annual average warming in the Arctic continues to be more than twice the global mean. Furthermore, Arctic glaciers, led by the Greenland Ice Sheet, are the largest land-ice contributors to global sea level rise. Even a fully implemented and successful Paris Agreement would not stop this Arctic ice from continuing to lose mass over the course of this century. These are but examples of findings that, together with many others, are becoming as alarming to the world at large as they already are to inhabitants of the Arctic region. The global implications of climate changes have become even more visible through multiple independent scientific data sets, including the observed and projected increase of greenhouse gases emitted as a result of permafrost thawing, and increasing rates of sea level rise.

The Arctic is a region of growing environmental concern. At the same time, expectations are high for the opportunities and the economic benefits in the region due to increased access to natural resources. In addition, a significant shift in the global geopolitical landscape and the desire to maintain the Arctic as a region of peace, stability and cooperation remains high on the political agenda of the Arctic States.

Those issues call for responses on the part of the Arctic Council, amongst other actors, to ensure wide access to best available knowledge of the Arctic region and to secure that Arctic voices are heard and taken into account in the world. Longer-term Arctic-related policy or strategic issues are of great importance to the future of the Arctic Council. At the same time, it is clear that longer-term strategic planning is beyond the capacity of a single Chairmanship to resolve.

For several years, the Arctic Council has been looking for ways and means to better respond to the changing relationship between the Arctic and the global system through more focused and longer-term plans. Indeed,

some of its Working Groups have already adopted longer-term strategies to guide work in their respective fields.

Traditionally, two-year Chairmanships plans are made at the biannual Ministerial meetings that provide a road map for the incoming Chairmanship. In this way, the Arctic Council has provided itself with the necessary guidance two years at a time.

At the conclusion of the first cycle of Chairmanships in the Arctic Council, in Kiruna in 2013, Foreign Ministers and representatives of the Indigenous Peoples' organizations adopted the statement *Vision for the Arctic*. The Kiruna vision contained the first joint vision since the Ottawa declaration that founded the Arctic Council for the future development of the Arctic as a region and for strengthening the Arctic Council to address Arctic challenges and opportunities.

Four years later, the Fairbanks Declaration further addressed the need for long-term thinking in the Arctic Council. The declaration instructs SAOs to develop the first Arctic Council strategic plan based on the Council's foundational documents and subsidiary bodies' strategies and guiding documents. The basis for this decision was that new challenges in the Arctic forced the Arctic Council to re-examine how it works and to re-focus its priorities.

Out of this ongoing evaluation, it appears clear that Ministers intended for the Arctic Council to adjust its direction in response to changing environment in the Arctic, identify priorities and focus areas for the future—and possibly also to re-affirm and re-define the Council members' common goals.

Subsequently, during the Finnish Chairmanship of the Arctic Council (2017-2019), considerable time and energy was devoted to the development of a strategic plan. This work resulted in rich discussions within the Arctic Council on the identification of challenges and about what direction to take in the different areas addressed by the Council. However, the strategic plan was not completed before the Ministerial Meeting in 2019 due to lack of consensus among the Member States.

Decisions of the Arctic Council are taken by consensus among the eight Arctic States, with full consultation of the Permanent Participants. Although consensus decision-making is a dynamic way of reaching an agreement, since it is based on the values of cooperation and respect, it can make reaching an agreement difficult when there are wildly divergent views. As it turned out, the work on the strategic plan touched upon key

issues of the work of the Arctic Council and proved too difficult to reach an agreement by the 2019 Ministerial Meeting.

The Rovaniemi Ministerial meeting in May 2019 kept the idea of strategic planning alive, albeit in a somewhat changed form. The Rovaniemi Joint Ministerial Statement, signed by all eight Foreign Ministers, contains one task for the Senior Arctic Officials. That task is to continue strategic planning in order to provide guidance and improve the efficiency and effectiveness of the Arctic Council, and to review the roles of the Ministerial Meetings, the Senior Arctic Officials and the Permanent Participants. SAOs are further instructed to report on this work to Ministers in 2021.

These instructions from the Ministers focus heavily on the internal structure of the Arctic Council, while the wording regarding the substantive work of the Council is not as targeted.

Long-term Arctic strategic issues continue to be of the utmost importance and remain high on the agenda of the Arctic Council. The issue of strategic planning has proven to be beyond the capacity of a single Chairmanship to resolve and requires continued efforts on the part of the Arctic Council. To lead ongoing work on strategic planning within the Arctic Council in line with the instructions by Ministers is one of the main tasks of the Icelandic Chairmanship. Discussions amongst the SAOs and the Permanent Participants on this issue have started and will continue.

Conclusion

There are challenging times ahead for Arctic cooperation, and major issues that need international efforts to be resolved in a successful manner. The Arctic Council must continue its good work on promoting cooperation, coordination and interaction among the Arctic States, Arctic Indigenous Peoples, and the world at large on issues related to sustainable development in the Arctic region. Through its cutting edge environmental, social and economic assessments, the Council can continue to contribute significantly to building knowledge about the changes taking place in the Arctic, providing guidance and recommendations to policymakers, and supporting a peaceful and prosperous Arctic for the future through international cooperation. The Arctic Council must continue to look for innovative ways to adapt to the changes in the Arctic, which have increasing global implications—and regularly review its internal work in that context.

A Perspective from an Early Career Researcher

Malgorzata (Gosia) Smieszek

Introduction

The Ministerial Meeting of the Arctic Council (AC) in May 2019 in Rovaniemi, Finland marked a sharp contrast with the culture of dialogue and cooperative spirit that has characterized circumpolar affairs since their institutionalized beginnings in the early 1990s. In only the second meeting in the Council's history attended by the ministers of foreign affairs of all eight Arctic states, the Rovaniemi meeting also became the first since the establishment of the AC in 1996 where Arctic countries were not able to agree unanimously on the wording of a joint declaration. This document, which had rarely been controversial, had historically summarized projects and accomplishments of the AC over the prior two years and set the direction for its work for the next biennium.

The inability to reach consensus in Rovaniemi can be largely attributed to the position assumed by the United States in the negotiations over the final text of the declaration, notably the hard-line opposition of the administration of President Donald Trump to the inclusion of any reference to climate change in the Arctic ministerial statement. This stance was unacceptable to every other AC member.

Instead of issuing a comprehensive Arctic Council Rovaniemi Ministerial Declaration, Finland, as the Chair of the meeting and outgoing chair of the Arctic Council, decided to issue two separate documents. The first was a very brief Rovaniemi Joint Ministerial Statement, which listed the main principles of Arctic cooperation and was signed in public by all eight Arctic ministers. The second was the Chair's Statement from Finland's Minister for Foreign Affairs Timo Soini, which included all issues that normally would have been included in the text of the declaration and reflected the key disagreement areas between the U.S. and all other Arctic states, primarily regarding climate change.

Beyond the discord over the text of the ministerial declaration, the United States decided to use the occasion of the ministerial meeting to also unilaterally single out and criticize China and Russia for their activities in the Arctic region. In his statement delivered on the day preceding the

actual Ministerial gathering, U.S. Secretary of State Mike Pompeo also denounced China for its aggressive behavior in other parts of the world and accused it of repeating the same expansion patterns in the Arctic. He also criticized Russia for steadily increasing its military presence in the region and its position with respect to the Northern Sea Route, including plans to connect it with China's Maritime Silk Road, announced by President Putin at the Belt and Road Initiative meeting in Beijing in April 2019. The unprecedented rhetoric adopted by Secretary Pompeo showcased the Arctic as a region of grand economic potential and an arena for power and competition, where the United States is ready to fortify its strategic and diplomatic actions to secure its interests from Arctic and non-Arctic states alike (U.S. Department of State 2019).

Ultimately, the skillful leadership of Finland and the separation of ministerial documents, together with the adoption of the report of Senior Arctic Officials (SAOs), effectively secured the basis for the Arctic Council's ongoing work for the next two-year period under the Icelandic chairmanship. However, Secretary Pompeo's speech and the rare unprecedented of eight Arctic states to reach consensus at the biennial Ministerial meeting cast shadows over prospects of continued circumpolar cooperation and raised serious questions about means and ways of moving forward. It is thus important to reflect on the implications of the meeting—both with respect to its direct consequences for the Arctic Council as well from a broader perspective of the adequacy, suitability and the effectiveness of existing institutional arrangements in light of trends underpinning today's international affairs and vis-à-vis challenges posed by combined forces of climate change and globalization.

From the Periphery to the Center of Global Politics

To begin with, the view of the role and position of the AC has substantially evolved over the last two decades, among Arctic and non-Arctic actors alike. As a systematic comparison of the AC Ministerial Declarations shows, the Council began its work as a "high level forum to provide a means for promoting cooperation, coordination and interaction among the Arctic States" (*Declaration on the Establishment of the Arctic Council*, 1996, hereinafter the Ottawa Declaration). It evolved to consider itself "a unique partnership among Governments and organizations representing

Indigenous Peoples and communities in the Arctic" (Arctic Council 2002), and later, as "an important forum for increased mutual understanding and cooperation in the circumpolar area" (Arctic Council 2006). Later, it sought to become the leader on Arctic challenges and opportunities (Arctic Council 2009) and "in taking concrete action to respond to [those] new challenges and opportunities" (Arctic Council 2013). Finally, a year after its 20th anniversary, in the Fairbanks Declaration from 2017, the Council was named "the preeminent intergovernmental forum for the Arctic Region" (Arctic Council 2017).

In parallel to all those developments, the ranks of Arctic ministers grew accordingly, and while the Ministerial Meeting in Nuuk in 2011 was the first attended by a sitting U.S. Secretary of State, the Ministerial Meeting in 2017 was the first one where all Arctic states were represented exclusively by their ministers of foreign affairs, giving evidence to the elevated status of the event, which would have been difficult to conceive when the Council was founded in 1996.

The fact of bringing ministers of foreign affairs of all eight Arctic states around the same table has underlined the importance of the Arctic Council and served as the primary illustration of the steadily growing interest in the Arctic and position of the Arctic on the domestic agendas of all AC members. This elevated diplomatic importance also means that Arctic issues have become increasingly considered from the perspective of the overall foreign policies of Arctic countries, rather than in isolation, and with a higher regard for regional characteristics and nuances of regional cooperation.

As the recent case of the United States' positions at the recent AC Ministerial meetings has shown, these policies can occasionally undergo sweeping changes. This year's U.S. position stands in stark contrast to the efforts of the Obama administration's Arctic policies and in particular its conduct during the U.S. Chairmanship of the Arctic Council (2015-2017). During that time, the U.S. sought to balance concerns with regard to environmental protection, climate change, and sustainable development in the North. In geopolitical terms, it sought to insulate Arctic collaboration from the spillover of tensions following Russia's annexation of the Crimea in 2014. The current U.S. leadership decided to bring the Arctic in line with its overarching stance in global affairs, including an intensification of conflict with Russia, China, and the withdrawal from international multilateral forums dealing with climate change.

The shift with regard to climate change, albeit not surprising in light of repeated claims by President Trump on the matter, is nonetheless particularly striking, given the unrelenting pace, scale and the observable effects of climate change in the region as well as the centrality of the issue to the work of the Arctic Council. Since the early 2000s and the Arctic Climate Impact Assessment (ACIA), which was launched and largely funded by the United States, climate change has been at the core of the AC activities and discussions and a key to the evolution of its substantive agenda (ACIA, 2004, 2005; Fenge, 2013; Rogne, Rachold, Hacquebord, and Corell 2015). Moreover, at the ministerial meeting in Fairbanks, Alaska in 2017, in the first months of the Trump administration, the United States ultimately agreed to and signed onto a statement that included wording regarding the 2015 Paris Agreement, the United Nations Sustainable Development Goals (SDG), and "the need for action on all levels" to reduce both long-lived greenhouse gases and short-lived climate pollutants. Notwithstanding, two years later, in accordance with its newly adopted policy of skepticism and denial about the causes and severity of climate change, the United States single-handedly broke from other Arctic countries in its approach, much in the same fashion as it decided to pull out from the Paris Agreement and refused to take part in the negotiations prior to the UN climate summit in New York in September 2019 (Lynch and Gramer 2019).

Viewed from a broader perspective, the Arctic Council Ministerial meeting in Rovaniemi, and notably the behavior of the United States, unveiled the vulnerability of international institutions in light of unilateral shifts resulting from radical changes in various countries' domestic political scenes. Historically speaking, a somewhat similar situation had already taken place in the AC, again with regard to the United States and the final negotiations and release of the aforementioned ACIA. At that time, the difference was notable between the start of the assessment process that corresponded with climate policies of the Bill Clinton administration and the delivery of the final ACIA report and formulation of its policy recommendations that became subject of contentious negotiations in 2003, during the presidency of George W. Bush, who was much less receptive to concerns over climate change and its implications (Nilsson 2007; Stone 2015). Yet this time in Rovaniemi, the opposition from the United States concerned more than simply a few disagreements with the detailed recommendations from the report. The U.S. administration went so far as

to resist any mention of climate change whatsoever, despite the unequivocal scientific consensus on the issue and the increasing sense of urgency to take action (AMAP 2017, 2019; IPCC 2018) expressed by increasingly vocal public opinion in societies worldwide.

As Iceland takes up its second Chairmanship of the AC "without the clear alignment of purpose and interests that past Ministerial Declarations have reflected" (Balton and Ulmer 2019: 1), it is vital to ask a question: What are the consequences of these events and developments, and what does it tell us about the future of Arctic governance?

Into the Future

I believe that, in light of the above, there are four issues worth pointing out and considering as we move forward.

The first, directly related to the Arctic Council's purpose and mission, concerns Indigenous Peoples and their position and role in regional politics. It is important to note that the 2019 Rovaniemi meeting marked a departure from previous practices of circumpolar collaboration in more than one way. Not only did the Arctic Council fail for the first time to issue a ministerial declaration, but also for the first-time tense negotiations over the compromise language that would have allowed the Arctic Council's Finnish Chairmanship to issue a final statement did not leave space for the text to be fully consulted and agreed with Permanent Participants, as was the case in the past. The involvement, strong voice, and positions of Arctic Indigenous Peoples have been a hallmark of the Arctic Council since its establishment. The arrangement under which a number of Indigenous Peoples organizations are recognized as Permanent Participants until present remains an innovative and largely unprecedented one among international institutions and organizations (Arctic Governance Project 2010). The engagement of Arctic Indigenous Peoples has been emphasized as a way to lend the AC legitimacy, credibility and moral standing that the body could not achieve in their absence (Axworthy and Dean 2013; Fenge, 2012). At the same time, it has been recognized as a governance feature with important impacts for both Indigenous Peoples and the institutions in which they participate (Young 2009). Therefore, whereas this arrangement was agreed at the time when the Arctic was a region of low interest, low stakes, and low politics, it remains of fundamental importance for all actors

engaged in the AC that the "active participation and full consultation with the Arctic Indigenous representatives within the Arctic Council" (Ottawa Declaration) remain unaffected and are not compromised in the course of interstate negotiations, but rather preserved and strengthened when the political stakes in the Arctic grow, interest in the region increases, and the Arctic turns into an arena of high politics.

Second, while the conflictual speech of Secretary Pompeo, together with the ultimate inability of all Arctic states to agree on a joint Ministerial declaration, overshadowed the course of two days in Rovaniemi, other developments took place there as well. These included signing a memorandum of understanding (MoU) between the Arctic Council and the Arctic Economic Council (AEC), chaired by the Icelandic representative throughout Iceland's term at the helm of the Council until 2021. However, due to the highly politicized and polarized character of the meeting in Finland, the signing of the MoU between the AC and the AEC received little or no attention, despite the increasing level of economic activity and investments in the region. What I believe is worth pointing out in this context is the emerging disconnect between the institutional developments in the region, in particular the AEC, and major business projects and partnerships moving forward. To name only one, the increasing rate of cooperation between Russia and China concerning the development of the Northern Sea Route (NRS) and of the oil and gas reserves in the Russian North takes place entirely on a bilateral basis, with no connection to the progressing work of the Arctic Economic Council, the Arctic Investment Protocol, or other institutions. This raises many questions, including the place and role of the AEC and other multilateral forums in discussing prospects and influencing a trajectory of the economic development in the North.

Third, a matter of significant interest to future discussions of Arctic politics and their consequences beyond the Arctic Circle latitude is the rapidly evolving dynamics among the United States, Russia, and China in the region. As the global geopolitical landscape is shifting—with China as an emerging superpower, a resurgent Russia, and the increasingly defensive and isolated United States (Young 2019)—the Arctic becomes an important arena to observe the development of relations among the three countries. In contrast to the time of the Cold War, the militarization of the Arctic was primarily a reflection of geopolitical circumstances playing out outside of the region. However, the situation unfolding today in the North is not

only mirroring these broader geopolitical trends, but due to the critical importance of the Arctic to the Russian economy and China's growing demand for energy resources, among other factors, it also carries much greater potential to influence or shape future events and alliances.

Finally, as the links between the region and the global system are becoming tighter and tighter, I believe it merits space to pose questions about the adequacy, effectiveness, possibilities but also the limits of this broader governance architecture vis-à-vis challenges posed by the combined forces of climate change and globalization. The refusal of the U.S. to sign onto the Arctic ministerial statement over the inclusion of issues related to climate change came at a point where the scale and character of a multitude of changes observed in today's world represent nothing short of a fundamental transformation of the Earth's system. Humans and their biophysical environment more closely connected than ever before, since humanity has evolved to become a force of geological order, able to influence global geophysical systems and dominate ecosystems on a global scale (Steffen, Sanderson, Tyson, Jäger, and Matson 2004). Biodiversity—the diversity within species, the number of species, and the number of intact ecosystems—is presently declining at least tens to hundreds of times more rapidly than at any time in human history (IPBES 2019). On May 13, 2019, as reported by the Scripps Institution of Oceanography, the concentration of CO_2 in the atmosphere reached more than 415 parts per million (ppm), the highest level since prior to the evolution of Homo Sapiens (Scripps Institution of Oceanography 2019). Human-caused climate change serves as perhaps the most prominent example of the influence of humans on the Earth's system, as well as an illustration of challenges that transcend the boundaries and capacities of any state and any single actor. Accelerating globalization continues to exacerbate cross-border environmental problems, making it effectively impossible to shield spatially delimited areas from the impact of forces operating at larger scales and to address emerging issues in isolation (Young 2017b)—in the Arctic as elsewhere. As noted by international relations and legal scholars, the complexity of this new global environment has outpaced traditional methods of international law-making and raised doubts about their continued utility (Chinkin 2000; Reinicke and Witte 2000), demanding novel responses and mechanisms adequate to meet arising governance needs, many of which exceed typical regulatory functions (Young 2017a).

In many ways, the Arctic serves as a microcosm of developments

unfolding in the global arena. As if through a wide-angle lens, we observe in the Arctic the characteristics of complex systems, where forces operating in one part of the Earth system can trigger unintended consequences in its more distant parts; where various components of Arctic socio-ecological systems are linked in ways that effectively preclude dealing with them in isolation; and where the region is increasingly tightly connected with the rest of the world through both bio-geophysical, economic, and geopolitical links. It can be said that the Arctic has emerged as a governance barometer, an area indicative of the growing need for innovation in governance systems in a world ultimately being altered through processes of climate change and globalization (Arctic Governance Project 2010).

By contrast, in his remarks at the Ministerial meeting in Rovaniemi, Secretary of State Pompeo stated that "the United States wants multilateral institutions that hew to their missions and serve the interests of the nation-states that created them" (U.S. Department of State 2019). As the Ministerial gathering and the broader U.S. agenda has shown, these interests might be formulated very differently, and sometimes narrowly, at different points of time. However, the increasingly interconnected nature of challenges and responses to them, including among all North Pacific Arctic and non-Arctic states, calls for considering mechanisms allowing for longer term stabilization and cooperation. As far-reaching as it sounds, in consequence of man-made climate change, sustainable development, and the well-being of all countries have become interconnected on a previously unseen scale. Thus, as the NPAC 2019 and beyond focuses on nesting the Arctic into the evolving global system, I argue that the broader consideration of the limits of the existing overarching governance system —as well as means for overcoming them—deserves increasing space and attention.

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PART II

THE FUTURE OF GREENLAND: POLITICAL AND ECONOMIC IMPLICATIONS FOR THE ARCTIC

Greenland Matters: In the Crosscurrents of Arctic Change

Mark Nuttall

Introduction

In August 2019, U.S. President Donald Trump caused a stir by suggesting he would like to explore the idea of buying Greenland from Denmark. This provoked intense international media interest, and numerous op-eds and articles promptly appeared in print and online news outlets. Greenland was attractive to the United States, it was suggested, because of its enormous mineral wealth and its geostrategic position in a rapidly changing Arctic. Greenlandic and Danish leaders quickly dismissed the idea of an American purchase, and Trump cancelled a planned visit to Denmark. What stood out in much of the reporting was how little appears to be known by the wider world about Greenland and its contemporary politics, economics, and social and cultural dimensions, its geopolitical history, and the realities surrounding resources and extractive industries. In September 2019, an article in *The Wall Street Journal* felt it necessary to explain to the reader that Greenland "is located east of Canada between the Arctic and Atlantic Oceans."

A self-governing territory and constituent part of the Kingdom of Denmark (Denmark does not own Greenland, despite Trump's apparent view of it as a large piece of real estate), Greenland is in the crosscurrents of Arctic change and is assuming sharper international visibility and geopolitical prominence. The effects of climate change on the country's massive ice sheet, plans for resource development, conservation challenges, ambitions for greater autonomy, and sovereignty and political security issues are attracting greater attention. As ice is melting, traditional hunting and fishing livelihoods are becoming increasingly precarious, international companies are scoping out the potential for extracting minerals and hydrocarbons, and tourism is growing. Greenland is a dynamic, urbanizing country and is mapping out trajectories for greater self-government, a stronger say in foreign policy, and possible independence, most recently marked by work of *Tunngaviusumik Inatsisissaq pillugu*, Greenland's constitutional commission, toward the drafting of a Greenlandic

constitution.

Greenland matters to the world and for action concerning Arctic sustainability, climate change and environmental protection, as well as Indigenous rights, entitlements, and security in the circumpolar North. In this chapter, I outline some of the key environmental, political and economic circumstances that are contributing to the shaping of Greenland as a modern Arctic nation. While not a comprehensive review, I consider a number of themes of contemporary concern, including self-government and sovereignty, the economy and debates about sustainability, the politics of extractive industries, climate change, urbanization, the future of small communities, and Greenland's relations with Denmark (and Greenland's place within the Danish Realm.)[1]

Colonization, Assimilation and the Emergence of a Greenlandic Nation

In 1721, Hans Egede, a Norwegian-Danish Lutheran priest, arrived on Greenland's southwest coast and established a trade and mission station near the site of present-day Nuuk, Greenland's capital. Egede's activities marked the beginning of more than 230 years of Danish colonial rule over Greenland's Indigenous Inuit inhabitants (Greenland was more accurately part of the Dano-Norwegian realm until it was ceded entirely to Denmark in 1814). Hoping to establish a viable and lucrative trade network based on marine mammal products (mainly seal and whale oil, baleen, and sealskins), dried and salted fish, and fox furs, the colonial authorities assumed responsibility for trade in 1726 and transferred trading rights in Greenland to independent Dano-Norwegian companies, such as the General Trade Company. This proved unsuccessful and unprofitable in the long-term and the Danish government formed the *Kongelige Grønlandske Handelskompagni*, or KGH (Royal Greenland Trade Company) in 1774, thus establishing a Danish trade monopoly in Greenland that was to last until after the end of World War II.

By 1814, most Greenlanders along the west coast were involved in this trading economy, and significant changes to Inuit society and culture had occurred. Yet hunting and fishing lifestyles persisted, based on harvesting seals, other marine mammals, and fish, such as cod, herring, capelin and halibut. Indeed, they were essential to KGH trade activities, which were

underpinned by the ready availability of sealskins, furs, blubber, and fish supplied by the hunting outposts that had been established from the Nanortalik district in the south to the Upernavik area in the northwest.

Some Inuit populations, however, had little or no contact with Europeans and remained relatively isolated. British Royal Navy officer John Ross and his expedition ships visited the Inughuit of northwest Greenland in 1818. While the Inughuit had other contact with explorers and whalers throughout the 19th and early 20th centuries, the local population was more or less excluded from official Danish government trading activities. Other parts of Greenland remained even more isolated; British Royal Navy Captain Douglas Clavering met a group of Inuit in northeast Greenland in 1823 (this is the only recorded contact between northeast Greenlanders and Europeans in what is now—except for the presence of weather station personnel and the Danish navy's Sirius Dog Sled Patrol—an uninhabited part of the country), and in 1884 Danish naval officer Gustav Holm wintered with people in what is now the Tasiilaq region on the east coast.

The idea of Greenland as a country, and of Greenlanders (at least, those who were living along the west coast) as a people with a distinct identity and shared sense of history inhabiting an emerging nation, took shape during the 19th century. The establishment of a printing house in Nuuk during the 1850s was important for West Greenlandic to develop as a written language. The newspaper *Atuagagdliutit* ("distributed reading matter") was first published in 1861. Founded by Hinrich Rink, its first editor (from 1861-1874) was Greenlander Rasmus Berthelsen. *Atuagagdliutit* was not only a source of news in Greenlandic about Greenland, Denmark, and the outside world, it also paved the way for the beginning of a Greenlandic literary tradition, contributed to the idea of Greenland as a nation, and gave a voice to those who argued that Greenlanders should be involved in governing their own land.

The impact of the outside world on Greenland greatly intensified during and following World War II. Prior to the war, Denmark had allowed only limited foreign access to its vast Arctic territory. But after Nazi Germany occupied Denmark in 1940, Greenland became a temporary American protectorate following negotiations in April 1941 between the U.S. government and the Danish ambassador to Washington. Air bases were constructed and thousands of American military personnel were stationed in Greenland. After the war, Denmark ended its isolationalist policy toward Greenland and began a process of modernization and assimilation. Colonial

status was superseded in 1953 when Greenland became an integral part —officially a county—of the Kingdom of Denmark, giving Greenlanders representation in the Danish Parliament.

The ending of colonial rule marked the beginning of another era characterized by profound and extensive social, economic and political changes and upheavals in Greenlandic society. Improved health care aided population growth, and economic development policy focused on a commercial fishing industry, but the aim was to turn Greenlanders into Danish citizens, the Danish language was privileged over Greenlandic, and a number of Greenlandic children were separated from their families and sent to school in Denmark. During the 1960s, Denmark implemented controversial policies of centralization and urbanization in Greenland: many people were moved from small, remote settlements and relocated in the growing west coast towns, including Nuuk, Maniitsoq, Sisimiut, and Paamiut, where investment in the development of the fishing industry and provision of services was largely concentrated. The number of Danes sent to work in Greenland as administrators, teachers, doctors, nurses, police officers, managers in the fishing industry and other businesses, technicians and construction workers increased significantly. In recent years, the controversies, legacies, human rights abuses, and trauma of Denmark's colonial and post-colonial policies implemented in Greenland have been under scrutiny through the work of the Greenland Reconciliation Commission (*Saammaateqatigiinnissamut Isumalioqatigiissitaq*; see www.saammaatta.gl), which was appointed by the government of Greenland (the Danish government did not participate in the commission's work) and released its final report in December 2017.

Self-government and Possible Independence

These social and economic transformations contributed to the politicization of Inuit culture, expressions of Indigenous identity, the formation of political parties, and the beginnings of a movement for Home Rule. Denmark acknowledged a growing dissatisfaction felt by Greenlanders and recognized that a change in its relationship with Greenland was necessary. A Home Rule Commission was set up in 1975, followed by the passing of the Home Rule Act three years later. Greenland Home Rule was established by referendum in January 1979, and the election for the first Greenlandic

parliament was held in April of that year. Legislative and administrative powers in a large number of areas and public institutions were quickly transferred to the Home Rule authorities. Greenland left the European Economic Community (EEC) in January 1985 (it had joined with Denmark in 1973, but decided to leave mainly over disagreements with the Common Fisheries Policy), but negotiated Overseas Countries and Territories Association status (OCTA), which allows favourable access to European markets (e.g. a fisheries agreement between Greenland and the European Union (EU) is renegotiated every five years).

On 25th November 2008, 75.5 percent of those who voted in a referendum on self-governance favoured greater autonomy and, on 21st June 2009, the new political arrangement of Self-Rule was instituted. The Greenlandic Parliament—*Inatsisartut*—convenes in autumn and spring and has 31 members who are elected for a period of four years; *Naalakkersuisut*, the Greenlandic government, is headed by the premier and the cabinet.

The Act on Greenland Self-Government is an extension of the powers enacted in the 1979 Home Rule Act and allows Greenland to request that further powers be devolved from Copenhagen to Nuuk in areas that are currently under the control of Denmark. The following fields of responsibility cannot be transferred to the Greenland authorities until Greenland becomes an independent state: the constitution; foreign affairs (with the modifications and exceptions mentioned in the Legal Act no. 473, chapter 4); defence policy and national security; the High Court of Justice; citizenship; and monetary and exchange rate policy (Act on Greenland Self-Government, Act no. 473). However, Greenland has already started to represent itself on the international relations stage, with representatives in Copenhagen, Brussels, Washington, D.C. and Reykjavik (in 2005, the Danish Parliament granted Greenland limited statutory powers to negotiate some international agreements on behalf of the Kingdom of Denmark). Greenlandic (*Kalaallisut*) is the country's official language, and debates about making English (rather than Danish) the first foreign language Greenlanders learn in school centre around discussions of how Greenland meets the challenges of globalization and the country's place in the wider world. The Self-Rule agreement also recognizes that Greenlanders are a nation with an inherent right under international law to political independence if they choose it. Greenland's constitutional commission was established in April 2017 and is tasked with preparing

a draft of a constitution that would be the legal basis for an independent sovereign Greenlandic state. The draft constitution is to be submitted to Naalakkersuisut on 21st June 2021 so that it can be presented to Inatsisartut for discussion and debate during the 2021 autumn session. If approved it would come into force should Greenland become independent.

Despite the challenges ahead, and irrespective of whether it will lead to eventual independence, Self-Rule is a form of governance that allows the expression of a growing cultural and political confidence in a country of just under 57,000 people, more than 80 percent of whom are Inuit. Greenland has often been considered a model for Indigenous self-government, but Home Rule set in motion a nation-building process, and Self-Rule can be seen as a process of state formation. The relevance of Greenlandic self-government goes beyond that of self-determination for Indigenous Peoples in the Arctic and says much about aspirations for autonomy in small political jurisdictions and stateless nations around the world.

But questions dominate Greenlandic politics about how the country will pay for the other responsibilities it has started to take over (and could assume decision-making authority for) from the Danish state and how it will lay the foundations for a sustainable economy. Greenland receives some 60 percent of its budget revenue in the form of an annual 3.5 billion DKK (around €470 million and USD 514 million) block grant it receives from Denmark, as well as Danish state expenses of roughly 1.2 billion DKK (roughly €160 million and USD 175 million). Greenland's economy remains highly dependent on exports of cold-water shrimp and fish (mainly Greenland halibut, although cod and snow crabs are also important catch species). The main challenge to securing greater self-government and economic independence is to replace the block grant and other Danish state transfers with revenues generated from within Greenland. This requires the development of new economic initiatives, industries, and commercial enterprises, as well as investment in education and training. In short, aspirations for independence would require Greenland to embrace globalization further.

A poll carried out in 2016 by HS Analyse for the Greenlandic newspaper *Sermitsiaq* suggested there is strong support for independence, although those surveyed who were in the 18-29 age group were more skeptical about whether it could and should be achieved than people in their 60s. However, while the results of a recent opinion poll conducted

by the Universities of Copenhagen and Greenland indicated that some 67 percent of Greenlanders were in favour of independence, 46 percent of respondents said they would not vote for independence if a referendum were to be held within the next 10 years. Aspirations for greater autonomy are seemingly tempered by concerns that it may be another generation or two before independence may be realistic or even desirable. Fewer people, it seems, would be prepared to accept independence if it meant lowering living standards and ushering in a period of economic hardship.

Subsurface Resources

Much of the debate prior to the referendum on Self-Rule centered on what Greenland's ownership of subsurface resources would mean for greater autonomy and possible independence. The Danish-Greenlandic Self-Rule Commission, which was established in 2004, negotiated the terms of greater self-government and concluded that minerals in Greenland's subsoil belong to Greenland and that the country has a right to their extraction and to revenues from non-renewable resource development. Under the Self-Rule agreement, any income generated from mining and hydrocarbon development would be administered by Greenland, with the level of the block grant being reduced by Denmark by an amount corresponding to 50 percent of the earnings from minerals and energy extraction once they exceed 75 million DKK (~USD 11 million). Future revenues from oil and mineral resources would then be divided between Greenland and Denmark, while the annual block grant would be reduced further and eventually phased out.

Greenlandic politics continues to be closely influenced by the role and extent of the extractive sector. Yet, the resource boom that many have anticipated—and about which many Greenlandic politicians and business leaders have been excited—has not yet happened. Nonetheless, and despite a fall in global commodity prices over the last few years, as well as the effects of other global processes on plans for resource development in the Arctic, the subsurface (including the sea bed) remains critical for Greenlandic notions of nation-building and state formation. Recent reports and assessments (e.g. such as the *To the Benefit of Greenland* report) have questioned the feasibility of relying too heavily on extractive resource projects, and a dip in global markets in recent years has thrown

cold water on the enthusiasm of some international companies to work in Greenland. However, developing a mining industry and encouraging oil and gas exploration have remained stated aims of the various coalition permutations of the Greenland self-rule government over the last few years, as politicians push forward with strategies for reducing dependency on Denmark, forging a sustainable economy, and enhancing Greenland's agency in international politics. A ruby and pink sapphire mine near Qeqertarsuatsiaat in southwest Greenland and an anorthosite mine southeast of Sisimiut are currently operating. An exploitation licence has been granted to the Australian company Ironbark to develop a lead-zinc mine in Citronen Fjord in Peary Land in the country's far north, while Greenland Minerals and Energy and TANBREEZ (also Australian companies operating in South Greenland) are awaiting decisions relating to their applications for exploitation licences for their respective uranium and rare earth metals projects. A large ilmenite (an iron titanium oxide) mine near Moriusaq in Northwest Greenland is also going through the final stages of the permitting application process, and exploitation will see it extracted from coastal sand. A new hydrocarbon strategy for 2019-2023 is currently under discussion and subject to public hearings.

However, extractive industries and public participation in decision-making processes concerning the development of subsurface resources remains a contested political, economic, social, and cultural issue (Nuttall 2017). Exploration activities animate fraught political and public discussions concerning sustainability, and include voices—Inuit Circumpolar Council-Greenland and local non-governmental organizations have been especially critical—that wonder if a Greenlandic future that includes oil and mineral extraction can be considered sustainable. Many people feel they are not sufficiently informed or consulted about the potential impacts of future oil, gas and mineral extraction projects, and that local views and concerns are not adequately included in social and environmental impact assessments (e.g. Nuttall 2016).

Climate Change

Another area of obvious global impact on Greenland has been the accelerated impact of climate change, since the melting of Greenland's ice sheet will have considerable effect on the world's weather and on global

sea level rise. Scientific research is documenting the rapid ice-mass loss of Greenland's inland ice sheet resulting from oceanic and atmospheric forcing (e.g. Bevis et al. 2019), a greater summer melt of its edges and surface areas (e.g. Box and Decker 2011), and the retreat of large outlet glaciers (e.g. Carr, Vieli and Stokes 2013). Large amounts of ice mass are turning to meltwater and flowing away towards the coast from Greenland's interior as streams and rivers, and are contributing to global sea level rise (Haubner et al. 2018). Increased meltwater runoff from glacial fronts is affecting water temperature and circulation patterns as well as the formation, thickness and break-up of sea ice (MacFerrin et al. 2019). This meltwater has been found to contain dissolved organic carbon, making the Greenland ice sheet an important source of organic carbon entering the Greenland and Labrador seas (Lawson et al. 2014). Cryoconite, which is sediment found on the surface of the inland ice and its glaciers, contains windblown dust particles from Asian deserts, volcanic eruptions and industrial activity (e.g. Biscaye et al. 1997). This dark matter and the microorganisms found in the water that accumulates in cryoconite holes lower ice albedo and contributes to melt. The inland ice has long been subject to deposition from windblown dust and the black carbon particles originating from anthropogenic activity occurring far away from the Arctic, but Greenland's melting glaciers are now also a source of high latitude dust emissions, with impacts on terrestrial, cryospheric and aquatic environments (e.g. Bullard and Mockford 2018; Tobo et al. 2019).

The entire landfast ice regime of northwest Greenland has also undergone significant changes over the past few decades. Thinning and diminishing ice cover has far-reaching impacts on hunting and fishing activities, on mobility, and on local economies, since the marine ecosystem supports the livelihoods of many people in the region. Projections of future sea ice melt in northwest Greenland point towards continued declining drift ice in Baffin Bay and the decline and continued thinning of landfast ice.

These and other climate changes hinder local efforts toward achieving and maintaining sustainable livelihoods. Local communities in northwest Greenland, for example, are being forced to adapt to changes in the availability, abundance and distribution of living resources. For instance, Greenland halibut are moving further north while seals are becoming scarce in some community waters. A significant question that needs addressing is how political, economic, and institutional barriers to adaptation to such changes and shifts in ecosystems affect local livelihoods. The effects of

climate change have to be understood in a wider context of other drivers of social and economic change, as well as how they may be magnified by environmental governance and wildlife management. For hunters and fishers, everyday life is circumscribed by the institutions of wider Greenlandic society and the regulations and quotas that are implemented by management systems for living marine resources. In combination with environmental and climate change, these affect traditional hunting and fishing practices, placing limits on harvesting and procuring certain species. Navigating one's way around quota systems and wildlife management regulations can often be more difficult and frustrating than seeking out alternative travel routes when confronted with unsafe winter ice. This is often unexamined in political discourses and economic narratives about sustainability, resource use, and the future of Greenland's small villages. Furthermore, the presence of exploratory activity related to extractive industries has brought different kinds of pressures and anxieties for local people, as well as hopes for the future (Nuttall 2019). As Greenland warms and becomes less icy, the underground and the sea bed are being probed for minerals and hydrocarbons which, if developed on a large scale, may see a significant presence on the island of companies whose activities could contribute to further environmental change and climate warming.

Urbanization, the Growth of Nuuk, and the Future of Small Communities

The anticipatory politics concerning a future Greenland (and various dreams of what that future could look like) play out in Nuuk, Greenland's capital. Geopolitics, geo-economics, geophysics, urbanization, major construction projects, business initiatives, and environmental change make their co-presence increasingly felt in this busy and rapidly changing city of nearly 18,000 people, almost a third of Greenland's total population. New buildings are being constructed, while older apartment blocks built rapidly in the 1960s and 1970s to house people relocated from smaller communities are being demolished, mainly because of structural and environmental health concerns (although this also represents a gradual erasure of buildings that are symbols of Danish centralization policies and the social problems that resulted). New suburbs are being constructed: Qinngorput, five kilometres from Nuuk city centre, has the potential

capacity for 10,000 residents once completed, while a new district at Siorarsiorfik, further around the coast from Qinngorput, is currently at the planning stage. A new container harbour has recently been built, and planning has been approved for the expansion of the city's airport, with the aim to accommodate transatlantic airliners. This would allow for direct routes from Nuuk to Copenhagen and other international airports, as well as making it the hub for domestic air traffic, and so replace Kangerlussuaq, which is currently the country's main entry point. However, the airport development has been deeply divisive. The question dominating debate has been whether to expand the existing runway and redevelop the terminal and associated facilities (effectively bringing the airport closer to the city and residential areas, and so local residents have expressed concerns over noise and public health), or to build a new airport south of Nuuk (for which there appeared to be large public support, but would present a significantly greater construction challenge). In summer 2019, the decision was taken to expand the existing infrastructure.

A number of businesses have emerged that provide services in consultancy and logistics for mining and oil companies, while a number of those companies have set up Greenlandic subsidiaries and maintain offices in the city. Nuuk is also developing as a centre for Arctic research, with plans for expansion of its science and education institutions and its environmental monitoring and assessment programmes. City planners and business leaders imagine an urban, Arctic metropolis, with greater global connectivity, embedded in international networks of trade, business, information technology, and energy, and which could have a population of 30,000 within the next couple of decades. Expanding Nuuk and other larger towns requires a great deal of investment, and supplying towns and villages spread along a vast coastline involves enormous cost. As a distribution hub for essential supplies that come from many parts of the world via Denmark, Nuuk's harbour is a store for hundreds of containers embossed with the Royal Arctic Line logo (with the tag-line "a lifeline to society in Greenland"). As Nuuk grows, however, planning for the future assumes that many people who live in the smaller coastal settlements will eventually move to the capital. And travelling outwards from Nuuk, there is plenty of evidence of population loss and migration away from smaller settlements to the capital, to other larger towns, and to Denmark.

While Nuuk grows, many smaller settlements are experiencing a population drain, mainly of young women. The reasons for migration

from small communities to Nuuk and other large towns of Greenland—and often on to Denmark—are complex and multifaceted, and include responses to employment opportunities, education, and lifestyle choices, as well as a changing environment. For instance, Kangersuatsiaq, a village in the Upernavik district of northwest Greenland, was once a place renowned throughout northern Greenland for its "young, aspiring population" and considered a model for the sustainability of small communities (Nuttall, 2017). Today, around a third of the houses are now empty, as young people (and entire families) have moved to Upernavik town, to other villages in the district, or on to Nuuk and other towns. One reason for this, although not the only one, is that the village's fish processing plant was closed down in 2011 because of the difficulties of providing it with a supply of fresh water. Kangersuatsiaq is on a small island with no source of fresh water other than from the icebergs that surround it. This lack of access to fresh water is a problem for other small settlements in the district, where homes have no running water—a great irony in a country where so much fresh water is locked in ancient ice (and when greater effort is being given to business propositions to export glacial ice than to secure the provision of water for remote communities in Greenland). As pointed out above, dramatic changes to sea ice have brought problems for hunters and fishers in winter and spring; fishing has declined in importance and the people who remain in Kangersuatsiaq have returned to a life based mainly on hunting, yet one that is precarious, with an uncertain future, given these environmental shifts and Greenland's political, economic and demographic trajectories (Nuttall 2017, 2019).

Although the economic significance of what is seen as a traditional way of life based on hunting and fishing that has sustained small communities is steadily decreasing, the idea of traditional life remains a crucial constituent of Greenlandic culture and identity for many people. Yet the widening divide between town and village life (and the differences in living conditions, services and infrastructure) has come to stand for and perhaps define political and economic development in Greenland. Indeed, the very notion of a sustainable future Greenlandic society is a challenging one; goods and supplies are expensive to ship from Denmark and ferry up to the sparsely-populated north and to the east coast, for example, and currently rely on Danish subsidies. Yet without those supply chains and subsidies, current lifestyles in more remote communities in Greenland would be unsustainable.

Today, there are many politicians in Greenland who would like to see the country's population concentrated in a few main towns on the west coast, and urban growth is often a key topic of debate for Inatsisartut. While few would publicly admit that it would be better to close some hunting and fishing communities and relocate their inhabitants to larger villages or towns, the reality is that throughout the period of Greenlandic political autonomy, from Home Rule to the present form of self-government, hunting livelihoods and hunting communities (while informing debates and nourishing discussions about Greenlandic cultural identity) have seldom been thought to contribute much to the modern national economy. In reality, it has been costly for Greenland's government to maintain a system of subsidies for those smaller communities dependent on harvesting the living resources of sea and land (Nuttall 1992).

Security Issues and Greenland's Geostrategic Position

Greenland's rapidly evolving political landscape and its economic development trajectory play a critical role in Danish-Greenlandic relations. Without Greenland, Denmark will cease to be an Arctic state, as Denmark and the Faroe Islands would no longer sit as members of the Arctic Council if Greenland becomes independent. It has been argued that Danish presence in Greenland is crucial for Denmark's wider foreign policy strategy, which rests on both a European and an Atlantic pillar, although Danish interests in securing stronger relations with the United States have threatened to overshadow Danish support of the EU at times (e.g. Rahbek-Clemmensen 2011). With nothing to gain economically from Greenland, Denmark's Arctic territory still provides leverage for political influence, especially with the United States. Greenland has been central to Danish foreign strategy since World War II, evident in the Danish Defence Agreement between Denmark and the United States of 9th April 1941, which was extended and elaborated on 27th April 1951. During World War II, Greenland and the Faroe Islands were important strategically to the Allied Nations for control over the northern North Atlantic, while Thule Air Base in northern Greenland became vital as a Cold War strategic air and missile base (the U.S. had offered to buy Greenland from Denmark in 1946). As an Arctic state, it is through Greenland that Denmark is able to position itself as a key player in world affairs (hence its continued emphasis on Arctic issues

as being global issues). In particular, Danish relations with the U.S. must be understood in part through historical and current U.S. geopolitical interests in Greenland and how far Denmark is able to influence America's position on the Arctic. But Danish-U.S. relations must also be understood with reference to a shift in Denmark's overall foreign and security policy since the 1990s.

Greenland has no military of its own, and relies on the Danish military presence in the form of its Arctic Command in Nuuk that until recently was known as Greenland Command and was based at Grønnedal in southern Greenland. The Sirius Patrol in northeast Greenland is one of its units (Sirius originated as the Northeast Greenland Sledge Group, set up with assistance from the U.S. Coast Guard in 1942). These defence forces were traditionally responsible for surveillance of Greenland's seas, lands and air space, the maintenance of sovereignty and, in the case of Greenland Command, fisheries inspection.

In recent years, the Danish Defence Commission has called for a greater military presence in the form of surveillance and naval patrol operations to protect territorial boundaries. In June 2009, eight political parties in the Danish *Folketing* signed an agreement on defence policy, which recognized Greenland's geostrategic position and called for appropriate Danish security policy responses to other new security-related needs. Organizationally, one of the most significant changes was the creation of a single Danish Arctic Command and establishment of an Arctic Response Force. Denmark has also indicated its interest in using Thule Air Base for sovereignty and surveillance patrols by both its Air Force and Navy.

The new Command was established in October 2012 by merging the Greenland Command with the Island Command Forces (ISCOMFAROES), the military unit based on the Faroe Islands. From its base in Nuuk, Arctic Command continues to be responsible for fisheries inspection and for search and rescue (it acts as the maritime rescue coordination centre for the Greenlandic search and rescue region), as well as with surveillance, defence and maintenance of territorial sovereignty. It also has a broad mandate to carry out quasi-civilian tasks in connection with maritime activities. These include anti-pollution and spill-recovery activities in the open ocean, providing ice-breaking support to local companies, carrying out hydrographic surveys, and monitoring commercial activities in Greenlandic waters. Related to these responsibilities and tasks, Arctic Command faces emerging challenges from a number of directions: increasing mining and

resource exploration and development, new shipping routes, an increase in tourism (specifically greater numbers of cruise ships), and from an expansion of scientific research. As a member of NATO, Denmark has also been involved in the formation of a Nordic alliance that includes fellow NATO member Norway, partners Finland and Sweden, and Greenland, the Faroe Islands and the Aland Islands (Finland). This alliance conducts joint monitoring of Nordic marine areas, Nordic air space, and the Arctic. Rahbek-Clemmensen (2011) argues that Denmark's "central policy-makers have already realized that their own military means will never be enough to hold on to Greenland" and the importance of such regional institutions and alliances may be critical if Denmark is to maintain its union with Greenland and retain its status as an Arctic nation.

As the larger powers' global rivalry has increased, there are both opportunities and dangers for Greenland in the new strategic environment. The United States, for example, has been deeply concerned about potential Chinese influence in the North American Arctic territory, especially interest China has expressed in Greenland's minerals and in helping Greenland construct new airports. The Pentagon reportedly leaned heavily on the Danish government to help fund two of the airports as well as promised some assistance itself.[2]

In this case, the Sino-American rivalry provided an indirect but powerful source of leverage for Nuuk vis-à-vis Copenhagen. U.S. Secretary of State Mike Pompeo also visited Nuuk in May 2019 and announced the U.S. intention to open a consular office, and, as indicated below, a bilateral MoU on minerals was signed a month later. Greenlanders will probably welcome diplomatic attention as well as increased cooperation in areas such as the economy, tourism, education, and enhanced relations with Indigenous communities in North America. However, there is a strong predisposition to avoid geostrategic entanglement or to limit international contacts to only certain countries.

Conclusions

Greenland is assuming a more pronounced place in the global consciousness. This involves a number of projections, particularly around indigeneity, sovereignty, the nature and shape of independence, ideas about what constitutes resources, and the meanings and nature of place, as well as

challenging ideas of sustainability. In the case of extractive industries, for example, a broad range of social, discursive, economic, and political practices and procedures are at play (both within Greenland and internationally) through which Greenland's environment and resources are probed, mapped, defined, classified, and audited, and given different meanings. Greenland's resource spaces have become highly contested social, political and ideological sites entangled with wider global processes (e.g. Nuttall 2017).

As discussed in this chapter, mining is considered integral to Greenland's future economic prosperity. Foreign investment—including possible Chinese funding—is vital to further development in the island's resource and infrastructural capabilities. China has defined itself as a "near-Arctic" country and sees a "Polar Silk Road" as key to its Belt and Road initiative. In 2016, Denmark declined an offer by a Chinese mining company to buy an abandoned base in Greenland, citing security reasons. As a matter of national security, the Danish government handled the matter rather than the Government of Greenland, and took the decision largely to avoid alienating American political opinion that would have been reluctant to see the Chinese "foothold" grow in Greenland (recent discussions over possible Chinese investment in the expansion projects for Greenland's airports have also been controversial).[3] In the meantime, U.S. interest in Greenland has extended recently with the signing of an MoU in June 2019 that sets out a framework for cooperation on mineral sector governance and technical engagement between Greenland's Ministry of Mineral Resources and the U.S. Department of State. Among other things, the MoU allowed for the joint Greenlandic-U.S. funding of an aerial hyperspectral survey over South Greenland in summer 2019.

In October 2019, an American delegation, which included members of the National Security Council and the Pentagon, visited Nuuk to discuss future United States-Greenland relations; and at the end of that month, Air Greenland announced it was close to finalising an arrangement with Icelandair that would allow people to book a codeshare flight on Air Greenland's website from Nuuk to New York and other U.S. cities via Keflavik.

We can think of Greenland as a geo-assemblage (Dodds and Nuttall 2019); it is a vast archipelago where topological and topographical relationships and networks play their part in assembling, animating and mobilizing discussions and narratives about Arctic sustainability, geopolitics, and environmental futures, not just within the political-territorial unit of

Greenland, but also in the Kingdom of Denmark as well as the Arctic as a whole. Component parts of a geo-assemblage, however, are all engaged in, entangled with, and are affected by, a complexity of regional and global processes that act to stabilize or destabilize them. Contemporary Greenland is a site of large assemblages of many forms of activity concerned with the country's future that constitute an intense and intersecting global scientific, commercial and geopolitical gaze. International scientific research and monitoring facilities are maintained at enormous cost on the inland ice and numerous teams of scientists from around the world are flown into remote fjords to focus on the effects of climate change on the cryosphere, coastal waters, and wildlife; mining companies and seismic survey vessels move personnel and equipment in and through remote locations and across waters which are difficult and expensive to reach and work in; tourists and cruise ships have precipitated a form of mass tourism in some places, such as Ilulissat in Disko Bay (itself a destination for "last-chance tourism" given its location near Sermeq Kujalleq, the world's fastest moving glacier and symbol of climate tipping points), with associated problems that apply pressure on local settings; business interests are focused on possibilities for the development of Greenland's economy and are scoping out the potential of global markets for products ranging from fish, fresh water, glacial ice, glacial rock flour, and sand; urban planners and architects are visualizing sustainable forms of living in Greenland, as new buildings and designs for the country's growing towns seek to erase colonial-era legacies of spatial practice and housing conditions; and Greenland's strategic importance has not diminished even if strategies of sovereignty and security are perhaps framed more in environmental, social and economic constructs rather than in conflictual terms or as matters of strategic dispute.

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Notes

1. The Kingdom of Denmark (*Kongeriget Danmark*, in Danish) is a constitutional monarchy comprising the country of Denmark and two autonomous Danish North Atlantic territories, the Faroe Islands and Greenland. Since Greenland is geographically part of the North American continent, the Kingdom of Denmark is unique as a sovereign unitary state in the context of its membership of the Arctic Council in that it encompasses territory in both Europe and North America. The Danish Realm (*Rigsfælleskabet*) is the name often used to refer to the relations among the three constituent parts of the kingdom.
2. https://www.wsj.com/articles/how-the-pentagon-countered-chinas-designs-on-greenland-11549812296
3. "Denmark spurned Chinese offer over Greenland base for security concerns." 6 April 2017. https://www.reuters.com/article/us-denmark-china-greenland-base-idUSKBN1782EE

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Evolving Self-governance, the Rights of the Child, and the Future of Greenland

Sara Olsvig

I appreciate the opportunity to participate, if only virtually, in this year's North Pacific Arctic Conference, which I have had the pleasure of attending in person on a previous occasion. At that time, there was no specific session on Greenland, so I am also pleased to see the attention that you are giving to our country on this occasion. I have read the excellent papers by my colleagues on this panel, and want to provide some supplementary points in two quite different areas as Greenland increasingly moves from self-governance toward independence. The first is to illustrate that many gray zones in the current Greenlandic-Danish agreement have emerged as specific issues come up. The second concerns children and Indigenous rights and the major social challenges we face on our path to the future. The first is informed by my earlier experience as a politician and Member of Parliament, although I am approaching the subject from an analytical and not a political perspective. The second is informed by many recent reports and my current position heading the UNICEF office in Greenland. It may seem from the outside that self-government is a very clear, tidy status that constitutes a stepping-stone between our previous home rule status and our future as an independent Greenland. But in fact, over the course of the past decade, we have learned that within the self-government phase itself, there is the on-going task of sorting out an evolving relationship between two nations bound together within the Kingdom of Denmark. This relationship is not only about Greenland and Denmark, but may involve other actors because of Greenland's increasingly strategic position in a globalizing world.

Let me refer to three specific cases to illustrate these gray zones: first our law on large-scale projects, which passed the Parliament in 2012; second, the repeal of the zero-tolerance ceiling on the mining of uranium and other radioactive materials in 2013, and finally the current, on-going controversy over international airports.

In the first case, we thought the Self-Government Act[1] was quite clear to both Greenlanders and Danes that Greenland had the authority to legislate the large-scale projects act. But when it came to some of the specific

provisions, Denmark became unsure, and at one point the then-Danish Prime Minister called for a "time out" so that he could ascertain that the Greenland Act was compatible with Danish law. In this case, Greenland sought to clarify and widen its areas of autonomy, but this happened largely through a stumbling process where issues were discovered that had not been anticipated by the self-government act and the negotiations leading up to its passage into law.

In the case of lifting the zero-tolerance provision for uranium mining, intended to stimulate mining, my party and I were opposed to this. It narrowly passed, but what happened afterwards is very interesting from an analytical perspective. We now know that both Greenland and Denmark had to go deeper into the issues and structures involving dual-use materials, those that are not just commercial but of strategic and military significance. Because of this dual-use status of a wide range of mineral resources, the legislation has gone from a matter that was considered once completely within Greenland's hands to one that is partially back in Denmark's, since it has responsibility for Greenland's defense and security.

Similarly, in the case of the new airport structure, one would assume the kind of infrastructure we build in Greenland should be entirely a domestic matter. But it became very quickly recognized that this domestic matter had international defense and security implications, and thus was of importance to outsiders. In this case, we learned through social media that the U.S. Department of Defense had a great interest in these airports. The U.S. issued a Letter of Intent stating their interest in investing in the airports, using wording such "enhancing U.S. and NATO capabilities in the North Atlantic"[2]—and thus the issue was transformed into one that involved both Washington and Copenhagen. This is because Greenland did not have its own funds and was required to seek loans to build the airports. China was one potential source. Ultimately, because of the defense and security implications, Denmark decided to offer funding to ensure that construction was handled within the Kingdom of Denmark, comprising Denmark, the Faroes, and Greenland. One might say this was a matter of Denmark protecting its own area of sovereignty.

Clearly, Self-Governing status has implications and consequences that will continue to be worked out and evolve as long as we have this status. It is incumbent on us in Greenland, both in parliament and also among the public, to pay more attention to these details. Currently, we often feel that we are not always aware of the full implications, but this is not just

a matter of transparency. Our own lack of the requisite human resources often constrains our capacity to study and understand the implications of these decisions in a rapidly changing world. One could argue that the Greenland parliament itself needs to add analytical capacity in these areas. With the most recent development—an increased U.S. interest in Greenland—one could also argue that a broad public debate on whether Greenland wants to be a part of a further militarized Arctic or not is of fundamental importance. As history has shown, military interests have had severe human consequences for Greenlanders, such as the forced relocation of the Inughuit population in Uummannaq, where the U.S. Thule Air Base was established in 1951.[3]

This leads me to my second main point, which concerns domestic capacity building. We are on a pathway toward independence, which is to say that we are on a road to a new future towards becoming a sovereign nation that needs to be strong to be a successful international entity. If we don't have a strong society, we can end up in a situation where we appear to be more independent, but in fact have less self-determination. I'll return to this point later.

Like many mostly Indigenous nations, we face many challenges in the areas of children's rights and living conditions, social affairs, education, and health. There are several recent reports relevant here. Greenland was last reviewed in 2017 by the United Nations Child's Rights Committee as part of a periodic process required by our signature and ratification of the 1989 Convention on the Rights of the Child.[4] Denmark, the Faroes, and Greenland all go through the U.N. review process, and the United Nations made a long list of recommendations for Greenland. These included strengthening national statistics by collecting systematic data so that we have a more precise understanding of our situation as well as a way to measure outcomes, better addressing issues of poverty and hunger, combating violence toward children, including sexual abuse, and improving conditions for children with disabilities. These are only a few of the UN recommendations.

At the same time, a 2017 report showed that social workers in Greenland had a total of 4634 cases involving children and youth. Keep in mind that we have just under 15,000 children in Greenland. The average caseworker handled 84 cases, but it is easy to imagine that some of them had up to 200, while others were below the average.[5]

In 2018, the Greenland government published a report on poverty.[6]

This showed that we do have significant inequities, even keeping in mind that part of the population engages in hunting and the food from hunting does not show up in the statistics. The report also illustrated that poverty has to be addressed in a systemic way. This should be considered in the context of an earlier 2016 report that showed that if Greenland were to fully implement children's rights and support comparable to Finnmark in Norway, it would cost us between DKK 150 to 500 million (USD 22 million to 73.5 million).[7] It also showed that infant mortality is four or five times higher than in Denmark. The study pointed to a critical challenge: the difficulty of recruiting and maintaining social caseworkers in Greenland.

This year the Danish Institute of Human Rights and the Greenland Human Rights Council published a status report, which also illustrated how much more work we have to do on these issues.[8] This report placed emphasis on improving the collection of statistics, better implementation of laws protecting children from sexual abuse and violence, better implementation of laws protecting young people living outside the home, and greater attention to young people at odds with the law.

It is clear that we in Greenland have lots of challenges ahead in building a strong social society and ensuring happier and healthier children. Our situation is not that different from that of other nations with majority Indigenous populations. We do have a strong political will for developing children's rights policies and laws in Greenland. In fact, on issues of social development, such as children's rights, education, and health—in contrast to natural resource exploitation—there is a basic consensus across the landscape of our political parties. But full and effective implementation lags behind. Underlying these lags are questions about the allocation of funds. These are quite limited, and there are obvious trade-offs; more for airports can be less for health, for example.

Education is closely related. One of the problems with ensuring children's rights in Greenland is the lack of education and more generally, the lack of awareness of internationally recognized human rights. We need to build understanding not just of the rights themselves, but the values of tolerance and respect. Without broad societal appreciation of these values, effective implementation of existing laws will be incomplete.

The UNICEF office in Greenland is spearheading efforts to strengthen the rights and conditions for children. Aside from our domestic efforts, we are reaching out to other UNICEF offices, especially those located in countries where other Indigenous Peoples live, in order to promote

cooperation in areas of children's and Indigenous Peoples' rights. In this area, I believe that Greenland cannot only learn from other nations' experience, but that we also have much to share from our experience.

I should also mention that our state- and nation-building efforts are also centered on health issues. Here again, we have to improve our data collection and analysis as a basis for constructing solid policies addressed to our specific conditions. We also need to improve health education at all levels of our society.

Now let's put natural and human resource development together and connect them with the question of independence and self-determination. If we go back to the Self-Government Act, a basic problem is that additional funding needed to move forward an increasingly become more independent of the yearly Danish block grant to Greenland depended very much on mineral resources. But with recent global commodity prices, this "gold mine" is simply not producing, and certainly not at the pace anticipated. These are many other problems besides the interface of Danish and Greenlandic jurisdictions or prices and remoteness. There are also environmental factors and, in many cases, the need to import large numbers of outside workers. (As an aside, immigration exceptions would need approval from both administrations, another example of how these areas of jurisdiction overlap one another.)

We do not have any large-scale projects yet, just small-scale projects. Therefore, economic sustainability may depend on a different concept of development—with more attention to viable small-scale activities, renewable energy, eco-tourism, and developing more healthy food products, since fisheries still provide 90 percent of our export earnings.

The fundamental underlying question is how independent we can be, as some paths to "independence" may lead in fact to less real independence and self-determination. There may be a tipping point, and we need to understand where that is, and then build self-determination from within. That is where concentrating on a diversified economy, children, social values, and inclusion all come into play.

What would be the value of independence if there were fewer Greenlanders to be independent? Our population has leveled off. We are in contact with our counterparts in Denmark, who work not only with Danes but also immigrant Greenlanders. What they report is that immigrants are younger and younger, and they often arrive on one-way tickets without adequate preparation for the society they are entering. As one result, there

are increasing cases of alcoholism and drug use among young Greenlanders in Denmark.

To keep our children at home, we must build a society that is attractive to our young citizens, and that makes them feel that their lives in Greenland are valuable. This is why the basic challenges to building a healthy society in Greenland involve promoting tolerance and social values, concentrating on healthy families and children, promoting education and human rights awareness, and strengthening our economy on a sustainable basis are of utmost importance.

Notes

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An International Relations Perspective

Minori Takahashi

Initially my task was to approach Mark Nuttall's paper, "The Future of Greenland," from the perspective of the five framing questions of Session 2 and make relevant comments from the viewpoint of my field, international relations. However, while preparing this manuscript, I ran into a major obstacle in relation to some of the assumptions inherent in the session theme. In this paper, rather than directly commenting on Nuttall's paper, I would like to contribute by focusing on this obstacle.

What is the obstacle? It is the fact that the field of international relations does not holistically address the natural environment and changes occurring in it. Those issues form the basis of NPAC 2019 deliberations and function as the core variables in the "The Future of Greenland" paper and the session's framing questions. As exemplified by Thomas Hobbes and John Locke, the basic thinking underlying the study of international relations provides no logical circuit in which nature and the environment can be thought of as self-sufficient or sustainable. Instead, the natural environment is separated from its relationship with humans and objectified. That is, the assumption has been that the natural environment is independent and remains in its primitive state unless changed by human hand. Thus, the field of international relations has not been able to digest nature and the environment as issues belonging to it and has isolated them as mere passive objects.

Until now, the international relations field has treated nature, meaning everything living or non-living apart from man, as an independent variable, and has either been disinterested in or tended to push to the side the plurality of the definitions of nature, the diverse relationships between nature and man, and consideration of how these have been dealt with in decision-making venues outside the international relations mainstream. Sometimes the study of international relations passes over these issues as if totally unaware of their presence. As Masatake Shinohara rightly pointed out while citing Dipesh Chakrabarty's paper, "The Climate of History: Four Theses" (2009), our mindsets have been shaped by habitual thinking and sentiment in which the domain of human life formed by economic and cultural modernization is imagined as self-sufficient and independent from

nature (Shinohara 2018, 218-219). And we have for a long time engaged in inquiry with a frame of mind in which that domain is preserved without disturbance.

Now, however, we are observing concepts such as the Anthropocene (which has been defined as the current geological epoch, during which human activity has become the dominant influence on climate and the global environment) take hold. When discussing planetary boundaries and planet politics, we are increasingly aware that human activities strongly influence the planet itself, and that the previous mode of thinking separating "humans" and "nature" can no longer be maintained. That is because, "before we knew it," our impact on nature and the planet has become so huge that indispensable and once-immutable nature is being affected (Shinohara 2018, 245). The field of international relations cannot remain unaware of such a material turn that has taken place in the real world. If, hypothetically, international relations remained disinterested in these swiftly changing dynamics between humans and the natural world, that would have negative consequences for the field's credibility as a scholarly discipline (Maeda 2018).

But what is the "nature" that is so relevant to international relations? It is said that the English word "nature" is synonymous with the Inuit expressions *nuna* or *pinngortitaq* (https://glosbe.com/). Its meaning is as follows: "the natural world; consisting of all things unaffected by or predating human technology, production and design, e.g. the natural environment, virgin ground, unmodified species, laws of nature." This understanding that nature is "the natural world consisting of all things unaffected by or predating human technology, production and design" has, it seems, a certain affinity with the worldview which creates a dichotomy between humans and non-human living and non-living things, which has served as a premise in the field of international relations. I think that the specification within the definition, which mentions "the natural environment, virgin ground, unmodified species, laws of nature" as concrete examples of what the natural world is, also shares with the field of international relations the notion of primitive nature, both in substance and scope.

However, Nuttall pointed out that nuna and pinngortitaq do not denote static objects in opposition to humans such as virgin ground or unmodified species, but entities that are created (or come into being) through dynamic processes such as "becoming" or "coming into existence.", i.e., that these

Inuit words possess a nuance of agency, in which nature *together* with humans creates space for coexistence (Nuttall 2009; Nuttall 2013, 292). In other words, we should not view nature as a static background to be separated from humans and objectified as an immutable foundation indispensable for human activities but rather as an entity that has developed and continues to develop through an interaction with humans.

Thus, nuna and pinngortitaq are incompatible with the dualistic understanding in international relations, which separates nature and humans. Moreover, if we base our argument on the experience of Shunwa Honda (Henry Stewart), which stretches over 40 years and that he obtained in Kugaaruk in the far north of Canada (formerly known as Pelly Bay), it would seem that nuna in particular is actually broader in meaning than the English word "nature," since "nuna" denotes cosmos (universe or cosmic order, harmony) and encompasses the land, air, and sea, as well as what the human mind and body ought to be like (Honda 2018). Although here we encounter the problem of the interpretation of words, international relations should not simply follow the trends, but truly be aware of the plurality of worldviews (Omura et al. 2018).

But that is not all. Narrowing the argument to look more closely at Greenland, there is another important point to be noted. Kalland and Sejersen (2005) point out as a feature of Greenlandic society that, in comparison with Inuit societies in Canada and Alaska, it has a utilitarian approach to nature (p.267), where "utilitarianism" refers to the view that the process leading to a desired end should be decided based on the value of the benefits to be derived from that end. Although he does not use the term "utilitarianism," Hayashi's study (2014) comes to a similar conclusion. He suggests that while striving to achieve harmony with nature and the ecosystem, Greenlanders tend to actively indigenize elements that were not previously present in their society even if they are of foreign origin, if they judge that they may, in terms of efficacy, serve to enhance or maximize the already existing outcomes. Hayashi notes that this tendency stands out when Greenlanders are compared to the Indigenous People of Canada's Nunavut Territory.

I used to think that, if the world is seen as a space in which humans and nature coexist and a social balance through a dynamic interaction between humans and nature is aspired to, as in the substratum of Inuit society, that worldview must have been formed in circumstances in which utility does not matter much. This is because thinking according to which a utilitarian

perception can function in the space dynamically created by humans and nature was, for me, not logical. However, studies by Kalland and Sejersen and by Hayashi eliminate such compartmentalization based solely on deductive reasoning, by providing explanatory variables that deepen our understanding of Greenland's Inuit society. I have already mentioned that nuna means cosmos (or cosmic order, harmony). If so, then we should not categorize nuna/pinngortit as a system, doctrine or principle that is derived in the manner of scientific reductionism, but as a notion that refers to a dynamic process and is derived holistically and intuitively.

The coexistence space referred to as nuna/pinngortit has a fluid character because it changes as nature and man dynamically engage with each other. In such a fluid space the diversity of basic human attitudes towards things is fostered. Thus, to put it concretely, thoroughly conserving nature and actively developing fossil fuels do not contradict each other on the Greenlandic ideational level. Of course, the precondition is that local residents, who are the bearers of development, make judgments regarding how to devise harmony with the ecosystem and at the same time increase utility. But I think that an orientation towards a greater positive sum, in which there is no trade-off between the conservation of nature and resource development, is at the core of the coexistence space referred to as nuna/pinngortit. This perspective may, for example, be useful when thinking about recent movements in resource development in Greenland that are emphasized in Nuttall's paper. The first framing question too, which asks *what forces are driving political and economic developments in Greenland*, can also perhaps be placed and addressed in this context.

What is at least required of us in this Anthropocene age is not to mentally process things within our existing mindsets, but to understand that, while there is no world consisting only of humans, there is also no pure nature as a closed sacred realm. We should not process man and nature as separate individual variables but as elements that influence each other. And, conducting such a thought experiment, I think, makes sense in that it relativizes the main theme, exactly because our session has a focus on a concrete, individual area: Greenland.

Finally, let me also comment about the international situation surrounding Greenland in recent years, while focusing on its structure and drawing on the framing question 3: *What outside actors are interested in Greenland's resources and have the capacity to make major investments in their development? What debates are occurring within Greenland regarding*

the prospect of foreign direct investment?

Needless to say, in recent years China has become an independent variable of crucial importance for understanding international relations in Greenland. For example, direct investment by Chinese companies has come to account for more than 10 percent of Greenland's GDP (Rosen, M.E. et al. 2017, 54) and, in conjunction with the fact that the scale of Greenland's economy is small, its significance is gradually growing. Moreover, the scope of China's interest in Greenland has been broad and has encompassed a wide range of activities, including the construction of airports and research stations, the establishment of cultural facilities, and the creation of the infrastructure for the exploitation or uranium and rare earth elements. On the other hand, the size and nature of Chinese investments and the fear that Greenland could fall into a debt trap has raised alarms not only in Denmark but also in the United States, which sees Greenland's value in terms of its national security. For the United States, possible Chinese investments in airport infrastructure were an especially worrisome proposition. This was especially true since one of the investments, subsequently disallowed, was to acquire a former U.S. military airfield.

From Greenland's point of view, the new dynamic (open) trilateral relationship that includes China strengthens its leverage vis-à-vis Denmark as compared to the formerly static (closed) bilateral and semi-internal relationship with mainland Denmark. As elaborated in Takahashi (2019), fluctuations in the power relations between actors are more fluid in trilateral than in bilateral relationships. Here, the important question is the quality and durability of Greenland's relationship with China (and other external entities). If a direct, sustained communication exists between the two, and if it lasts over time, the probability is that Greenland's leverage on Denmark, which then finds itself between Greenland and China, will be more effective. As the concept paper for the North Pacific Arctic dialogue shows, interactions between the global and the local can change the quality of relations among different actors, including states. This is an important structural factor to be considered when analyzing the future of Greenland.

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The Path Toward Independence

Birger Poppel

> *Recognizing that the people of Greenland is a people pursuant to international law with the right of self-determination, the Act is based on a wish to foster equality and mutual respect in the partnership between Denmark and Greenland. Accordingly, the Act is based on an agreement between Naalakkersuisut [Greenland Government] and the Danish Government as equal partners.*
> *(Act on Greenland Self-Government. Act no. 473 of 12 June 2009)*

The preamble from the Act on Greenland Self-Government, quoted above, concluded one discourse about the people of Greenland/the Greenlanders'/the Greenland Inuit's status according to international law. It also opened a different discourse about the next step on the long road from colonialism (1721) via formal decolonization (1953) to Home Rule (1979) and Self-Government (2009). In the section entitled "Greenland's access to independence" (ibid. §21), the steps for Greenland's independence are set out: negotiations between the Danish and the Greenland governments resulting in an agreement endorsed by a referendum in Greenland and concluded by the consent of the two parliaments.

Following the introduction of Home Rule, a large number of fields of responsibility had been transferred to the Greenland Home Rule authorities (e.g. social affairs, education, health care, infrastructure, housing, fisheries, retail and distribution of goods) and funded by a Danish block grant. Self-Governance made possible the transfer of more than 30 additional fields of responsibility to be eventually financed by Greenland's authorities upon transfer. Only two of these—mineral resources and working conditions at sea—have so far been transferred. The following fields of responsibility cannot be transferred to the Greenland authorities until Greenland becomes an independent state: the constitution; foreign affairs (with the modifications and exceptions mentioned in the Legal Act no. 473, chapter 4); defense policy and national security; the High Court of Justice; citizenship; and monetary and exchange rate policy (Act on Greenland Self-Government, Act no. 473).

Tasks, Challenges, and Obstacles

The last part of the paragraph on "Greenland's access to independence" briefly states:

> *"Independence for Greenland shall imply that Greenland assumes sovereignty over the Greenland territory."*

Whereas this leaves no doubt about the sovereignty question for an independent Greenland, it certainly raises a number of crucial considerations, since nobody expects Greenland to safeguard its sovereignty with its own armed forces. Iceland, a neighbouring country with a much smaller territory but a population roughly five times Greenland's, has no armed forces and its sovereignty is safeguarded by its membership in NATO.

However, an independent Greenland would not exist in a "security vacuum," as Greenland is geographically part of North America. Since 1823, the United States has continued to apply the Monroe doctrine, ensuring that Greenland is within the U.S. overall defense strategy. As stated in a Newsletter from the Danish Institute for International Studies, DIIS (November 2018):[1]

> *Generally, however, given Denmark's close alignment with American strategic interests, geopolitical tensions over Greenland remain at a low intensity. That could change were Greenland to obtain full independence from Denmark and therefore the freedom to negotiate foreign policy and security matters with whomever it chooses.*
> *http://pure.diis.dk/ws/files/2515096/chinese_investments_in_greenland_WEB_1.pdf*

This was highlighted recently when U.S. President Donald Trump suggested the U.S. offer to buy Greenland. Although Greenland Premier Kim Kielsen's prompt answer that, "Greenland is not for sale" was backed up by the Danish Premier Mette Frederiksen—who further stated that the idea was "absurd"—the American interest was clear. The proposition followed several U.S. initiatives, including visits to Greenland by the U.S. Ambassador Carla Sands, to establish connections and gather information about mineral development and other Greenlandic activities and to prepare for permanent U.S. representation in Nuuk. (https://sermitsiaq.ag/node/215539).

Safeguarding sovereignty is an important but not the only challenge on

Greenland's road to independence. Greenland's economic development and the degree it can achieve the diverse and robust self-sufficiency needed for independence are based not only on fisheries but also mineral exploitation and tourism. These are prominent in the independence discourse in Greenland and Denmark. As economic relations between the two have been central in both the joint Home Rule and Self-Government commissions, and since Danish governments since the 1970s have consistently asserted that an independent Greenland would no longer get economic support from Denmark, it is worth analyzing these aspects, including Greenland's continued financial dependence on Denmark:

- The basic economic principle in the Home Rule Act (1979-2009) was that a block grant[2] equal to the then-total expenditure of the Danish state in a given field of responsibility was transferred annually to the Greenland government when the responsibility was transferred. In 2017 the annual block grant (sum of totals for each responsibility) was 3.8 DKK billion (roughly € 500 million/USD 570 million).
- Part of the compromise leading to the Self-Government Act included a significant change in bilateral economic relations. According to the new economic arrangement, the Danish state would continue to fund the 30+ fields of responsibility still not transferred to Greenland authorities. When responsibility for these "new" fields is transferred to Greenland authorities, the Greenland government will also have to cover the expenses for operating these fields. As stated above, Greenland assumed responsibility for two areas in 2010, but since then has asked for no new fields of responsibility.
- Denmark still finances more than 30 fields of responsibility that could be transferred to Greenland authorities under the Self-Government Act. Denmark further finances some tasks that Greenland can only assume responsibility for as an independent country (such as defense and foreign policy). As such, the Danish state finances operational and investment expenditures of 1,2 DKK billion (€ 160 million/USD 180 million). Denmark's expenses for Greenland totalled 5 DKK billion (€ 660 million/USD 750 million) in 2017.
- Since Home Rule in 1979, the Danish state's expenses have declined from roughly two thirds to one third of Greenland's GDP (see Figure II.1).
- The Danish block grant currently accounted for about half of public spending in Greenland, roughly 10 DKK billion (€ 1,320 million/USD

1,500 million) in 2017.

- Denmark has both interests in and benefits from its relations with Greenland. If Greenland were not part of the Danish Realm, Denmark would not be an Arctic state or a member of the Arctic Council. Denmark's value to NATO could also be reduced.

When Greenland became a part of the Danish Kingdom in 1953 it was formally no longer a colony and was thus removed from the United Nations list of "Non-Self-Governing Territories" in 1954. Since there was no prior process on consultation, the Greenland Council had just few days in 1952 to consider the suggested change to the Danish Constitution that would be required. Kleist concludes (Kleist 2019, 94) the process was not an informed democratic process, since the Greenland Council did not receive basic information about the three options for self-determination being discussed at that time in the work of the UN Decolonizing Trust. These options included integration into the colonial power, becoming a partner in a "free association," or full independence.

These options were discussed years later in the Greenland-Danish Self-Government Commission[3], and are mentioned as options for an independent Greenland in the official comments to the Act on Self-Government.[4] They are thus both relevant and interesting to address in considering an independent Greenland.

Some challenges to being fully independent are briefly introduced above, without discussing what it requires at a more general level to be an independent microstate in a globalising world.

A "Free Association" is an arrangement where two states—each having its own constitution—collaborate. Free Associations were among the options for self-determination that were discussed in the UN and is a UN-accepted arrangement involving one party as the former colonial power and the other as the former colony. Free Associations[5] can include agreements about defense and continuing economic support, including block grants (Kleist 2019).

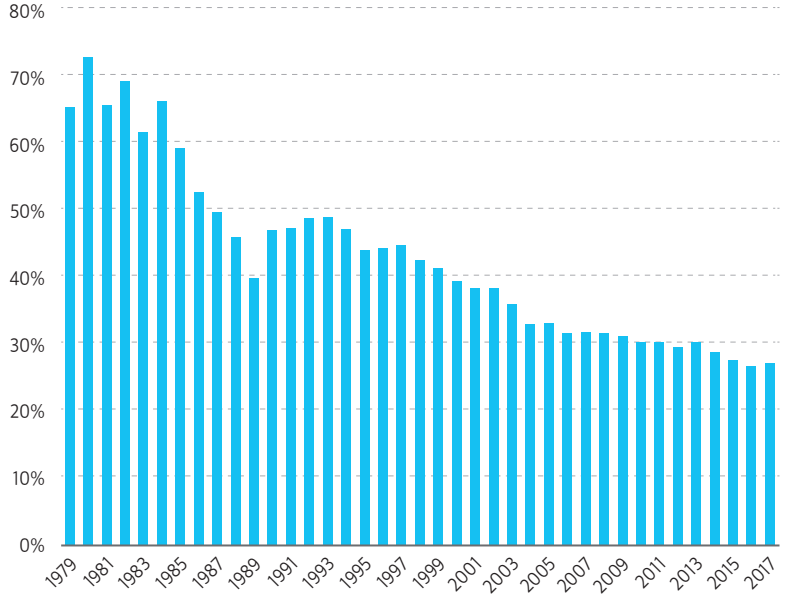
As a Free Association may provide for both sovereignty and economic sustainability, it is worth taking into consideration, not least because the Greenland Parliament recently formed a Commission to draft a Constitution by June 2021 for an independent Greenland. Part of its mandate is to consider a "Free Association" arrangement.

Challenges for an Environmentally, Socio-economically, and Culturally Sustainable Independent Greenland

There are many issues that require debate, policies, and implementation to pave the way towards an independent and sustainably developing Greenland. Covering economic, environmental, social and cultural sustainability goes beyond the scope of this commentary, but a few economic aspects will be addressed.

Economic growth in Greenland in recent years has been fairly high, primarily because of increasing prices for fish products (Greenland Halibut) and prawns—together comprising about 90 percent of Greenland's exports. Despite expectations that mineral resource development and offshore oil and gas[6] might offer a shortcut to economic self-reliance, Greenland still depends on Danish block grants and other transfers to maintain living and public service standards.

Despite the decline in the Danish state transfers' share of the Greenland



Source: Statistics Denmark & Statistics Greenland: Statistical Yearbooks and Databank (StatBank)

Figure II.1 Danish state transfers' share of Greenland's GDP (1979-2017)

GDP (see Figure II.1), this share still provides roughly half of Greenland's public spending, and self-reliance is not just around the corner.

At a conference in Nuuk[7] in May 2019, the chairman of The Greenland Economic Council, Professor Torben M. Andersen, stated that a crude way to "compensate" for Danish state transfers would be to halve Greenland public spending or double taxes. Andersen added that reducing public spending[8] would seriously affect health care, education, the social safety net, and reduce living standards. Increased taxes potentially would also accelerate net outmigration, already a problem for Greenland.

As Andersen concluded, the obviously more feasible way toward self-reliance is to develop economic activities to generate income and taxes.

Discussions in Greenland about economic strategies and developing economic activities typically focus on "three pillars": fishing, especially large-scale fishing, which is still extremely important to the Greenland economy; tourism; and mineral exploitation and extraction. In this note, we cannot do full justice to these pillars.

Renewable Resources

Traditional hunting is under pressure—not least because of the negative impacts that climate change and global warming have had on hunting and fishing from the sea ice in Northern Greenland. Small-scale fishing (particularly for halibut), on the contrary, has been thriving in and north of the Disco Bay area. Furthermore, large-scale fishing with trawlers (floating factories) for shrimp and Greenland Halibut are increasingly important to the Greenland economy.

The flip side of the current abundance of renewable marine resources is a dependency on a few species. This risks depletion of the stocks due to overfishing or migration and price variability in the world markets. The risk of over-fishing is not a fantasy. A recent example of the conflict between current incomes and sustainable resource use is that larger quotas than recommended by the Greenland Institute of Natural Resources for Greenland Halibut have been granted fishermen in the Disco Bay area. The main political argument for this quota is that, "Naalakkersuisut has estimated that an increased quota was necessary to secure the employment the rest of the year for the fishermen with small boats and the workers in the factories." (Greenland Minister of Fisheries, September 24, 2019—

author's translation.)[9]

Greenland's fisheries compete in world markets and must take account of increasing consumer awareness of sustainable fisheries. Greenland has gained Marine Stewardship Council (MSC) certification for operating sustainable and well-managed fisheries[10].

Tourism

The debates here include whether Greenland should focus on mass tourism or try to practice eco-tourism targeting specific and/or wealthier groups. Discussions include deciding where tourism should be encouraged, keeping in mind Greenland's vulnerable and slowly regenerating environment. This means that regulations and control are of outmost importance. But how does a small population regulate and control the world's largest island and ensure a sustainable tourism industry, when large cruise ships often carry several thousand passengers along the Greenland coast and EEZ (Exclusive Economic Zone)? This can only happen in an environment of effective international cooperation with other governments and the cruise line industry.

Non-renewable Resources: (Minerals including Oil and Gas)

Several points are worth briefly noting:

- Greenland has abundant mineral resources, and many are estimated to be available in economically feasible amounts. These are all publicly owned.
- Exploration and exploitation of minerals are often challenging and costly because of remoteness, harsh weather conditions, and lack of infrastructure.
- International interest from mineral companies is highly dependent on world demand and prices.
- There is vigorous ongoing debate in Greenland about balancing environmental concerns with hopes for future substantial incomes from mineral exploitation. Political parties, for example, take differing positions on the licensing conditions and environmental, safety, financial, and other regulations including taxes and royalties[11].

- Because the Paris Climate Accords do not ensure "equal access to the right to development, also for the peoples of the Arctic" (Governments of Nunavut and Greenland, and Inuit Circumpolar Council, Dec. 8, 2015),[12] the Government of Greenland did not sign the Paris Accords. The argument refers to §31 in the United Nations Declaration of Indigenous Peoples Rights that defines Indigenous Peoples right to use "their lands or territories and other resources"[13] and also to the fact that Indigenous Peoples are not responsible for global warming. It could be argued on this basis that Greenland should be compensated for abstaining from allowing oil and natural gas extraction and non-environmentally friendly mineral development.
- Tests of glacier-flour indicate there is rich mineral content, particularly potassium, which might increase fertility in poor tropical soils. (Sermitsiaq, September 21, 2019).
- Very recent studies of sediments from Greenland's ice sheet show that Greenland sand might potentially help meet increasing global demand for sand. (New York Times, July 1, 2019).

Summary

The foundation for Greenland's formal independence is set out in the Legal Act on Greenland Self-Government: negotiations and agreements between the Danish and Greenland governments that must be endorsed by a referendum in Greenland and approved by the two parliaments. It further states that, "*Independence for Greenland shall imply that Greenland assumes sovereignty over the Greenland territory*."

Based on the three options presented in the UN Decolonizing Trust, a "Free Association" was discussed. Such an arrangement between Denmark with Greenland can include agreements about defense and economic support (including block grants).

The "three pillars" in Greenland's economic development—fisheries as well as tourism and mineral exploitation—all pose challenges for Greenland if the principles of sustainable development are going to be fully applied. MSC certification in West Greenland cold water prawn fishery and Greenland Halibut fishery are examples of successful achievements. But for all three pillars, the connections to and dependency on international demand trends and world market prices are evident, ensuring Greenland's

place in an ever more globalized world. Furthermore, Greenland has—in a geopolitical sense—moved to the center of the Arctic region because both climate change and the geopolitics of the island command increased interest from Arctic and non-Arctic states. This raises a fundamental question: "What does independence and sovereignty mean for a sustainable Greenland?" Must this aspiration be at the expense of sustainability, and, if so, will Greenland really be independent and sovereign in the truest sense of these terms?

Notes

1. The discussion about China's Arctic strategy and interests in Greenland and other parts of the Arctic is on-going and has most recently hit the headlines in relation to the pre-qualification of CCCC (China Communication Construction Company) for airport construction.
2. It is important to note that despite the fact that the block grant was—and is—negotiated in the joint Home Rule Commission and agreed upon between the two countries' negotiators, many Greenlanders regard the block grant a gift, implying an obligation towards Denmark and an inferior status on Greenland as the recipient.
3. Grønlandsk-dansk Selvstyrekommissions betænkning om selvstyre i Grønland (Greenland-Danish Commission on Self-Governance), 2008: 30-31.
4. Lovbemærkninger til Lov om Grønlandsk Selvstyre (Legal comments to the Act of Self-Governance (2009: chapter 10.1).
5. The U.S. has such arrangements with Palau, the Federated States of Micronesia, and the Republic of the Marshall Islands. These are independent countries with their own foreign ministries, but under the periodically renegotiated "compacts of free association," the U.S. is responsible for defense, allows free immigration, and provides the equivalent of block grant support for governmental functions. The Cook Island Free Association Arrangement with New Zealand from 1965 is another example of "Free Associations." (Kleist 2019).
6. See e.g. B. Poppel, "Arctic Oil and Gas Development: The Case of Greenland." In: Heininen, L. and H. Exner-Pirot, eds. *Arctic Yearbook 2018* (Akureyri, Iceland: Northern Research Forum, 2018), 328-360. Available from https://arcticyearbook.com/images/yearbook/2018/Scholarly_Papers/19_AY2018_Poppel.pdf

7. Future Greenland Conference 2019, Nuuk, Greenland May 14-15. https://knr.gl/da/tv/future-greenland/future-greenland-2019-14-knr-15052019
8. To nuance potential implications of decreased public sector spending it should, however, be mentioned that more tailor-made solutions to administer and govern the Greenland society might also be applied. It is well known, that the Danish state introduced Danish administrative practices in Greenland before the introduction of Home Rule. It is, however, also a fact that most of these practices were still in effect after 1979 and, furthermore, Greenland still tends to copy or mimic expensive Danish administrative practices.
9. Answer by Naalakkersuisoq (Minister) for Fisheries to a so-called §37-question from a member of Inatsisartut (Greenland Parliament): '… *har Naalakkersuisut vurderet, at en forhøjelse af kvoten var nødvendig for at sikre både jollefiskernes og produktionsarbejderenes beskæftigelse resten af året.*' September 24, 2019. https://www.altinget.dk/misc/307_2019_hellefisk_ved_Diskobugten_SOGEI_svar.pdf
10. See https://fisheries.msc.org/en/fisheries/west-greenland-coldwater-prawn & https://www.msc.org/media-centre/press-releases/world-first-as-greenland-halibut-fishery-gains-msc-certification
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PART III

MARITIME GOVERNANCE IN THE ARCTIC

Perspectives from Non-Arctic States

Sung Jin Kim

The Arctic is changing dramatically. The melting of sea ice driven by climate change has accelerated and it is expected that by 2050, the Arctic Ocean will be ice-free during the summer months. Climate change impacts, such as rapidly warming temperatures and melting sea ice, have had an effect on almost every aspect of the Arctic region. First and foremost, they are having a direct impact on the Arctic environment and its ecosystem. Melting sea ice has caused 30 percent of the fish species, 21 percent of mammal species, and 70 percent of plant species to become endangered, profoundly affecting the Arctic food chain. Furthermore, climate change is transforming the lifestyles of Arctic Indigenous People. There are also concerns over further acceleration of global warming due to the release of methane gas into the atmosphere, and of a possible outbreak of new contagious diseases, due to the exposure to ancient diseases such as anthrax.

On the other hand, climate change impacts in the Arctic Ocean have brought with them opportunities for industrial and economic development. Guggenheim Partners has estimated that an investment of approximately one trillion USD in Arctic infrastructure and resource development will be made between now and 2030. In 2018, the *Venta Maersk* was the first commercial container ship to have successfully navigated through the Arctic, signaling an increase in opportunities for commercial usage of the route. Also, due to climate change, opportunities in cruise tourism are on the rise, as well as cooperation for fishery resource management such as in the Central Arctic Ocean.

Changes in the Arctic driven by climate change and melting sea ice are demanding a governance system that can effectively support these changes with long-term stability in mind. In particular, stable governance systems are being required through the establishment of rules to address issues such as marine micro-plastics, marine paint, the usage and carriage of heavy fuel oil, and marine noise pollution.

The year 2020 marks the 10th anniversary of the North Pacific Arctic Conference (NPAC). Since 2011, NPAC has recommended solutions and proactively discovered agendas important for the sustainable development of the Arctic by observing, predicting, and making recommendations.

Over the next decade, it is expected that NPAC will continue to promote dialogue among scholars on Arctic issues, and generate insight and vision for the region's future.

Recognizing an important contribution NPAC is making for a stable Arctic governance, this paper examines the Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (CAOF Agreement), the roles played by its Asian signatories, and the importance of marine cooperation.

Arctic Governance and the CAOF Agreement

CAOF Agreement from an Arctic governance perspective

On October 3rd 2018, five Arctic coastal states—the United States, Russia, Canada, Denmark, Norway—and five non-Arctic states—Korea, Japan, China, Iceland, and the European Union—gathered in Illulissat, Greenland to sign the CAOF Agreement. This Agreement is meaningful in that these 10 countries agreed to temporarily suspend fishing in the Central Arctic Ocean and that it provided a platform for countries to cooperate on fisheries conservation and management in the Central Arctic Ocean.

Agreeing to the need to take action in response to changes in the map of global fisheries due to a northward migration of fisheries and changes in the conditions for fishing in the Central Arctic Ocean, Arctic and non-Arctic states have sought to negotiate regulations and international accords regarding this matter. As a result, 10 countries have adopted the precautionary principle in the Central Arctic Ocean before any actual fishing has begun in this area, and have put in place cooperative frameworks such as the joint scientific monitoring program for enabling fishery resource surveys.

From an Arctic governance perspective, the CAOF Agreement is significant in three ways:

First, the CAOF Agreement represents a balance of interests among various stakeholders. It is the first Arctic agreement where non-Arctic States participated in its negotiation and adoption.

Second, as previously mentioned, the CAOF Agreement aims to predict and prepare against instabilities and conflicts that could arise from a number of climate change-related impacts, and it seeks to protect and

manage fishery resources in the Central Arctic Ocean through the adoption of the precautionary principle. It is an example of the importance and the role of norms at play within Arctic governance and it is likely to have a significant impact on the formation of future norms as well.

Third, the CAOF Agreement proposes ways to sustainably manage and develop Arctic fisheries and leaves open the possibility of establishing a Regional Fisheries Management Organization (RFMO). This means the Agreement could play an intermediary role in initiating the discussion on the norms related to "the biodiversity conservation for areas beyond national jurisdiction (BBNJ)" in the Arctic, considering fish is included within the criteria of biodiversity in BBNJ.

CAOFA and UNCLOS: Governance in the high seas

Important principles and articles on the high seas specified in UNCLOS, 1995 Fisheries Stock Agreement, and the 1995 FAO Code of Conduct for Responsible Fisheries are also adopted in the CAOF Agreement. This is so stated in the preamble of the Agreement, and Article 14(1) of the Agreement also specifies that the parties must undertake international responsibilities as reflected in UNCLOS and the 1995 Fisheries Stocks Agreement. On the other hand, establishing a RFMO will help manage the fishery resources in the high seas of the Arctic Ocean, thereby complementing the UNCLOS system, as well as acting as an important mechanism for further developing it. Thus, the UNCLOS system and the CAOF Agreement can be seen to be mutually complementing and together strengthening the governance system that regulates the high seas.

The UN treaty system on the ocean, namely the UNCLOS and the

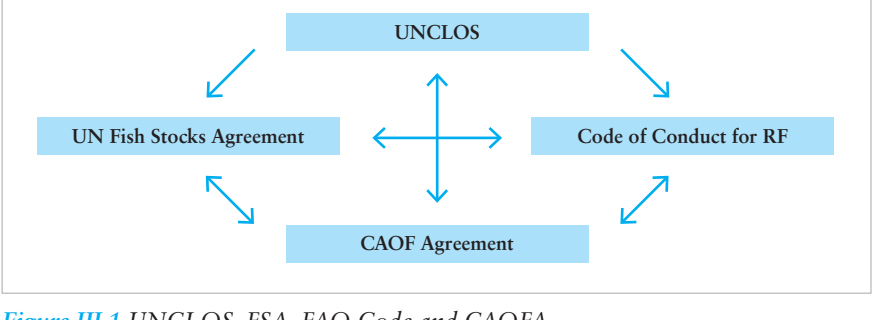

Figure III.1 UNCLOS, FSA, FAO Code and CAOFA

1995 Fisheries Stock Agreement, had a large influence on the development of core contents of the CAOF Agreement. First, the precautionary principle: The CAOF Agreement adopts a temporary precautionary measure to conserve and to make it possible to sustainably use the marine biological resources in the Central Arctic Ocean, and this comes from Article 6 on the precautionary principle of the 1995 Fish Stocks Agreement. Second, it is about pursuing international cooperation through RFMOs. The CAOF Agreement specifies that the parties start negotiations for establishing a RFMO, which is based on UNCLOS Article 118. Third, it is about regulations for dispute settlement. Article 7 of the CAOF Agreement specifies that in case of conflicts arising in relation to the application of the Agreement, those disagreements are solved in accordance to the procedure outlined in the 1995 UN Fisheries Stock Agreement on dispute settlement.

The roles of non-Arctic states (Korea, China and Japan) under the CAOF Agreement

Under customary international law and the United Nation Convention on the Law of the Sea (UNCLOS), all nations have the right to fish in the high seas. The Arctic high seas are no exception. Thus, not only Asian states but also non-Arctic states all have an equal right to commercially fish in the Arctic high seas. The CAOF Agreement is special in that it is the first Arctic-related multilateral agreement that includes countries other than the eight Arctic Council member states. This shows that Arctic issues are becoming more widely seen not as regional but global issues, and that the role of Arctic Council Observer states and non-Arctic states in contributing to addressing Arctic issues is growing.

It is worth noting that Korea, China and Japan, the three Northeast Asian Arctic Council Observer states that participated in the CAOF Agreement, actively participated in the negotiations for an agreement from the beginning, hosting additional expert roundtable sessions that were separate from the official negotiation meetings. By having Korea, China and Japan included in the discussions and negotiations of the CAOF Agreement, a negotiation platform that discourages Arctic coastal states from advancing arguments that only favor the coastal states' rights in the Arctic high seas was created, and also it resulted in creating an exemplary case where Arctic and non-Arctic states cooperated in creating a new legal regime concerning potential commercial fisheries in the Central Arctic Ocean.

Practices of Korea's Fishery Management in Relation to the Arctic Ocean

Korea's deep-sea fishing policy

In response to changing international circumstances surrounding high sea fisheries, Korea has long sought to become a responsible fishing nation by proactively adopting policies such as those on the conservation and management of marine living resources. In January 2019, Korea announced the "Third Comprehensive Development Plan for Deep-Sea Industry (2019-2023)" with a stated policy goal of becoming a sustainable and advanced deep-sea fishing nation. On international cooperation, the policy aims to advance Korea's international stature as a leader on international norms by directing the nation to actively participate in the establishment of international norms such as on the prevention of IUU fishing, and to increase financial and scientific contribution to international fisheries organizations. Also, Korea has actively participated in the activities of international fishery organizations such as the regional fisheries management organizations (RFMOs) with a focus on the Food and Agriculture Organization (FAO).

Korea's contributions in implementing the CAOF Agreement

1) Regional fisheries organization: Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR)

As a nation that conducts deep-sea fishing, Korea has been contributing to the activities of regional fisheries organizations by conducting scientific research and stock assessments, complying with Conservation and Management Measures (CMMs), making financial contributions, and providing scientific and technical support to developing countries. Korea's contribution to the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) is an exemplary one, where Korea is conducting an analytic study on the Antarctic krill. In addition, Korea contributed towards the balanced management and commercial use of Antarctic toothfish.

2) Arctic policy and fisheries cooperation: Korea's policy for the promotion of Arctic activities

One of the main tasks in Korea's Arctic Master Plan is to pursue international cooperation and fisheries resources surveys in the Arctic Ocean. The task specifies promoting cooperation with other countries and regions, including RFMOs, and following regulation trends in Arctic fisheries in preparation for a possible future when fishing becomes permitted in the Arctic Ocean. More specifically, these tasks include follow-up activities to the CAOF Agreement; active participation in the development of joint research programs at the Scientific Experts on Fish Stocks in the Central Arctic Ocean (FiSCAO); active participation in the discussion of agenda items for the North Pacific Fisheries Commission (NPFC); and increasing Korea-led research on protecting fishery resources and ecosystems in the Arctic high seas by utilizing the *Araon*, Korea's icebreaking research vessel.

3) Examples of cooperation with Indigenous People applicable to the implementation of the CAOF Agreement

One of the important points regarding cooperation in the CAOF Agreement is the consideration and utilization of "the Arctic Indigenous People's knowledge." At the First Preparatory Meeting of Signatories to the CAOF Agreement held on May 29-30, 2019 in Ottawa, Canada, the issue of utilizing Indigenous Knowledge and Indigenous People's participation in scientific research was also discussed as an agenda item.

An example of Korea's cooperation with Arctic Indigenous People includes participation by KMI in the AIA's Arctic Council AMIUM project. The aim of this project is to develop a tool that combines technology, knowledge, and software so that Arctic coastal Indigenous communities can use the ocean in a scientifically sound way. Another example is Korea's participation in the Arctic Council SDWG's AREA Phase II project in 2017. In addition, Korea has been collaborating with the University of the Arctic (UArctic) since 2015 to cohost the Arctic Academy, an educational program about the Arctic that takes place in Korea and includes participants from Indigenous Arctic communities. Responses to these and other examples of Korean cooperation with the Arctic Indigenous society have been positive.

4) Bilateral Arctic cooperation meetings

Korea has been regularly holding bilateral Arctic cooperation meetings with six Arctic states: Canada, Russia, Iceland, Denmark, Finland, and Norway. With China and Japan, a cooperation mechanism at the national

level, a trilateral high-level dialogue on Arctic cooperation, is in place, which is held annually. Also, there exists a North Pacific Arctic Research Community (NPARC) as a cooperation platform for the three Northeast Asian countries at the experts' level. In particular, the Arctic cooperation platform for the three Northeast Asian states could possibly grow in importance as a platform for developing one voice for the non-Arctic parties to the CAOF Agreement.

Future Prospects and Recommendations

The role of Arctic marine cooperation in implementation of CAOF Agreement

The 11th Arctic Council Ministerial Meeting, held in May 2019, attracted much attention because of two issues. For one, the 2019 Ministerial Meeting set a precedent: it was the first time the eight Arctic member states failed to adopt a joint declaration since the Arctic Council was created in 1996, due largely to the unilateral insistence of the United States that all references to climate change be omitted from the declaration. As a result, uncertainty and instability surrounding Arctic Ocean governance has been growing. This, ironically, is the reason why marine cooperation in the Arctic needs to be strengthened. The CAOF Agreement adopts as basic principles the need for cooperation between Arctic states and non-Arctic states, who are all stakeholders regarding Arctic fisheries management and its use. It also emphasizes cooperation among countries for conservation of the marine environment and marine resources. The importance of Arctic marine cooperation is expected to grow, so that it can help address conflicts arising from resource competition, military activities, and security issues in the Arctic Ocean, and provide opportunities for cooperation.

Future prospects

After the signing ceremony of the CAOF Agreement held in October 2018, the First Preparatory Meeting of Signatories to the CAOF Agreement was held in Ottawa, Canada from 29 to 30 May 2019. At this meeting, the results from the FiSCAO meeting were shared, and topics such as utilizing

Indigenous Knowledge and Indigenous Peoples' participation in scientific research, the establishment of a Provisional Scientific Coordinating Group (PSCG), operationalizing the JPSRM, and Conservation and Management Measures (CMM) for experimental fishing and management were discussed. The First CAOF Agreement Preparatory Conference is expected to take place in 2020.

However, there are still many hurdles that need to be overcome in implementing the CAOF Agreement. Some of them include finding scientifically sound ways for monitoring and information sharing, developing specific implementation measures for experimental fishing, conducting an assessment on fishery resources, making a socioeconomic impact assessment of the fishing industry on Asian and Arctic states, establishing a mechanism for managing the post-Agreement implementation measures, promoting cooperation among the parties and the issue of participation by new stakeholders, and implementing ways of utilizing Indigenous Knowledge and participation of Indigenous Peoples in scientific research.

Based on these issues, the next section will examine what needs to be considered for developing CAOF Agreement implementation measures.

Recommendations

In the future, SDG 14.4, which promotes adopting measures to end illegal, unreported, and unregulated fishing and implementing science based management plans, should be utilized as the underlying principle for cooperation among the CAOF Agreement parties. This is because there is a close relationship between establishing a mechanism for fishery resources management in the Arctic high seas and preventing IUU fishing that the CAOF Agreement intends to address. Keeping this principle in mind, things that should be considered during implementation phase are as follows:

1) Promoting rapid ratification of the Agreement

Under Article 11 of the CAOF Agreement, ratification by all 10 signatories to the Agreement is needed in order for the Agreement to come into effect. As of May 30, 2019, Russia (January 29, 2019), the EU (March 4, 2019), and Canada (May 29, 2019) have completed the ratification process. The United States is expecting to complete its own ratification process. Currently in Korea, the legislative office is in the process of examining

the Agreement to begin the national process. As specific implementation measures gain momentum, the question of expanding the number of parties to the Agreement could be addressed after the CAOF Agreement comes into force. Therefore, its ratification by all signatories should be prioritized.

2) Regulation on the role of RFMO

The CAOF Agreement expressly points to the establishment of an RFMO. Currently, the Agreement is at a stage where signatories are pursuing pilot programs and joint scientific surveys, such as pursuing the establishment of a scientific committee and utilizing the results from FiSCAO. However, in the process of developing specific implementation measures, there is a need to clearly define the role of RFMO that the Agreement seeks to establish. This is because depending on what kind of function the RFMO is established for, the decision on expanding membership to other stakeholders of Arctic high seas fisheries outside the initial signatories to the Agreement could be determined accordingly.

3) Developing plans for sharing best practices

There is a need to develop measures that will enable the sharing of best practices practiced by CAOF parties. These may include the examples of RFMOs, including the North East Atlantic Fisheries Commission (NEAFC) and the Northwest Atlantic Fisheries Organization (NAFO), so that they can serve as references in developing implementation measures of the Agreement. The CAOF Agreement is expected to make use of the FiSCAO and establish and operate a scientific committee after the Agreement comes into force. In particular, it is expected that the scientific committee will share and collaborate with existing RFMOs, Arctic Council, and organizations like PICES and ICES in order to carry out scientific surveys and monitoring programs. Also, sharing a case where Indigenous and local knowledge were used together with scientific knowledge and produced outcomes could also help in expanding Indigenous participation with regard to the Agreement.

4) Balancing the CAOF Agreement with other Arctic agenda items

The management and development of fishery resources in the Arctic Ocean should be pursued under a comprehensive mechanism for management that promotes international cooperation. It should also take into consideration the discussion of agenda items such as responding to

climate change, protecting the marine environment, using the Arctic sea route, building Arctic infrastructure, and protecting the livelihoods of Indigenous People, as they are all issues that have direct or indirect relation with the use and protection of fishery resources. Therefore, pursuing joint scientific surveys and experimental projects should be done while considering a broad set of issues that are being discussed in the Arctic. Furthermore, ongoing discussions should be developed in connection to issues being discussed regarding the BBNJ.

5) Making use of multi-layered discussion platforms

The CAOF Agreement is the first Arctic agreement that also includes non-Arctic coastal states such as Korea, China and Japan as Parties. Also, it leaves open the possibility of an increase in the number of participating stakeholders for developing a consensus on Arctic fisheries. Accordingly, there needs to be more discussion with regard to the entering into force of the Agreement and the admittance of new stakeholders to the Agreement. For this purpose, the consensus needed for the implementation of the CAOF Agreement could be built at international Arctic forums like the Arctic Frontiers, Arctic Circle Assembly, and Arctic Partnership Week in Korea.

The year 2020 marks the 10th anniversary of NPAC, which is a conference that has been recognized for having made contributions to increasing global awareness of the importance and the value of the Arctic through discussion on Arctic issues by renowned scholars and experts. Discussing agenda items related to the CAOF Agreement at NPAC could also be another option too.

A Perspective from China

Guifang (Julia) Xue

Main Legal and Political Challenges in Implementing the CAO Fisheries Agreement

The Agreement to Prevent Unregulated Commercial Fishing on the High Seas of the Central Arctic Ocean (CAOF Agreement) was signed on 3 October, 2018 in Ilulissat, Greenland by five Arctic states (the Russian Federation, the Kingdom of Denmark, the United States, Canada, and Norway), as well as four non-Arctic countries and the EU, which are listed in Article 9 (1) and known as Arctic five plus five (A5+5).

As the first regional fisheries agreement, the CAOF Agreement is characterized by a strong precautionary potential, as it was adopted prior to the initiation of commercial fishing in specific Arctic areas. It reflects the current legal framework concerning conservation and sustainable use of fisheries resources on the high seas, including both a precautionary approach and ecosystem-based management.[1]

In particular, it bases itself on the UNCLOS provisions stipulated in Article 116-119 and 1995 UN Fish Stocks Agreement (FSA) on straddling fish stocks and highly migratory fish stocks. Meanwhile, the CAOF Agreement mirrors management principles and measures of the "soft laws" concerning fishing activities, such as the FAO Code of Conduct for Responsible Fisheries. The agreement also interacts with the existing RFMO/As relevant to the CAO, such as the North East Atlantic Fisheries Commission (NEAFC), though the Parties are limited to Denmark (with respect to the Faroe Islands and Greenland), the EU, Iceland, Norway and Russia.

It is uncertain how long it will take for its implementation according to Article 11, but due to direct or indirect connections with a series of traditional regulatory machinery and regional arrangements, the CAOF Agreement may face some legal and political challenges briefly listed below.

First, there is an issue of uncertainty. The Agreement implies strong uncertainty with regard to future Arctic fishing activities that will also provide for the conservation of fish stocks and marine ecosystems in CAO, due to a lack of scientific data and knowledge about the environmental impact of any potential commercial fisheries.[2] In order to avoid potential

threats from commercial fishing in the CAO, the Agreement takes a precautionary approach for the emerging issues. It will have to deal with the stability and certainty of law, but also will require the flexibility to adapt to the development of ecological, political, and economic changes. This is absolutely a tough task, as a precautionary agreement is easier to reach without certainty and knowledge, but will face implementation challenges as more information becomes available.

Second, the CAOF Agreement seems somewhat paradoxical. It is explicit that the Agreement is intended for the conservation and sustainable use of the CAO fisheries ecosystem, yet its preamble underscores that commercial fishing is "unlikely to become viable" in the CAO in the near future. Quite obviously, the expression "*interim* conservation and management measures" used in Article 3 seems to suggest a temporary feature and future changes. In the same fashion, Article 3(1) allows the Parties to authorize their flagged vessels to conduct commercial fishing in accordance with conservation and management measures that "have been or may be established." Does this mean commercial fishing shall comply with existing measures? The problem is, a RFMO/A will be established due to future development, but does this mean commercial fishing shall comply with the existing interim measures or measures to be adopted?

Third, a compatibility issue may arise between coastal and high seas fisheries management in the CAO for the Agreement's future implementation. The CAOF Agreement does not intend to conflict with the existing fisheries regime, so the defined area is not described as "beyond national jurisdiction" (Article 1(a)).[3] Meanwhile, the "fish" defined in the Agreement does not include "sedentary species" specified in Article 77 of the UNCLOS. As it is hard to classify in practice some species as "sedentary" or "non-sedentary," it would be more difficult to regulate and enforce the commercial fishing of certain non-native sedentary stocks, such as snow crab.

Fourth, the relationship between the CAOF Agreement and other regional agreements is unclear. There is no express reference to the Joint Russian-Norwegian Fisheries Commission, for example, or to the Commission's theoretical competence to manage fisheries in the CAO. It is not clear why this omission occurs, but one situation could be that Norway and Russia were not able to convince the other parties to include such a reference. Then it is unclear whether commercial fishing activities conducted under the auspices of the Commission would be "unregulated" and thus fall within the scope of the CAOF Agreement's interim measures

concerning unregulated fishing. Moreover, the spatial overlap with the Regulatory Area of NEAFC is unclear as well. The CAOF Agreement Area does not exclude the portion of the high seas area of the CAO that falls within the NEAFC Convention Area. All the NEAFC members participated in the negotiations and concerned the fact that an additional future RFMO/A needlessly creates a regulatory overlap. On the other hand, the representation of the NEAFC members in the CAOF Agreement will likely avoid a conflict between those two regimes, particularly in the decision-making procedures.

Fifth, finding ways to make the transition "effective" [Article 13(3)] is not an easy task. The "sunset clause" in Article 13 indicates the transition feature of the Agreement, an initial 16 years with successive five-year extensions in the absence of formal objections to an extension. Yet making the transition "effective" could be more challenging than the negotiation of the agreement, as it will require substantive political will. The Agreement encourages cooperation of scientific activities, and states that a Joint Program of Scientific Research and Monitoring shall be established within two years after entry into force of the Agreement. It also requires data sharing and scientific meetings to guarantee timely scientific information to the Parties. However, it remains to be seen how to operate for scientific research and data sharing among the Parties.

Sixth, non-commercial fishing activities are not regulated in the CAO. The CAOF Agreement, drafted as a precautionary approach, may be better defined as a precedent agreement regarding the commercial fishing on the high seas of the CAO. However, non-commercial fishing activities are not regulated in the CAO. Article 5(1) mentions that conservation and sustainable measures for exploratory fishing shall be established and the sub-clauses set conditions to start fishing and require Parties to notify other Parties of its plans and get comments from them. The question is: what if the other Parties object to the exploratory fishing plan? The Parties are also obliged to "adequately monitor any exploratory fishing" and report the result, but how does one define "adequate"? The interpretation of "*any*" is also problematic. If it means *any* exploratory fishing activities, no matter which Party authorizes it, then any Party could monitor exploratory fishing that is authorised by itself and/or by other Parties as well, which could be used as a political means to attack the other Parties.

Seventh, the issue of participation remains ambiguous. The Agreement is open to non-parties with "a real interest," but also by those with

invitations by the Parties and with the consensus agreement of the Parties. As a result, all 10 existing Parties must accept any new Party. This could be a tough threshold for other States to join in. More importantly, how does one define "real interest"? This definition alone could cause controversies among the Parties, and invite possibilities to make political or other deals.

Eighth, the issue of enforcement looms large. Non-parties already enjoy the freedom of the high seas and have rights and obligations under other international instruments (if they are Parties to the instruments). Article 8 entitled the Parties to "deter" vessels with non-Parties flags, whose activities undermine the Agreement. Does this then entitle the Parties to hold some kind of "jurisdiction" in the area? What kind of measures can the Parties take under international law? In case any dispute occurs, how (and where) shall the Parties settle the dispute and interpret the Articles? Article 7 of the Agreement only applies to the Parties, and the 1995 FSA shall apply to the disputes relating to the Agreement, even if a Party is not Party to the 1995 Fish Stock Agreement (such as China).[4]

In addition, questions about the decision-making process could also be problematic with regard to substantive matters to be decided by consensus with no formal objection. Most questions can be deemed as issues of substance [Article 6(3)], and adoption of management measures may face the potential of being blocked by any Party. However, with strong political will, these legal challenges could be substantially reduced. Therefore, concerted actions by the A5+5 are crucial for the implementation of the CAOF Agreement and success of conservation and sustainable use of these regional fish stocks.

How Does China Perceive the Relationship between Arctic-specific Governance Arrangements and the Law of the Sea Convention?

China released a White Paper on its Arctic Policy (White Paper) on January 26, 2018.[5] Although the last to announce an Arctic Policy among the Arctic and "near" Arctic states, the White Paper serves as the first and foremost comprehensive official statement that reviews China's Arctic practice over the past decades. It also functions as a guideline to instruct China's future participation in Arctic affairs in light of policy positions, goals, and basic principles towards international governance of the Arctic. China's view

on the legal status of the Arctic, international law in general, and specific regional arrangements in particular may be summarized as follows.

China's views on the Arctic and international legal framework

With no single comprehensive treaty governing Arctic affairs, international law, including the UNCLOS, forms the essential legal basis for states within and outside the Arctic region to carry out marine activities with respect to navigation, fishing, oil and gas exploitation, protection of the marine environment, maritime delimitation, and dispute settlement. Seven of the eight Arctic States (the exception being the United States) are Parties to UNCLOS. Though not having yet joined UNCLOS, the United States accepts it as customary international law.[6] In addition, a number of global international treaties are also applicable to the Arctic, including the 1995 Fish Stocks Agreement, the 1993 Compliance Agreement, the 1995 Code of Conduct for Responsible Fisheries, the 2001 IPOA-IUU Fishing, and the 2009 Agreement on Port State Measures.

As stated in the White Paper, China respects the existing international legal framework governing the Arctic, particularly the UNCLOS. As specified in the White Paper, "China enjoys the freedom or rights of scientific research, navigation, overflight, fishing, laying of submarine cables and pipelines, and resource exploration and exploitation in the high seas, the Area and other relevant sea areas, and certain special areas in the Arctic Ocean, as stipulated in treaties such as the UNCLOS and the Spitsbergen Treaty,[7] and general international law."[8] Indeed, China has engaged largely in the activities under international law in the subjects related to the Arctic science and environment.[9] China also looks for potential utilization of the Arctic navigation routes, natural resources, tourism, etc.

As restated in the "White Paper" and other official statements, China participate in Arctic affairs as a "non-Arctic State." China accepted the legal status of the Arctic in the context of international law, in that the Arctic is a region that encompasses areas over which different states have sovereignty, sovereign rights, and jurisdiction, as well as areas including the high seas and the international seabed "Area" beyond national jurisdiction. Only the high seas and the Area of the Arctic belong to the global domain. China respects sovereignty and sovereign rights of the Arctic States and promotes peace and stability in the Arctic. China seems proud of its involvement in the Arctic affairs since its accession to Spitsbergen Treaty in 1925, and

its more active engagement since it joined the International Arctic Science Committee in 1996.

China's views on the Arctic-specific governance arrangements

Dealing with a fragmented governance framework, China takes a practical approach towards the Arctic specific arrangement. Part IV of the White Paper points out China's positions on the existing legal order and mechanisms related to the Arctic. It states that "China takes an active part in the international governance of the Arctic," and "upholds the current Arctic governance system with the UN Charter and the UNCLOS as its core, plays a constructive part in the making, interpretation, application and development of international rules regarding the Arctic, and safeguards the common interests of all nations and the international community."[10] The White Paper further indicates that "China is committed to the existing framework of international law including the UN Charter, UNCLOS, treaties on climate change and the environment, and relevant rules of the International Maritime Organization, and to addressing various traditional and non-traditional security threats through global, regional, multilateral and bilateral mechanisms, and to building and maintaining a just, reasonable, and well-organized Arctic governance system."[11]

Specifically, China respects treaties or provisions related to the Arctic, including Article 234 of the UNCLOS on "ice-covered areas," 1920 Spitsbergen Treaty, IMO 2014 "Polar Code" (International Code of Safety for Ships Operating in Polar Waters), and CAOF Agreement. China has followed closely as an observer to the Arctic Council for its legal instruments, such as 2011 Search & Rescue Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, the 2013 Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic, and the 2017 Agreement on Enhancing International Arctic Scientific Cooperation. China also keep notice about the "soft law" documents adopted by the Arctic States, such as the 2008 Ilulissat Declaration and 2015 Oslo Declaration Concerning the Prevention of Unregulated High Seas Fishing in the Central Arctic Ocean.

China takes seriously the national legislation of the Arctic States pursuant to the UNCLOS, such as to establish territorial seas, EEZs and the extent of continental shelf, and maintain ongoing communication at bilateral level to the implementation and practical impact. For instance,

China makes shipping arrangement with Canada and Russia for the Northwest Passage and Northern Sea Route.[12] China participates in regional platforms, such as Norway's "Arctic Frontiers," Iceland's "Arctic Circle," Russia's "The Arctic: Territory of Dialogue," and the United States' "Conference on Global Leadership in the Arctic."

With the newly released Arctic Policy, China will maintain the status quo as a key player, and seek for opportunities to boost its interests in economic development and trade. While implementing its Arctic policy, China will advance its cooperative effort so as to make positive contribution to Arctic affairs.

The Position of China with Regard to Unsettled Outer Delimitation of Continental Shelves in the Arctic Ocean

China itself has a unique position towards the continental shelf (CS), and insists on the principle of natural prolongation to delineate the outer limit of CS with its maritime neighbors. China has made its submission to the CLCS (Commission on the Limit of Continental Shelf) for its extended continental shelves (ECS) beyond 200 nm in the East China Sea.[13] Based on its policy position and state practice, China supports peaceful negotiation for states to resolve their maritime disputes, and expects Arctic states to settle their boundary lines through negotiation and cooperation just as those already in place.[14] However, the situation in the Arctic has been complicated due to the non-party issue and different interpretations of the UNCLOS regime and the role of CLCS. [15] Four Arctic States, namely Russia, Norway, Denmark (Faroe Islands and Greenland), and Canada (23 May 2013) have made their claims for extended continental shelves in the Arctic Ocean.[16] So far, only Norway's submission has received recommendation from the CLCS (2009); the other submissions (Russia, Denmark and Canada) are still pending.[17] Russia has overlapping claims over the outer continental shelf with Canada and Denmark respectively, which has been a matter of contention among the States concerned.[18]

The Arctic region arguably consists of high seas and international seabed area ("the Area"). In case Arctic states claim excessive CS and/or ECS to the Arctic seabed and subsoil, the regime of the continental shelf is relevant, and the Area in the Arctic may be correspondingly reduced. Therefore, the delimitation of ECS affects not only the Arctic States, but

also the international community with respect to states with an interest in the mineral resources of the Area, though current activities have not yet expanded to the exploration and exploitation stage of the CAO and its deep seabed. With the ongoing IGC negotiation process of BBNJ (biodiversity beyond national jurisdiction) as a legally binding instrument, it also remains to be seen whether the legal regime of the Area could extend to some portions of the CAO deep seabed.

As a non-Arctic State, China's interests at this stage seem unlikely to be affected immediately or directly by the unsettled outer delimitation of CS of the Arctic Ocean. China recognizes Arctic states' legitimate (consistent with the UNCLOS) claims, rights and interests, but would be vigilant about excessive claims to national jurisdiction over the sub-soil and seabed areas in central parts of the Arctic Ocean. For China, the Arctic's actual and potential value in terms of climate, resources, and commercial shipping go beyond regional issues. In fact, defining the outer limit of ECS of the CAO also affects global geopolitics, which involves part of China's strategic interest. In this sense, the maritime delimitation of the Arctic Ocean is not only about settling the outer limits for each Arctic state, but is also closely related to fishing, resource exploitation, environmental protection, ecosystem biodiversity, and scientific research for non-Arctic states. As always, China supports peaceful negotiation for states to resolve their maritime disputes, and Arctic states are best placed to settle the outer delimitation of CS by themselves through negotiation and cooperation.[19]

Notes

1. Valentin Schatz, Alexander Proelss, and Nengye Liu, *The 2018 Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean: A Primer*, Oct 26, 2018. https://www.ejiltalk.org/the-2018-agreement-to-prevent-unregulated-high-seas-fisheries-in-the-central-arctic-ocean-a-primer/ (accessed on July 12, 2019)
2. Rosemary Rayfuse, "The Role of Law in the Regulation of Fishing Activities in the Central Arctic Ocean," *Marine Policy*. https://doi.org/10.1016/j.marpol.2019.103562, p.2.
3. Valentin Schatz, Alexander Proelss, and Nengye Liu, *The 2018 Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean: A*

Primer, Oct 26, 2018. https://www.ejiltalk.org/the-2018-agreement-to-prevent-unregulated-high-seas-fisheries-in-the-central-arctic-ocean-a-primer/ (accessed on July 12, 2019)

4. Valentin Schatz, Alexander Proelss, and Nengye Liu, *The 2018 Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean: A Primer*, Oct 26, 2018. https://www.ejiltalk.org/the-2018-agreement-to-prevent-unregulated-high-seas-fisheries-in-the-central-arctic-ocean-a-primer/ (accessed on July 12, 2019)
5. State Council, "Information Office of the People's Republic of China (SCIO)," *China's Arctic Policy* (Beijing: Foreign Languages Press, 2018).
6. See United States Oceans Policy, Statement by the President Reagan on March 10, 1983. available from: https://www.state.gov/documents/organization/143224.pdf. See also J. Ashley Roach, "Today's Customary International Law of the Sea," *Ocean Development & International Law* 45, no. 239 (2014): 239-259.
7. The Spitsbergen Treaty, signed on 9 February 1920 and came into force on 14 August 1925, allows the nationals of the High Contracting Parties to enjoy the access and entry to certain areas of the Arctic, as well as the right to carry out, industrial and commercial activities such as hunting, fishing, and mining in these areas on an equal basis, in accordance with local law. China acceded to the Treaty on 1 July 1925. See "Treaty recognizing the sovereignty of Norway over the Archipelago of Spitsbergen, including Bear Island" (in French). Ministry of Foreign Affairs of France (depositary country). See also https://www.jus.uio.no/english/services/library/treaties/01/1-11/svalbard-treaty.xml. For discussions, see Xinmin MA, "China's Arctic policy on the basis of international law: Identification, goals, principles and positions," *Marine Policy* 100 (2019): 265-276.
8. For a fuller account, see Nengye Liu, "China's emerging Arctic polity: What are the implications for Arctic governance?," *Jindal Global Law Review* 8, no. 1 (2017): 55-68.
9. The gradual change of the Arctic environment has a direct impact on China's climate, environment, agriculture, shipping, trade as well as social and economic development. See Xinmin MA, "China's Arctic policy on the basis of international law: Identification, goals, principles and positions," *Marine Policy* 100 (2019): 265-276.
10. China's Arctic Policy, 17.
11. China's Arctic Policy, 8.
12. The Rules stipulate a permit system for navigation on the Northern Sea Route, and establish the Northern Sea Route Administration to regulate the shipping on the Northern Sea Route, including to process applications for navigation in the

area. Earlier laws and regulations include the 1990 Regulations for Navigation on the Seaways of the Northern Sea Route, the 1996 Guide to Navigating Through the Northern Sea Route, the 1996 Regulations for Icebreaker and Pilot Guiding of Vessels through the Northern Sea Route, and the 1996 Requirements for the Design, Equipment, and Supplies of Vessels Navigating the Northern Sea Route.

13. UNCLOS, Article 76(8) awards the CLCS the mandate to give "recommendations" to the outer limit of the continental shelf. Any "claim" in contradiction to a recommendation made by the CLCS constitutes a violation of UNCLOS.

14. Denmark and Canada settled their boundary line in 1973 to the northern part of the Atlantic Ocean and the Barents Sea, Norway and Denmark in 2006, and Russia and Norway in 2007 and 2010. For discussions, see Dita Liliansa, "Outer Limits of Continental Shelf in the Arctic Ocean: Potential Overlapping Claims," *Indonesian Journal of International Law* 12, no. 3 (2015): 337-355.

15. The United States is not a Party to UNCLOS, and cannot submit information of extended continental shelves to the CLCS, but it also indicated to make a submission at a proper time in the future.

16. UNCLOS Art. 76 (6) contains a *lex specialis* on the maximum seaward limit with respect to "submarine ridges": in case a continental shelf covers parts of such a ridge, its outer limits shall under no alternative exceed 350 nautical miles. Ridge issue is of overwhelming importance in the Arctic Ocean as the Russian, Canadian and Danish "claims" comprise parts of the Lomonosov and Alpha-Mendeleev ridges. As of October 15, 2019, 12 submissions from five Arctic States have been lodged to the CLCS to define their ECS boundaries. For details on these submissions, see https://www.un.org/Depts/los/clcs_new/commission_submissions.htm. Russia made its submission on 20 December 2001, and re-submitted on 3 August 2015 upon the request of CLCS. The Russian claim applied a combination of both methods with an emphasis on the 2,500 meters isobaths rule that would provide for the most beneficial results, leaving only two "donut holes" (one alongside the Gakkel Ridge and the other one in the Canada Basin). Norway submitted in 2006 entitled: Continental Shelf Submission of Norway in respect of areas in the Arctic Ocean, the Barents Sea and the Norwegian Sea Executive Summary, https://www.un.org/Depts/los/clcs_new/submissions_files/nor06/nor_exec_sum.pdf.
    Denmark submitted on 29 April 2009 concerning the area north of the Faroe Islands, with the request agreed among the three concerned States, and the Danish submissions concerning Greenland are still under process. See the Executive Summary at: https://www.un.org/Depts/los/clcs_new/submissions_files/dnk28_09/dnk2009executivesummary.pdf, p.13.

17. Continental Shelf Submission of Norway in respect of areas in the Arctic Ocean,

the Barents Sea and the Norwegian Sea Executive Summary. https://www.un.org/Depts/los/clcs_new/submissions_files/nor06/nor_exec_sum.pdf

18. For discussions, see C. Cineli, "The Law of the Sea and the Arctic Ocean," *Arct. Rev. Polit. Arctic Review on Law and Politics* 2, no. 1 (2011): 4-24.

19. Dita Liliansa, "Outer Limits of Continental Shelf in the Arctic Ocean: Potential Overlapping Claims," *Indonesian Journal of International Law* 12, no. 3 (2015): 337-355.

A Perspective from the Russian Federation

Viatcheslav Gavrilov

In recent decades, the situation in the Arctic has changed drastically. Global warming, which is responsible for much of the ice melting in the Arctic Ocean (AO), has also created expectations of economic expansion in the region. There is a connection between changes in climate conditions and increasing prospects of exploring and exploiting hydrocarbons and other mineral resources of the region, as well as expanding navigation (primarily the transportation of resources being exploited in the Arctic) and fishing areas.[1]

Energy has special meaning here. The prospect of exploiting Arctic resources has encouraged a discussion about an oncoming struggle between Arctic and non-Arctic States to gain access to those resources. The discussion about the establishment of the outer limits and delimitation of the Arctic States' continental shelves in the Arctic Ocean stirs up concerns over a potential conflict connected with the potential "partition" of the Arctic. It is evident that in order to reduce the risk of such a conflict and to intensify the protection of the Arctic States' interests, the international legal regime of the Arctic region needs to be clearly understood and implemented into the activities of the region's nations and organisations.

The significant volume and complexity of the above-mentioned issues do not allow me to fully examine them in this chapter. That is why only some of them will be examined, and the author's position will be presented on the following: 1) the formation and content of the Russian Arctic policy; 2) sources of the international legal regulation of Arctic status; and 3) the present stage and possible perspectives of the ongoing process of determining extended continental shelf boundaries in the Arctic Ocean.

Evolution of Russian Arctic Policy

For a long time, Russia has declared its special rights over coastal Arctic marine spaces. The first document to explicitly define them geographically is the Decree of the Presidium of the Central Executive Committee of the USSR of April 15, 1926, which proclaimed the lands and islands located in the Northern Arctic Ocean to be the territory of the USSR.[2]

The Decree is considered one of the most important legal documents that demonstrates Russia's historical adherence to the sector theory of Arctic delimitation.[3] But we should not forget that Russia did not initiate this sectoral approach; it only repeated what Canada had done earlier. Furthermore, Russia has never attempted to extend its sovereignty across the waters of this entire "Arctic sector" and thus to appropriate a significant part of the Arctic Ocean.

However, the "sector principle" still, to a large extent, determines Russia's vision for the geographical limits of the possible extension of its jurisdiction in the Arctic. That circumstance often plays against our country, for at the end of the day it is Russia itself that limits its possibilities in the Arctic and narrows the room for manoeuvring in political relations with other participants of the so-called "Arctic Race."[4]

It is sufficient to take a look at the maritime delimitation treaty concluded between Russia and the United States in 1990[5] to see that delimitations to a large extent was made on the basis of the eastern limit of the Russian "Arctic sector." For Russia, however, it would be more beneficial to draw boundaries based on the principle of "equidistant line" with respect to certain territories within the frameworks of this treaty.

Russia has always striven for and continues to act in the Arctic in accordance with norms of international law and on the basis of the authority that those norms confer (for example, Article 234 of the 1982 UN Law of the Sea Convention[6] (LOSC). This fact, as well as the necessity to promote the national interests of Russia, forms the keystone of Russian Arctic policy. It is obvious that the content and methods of implementing this policy may be adjusted depending on the global political climate, as well as on the level of cooperation and trust among Russia, Arctic States and other interested parties.

The turn of the millennium was a special period in the life of our country. It was a time when everyone expected that the actions of Russia, which withdrew from communist ideology with the collapse of the Soviet Union and declared its dedication to "universal human values," would be adequately interpreted and appreciated by the West. The Russian government sincerely believed that it would enjoy meaningful and equal status with the West and would be able to solve any difficult tasks—both of a social-economic and military-political nature—with its new partners, even if this meant compromising, at times, on our sovereignty.

The subsequent course of events, however, has clearly demonstrated

the gullibility of advocates for the theory of the shared, equitable and safe use of the Arctic as a common heritage of mankind by all interested states. Some political forces in Western countries treated the readiness of Russia for large-scale cooperation as a sign of weakness and as readiness to compromise on its interests on the global stage. As a result, the West stopped perceiving Russia as a state that should be dealt with on an equal footing. Sanctions imposed by the U.S. and European countries restricting the transfer of technologies, equipment and investments have significantly hampered Russia's ability to implement existing and to develop future Arctic oil and gas projects, as well as to develop port and other infrastructure projects along the Northern Sea Route.

These circumstances have had a serious impact on Russia's Arctic policy. Its renewed approach to the Arctic supports the thesis that Russia should be firm in defending its legitimate rights and national interests in the region. In terms of Russian domestic policy, the focus is on ensuring comprehensive social-economic and technological development and environmental protection of Russia's Arctic Zone.

Thus, it is important to understand that in the 1990s and at the beginning of the twenty-first century, Russia was ready to talk about comprehensive international governance of the Arctic. Today, however, it will remain engaged in discussions about intergovernmental cooperation in the Arctic only if there are guarantees that Russia's national interests will be taken into account. It should also be understood that some of these interests may differ from the interests and expectations of other Arctic or interested states.

Arctic Governance Issues and the LOSC

Two key documents delineate current Russian Arctic policy: 1) *Basics of the State Policy of the Russian Federation in the Arctic;*[7] and 2) *The Strategy of the Development of the Arctic Zone of the Russian Federation.*[8]

The first expressly emphasizes that today, "national interests determine basic objectives, primary goals and strategic priorities of the state policy of the Russian Federation in the Arctic. The realization of national interests of the Russian Federation in the Arctic is provided by institutions of state power together with institutions of civil society, in strict conformity with the legislation of the Russian Federation and its international treaties" (para. 5).

It is especially important to note the second part of the abovementioned thesis, for it clearly shows that Russia, while focusing on the realization of its national interests, continues to be a responsible international actor that behaves in the international arena in line with principles and norms of international law and its international commitments. That is why, even today, the LOSC, the 2008 Ilulissat Declaration, agreements, directions and recommendations of the Arctic Council, the Polar Code, and relevant multilateral and bilateral agreements should all be considered as parts of the legal basis for Russia's Arctic strategy.

It is well known that certain conflicts exist between supporters of the "internationalization" of the Arctic Ocean (AO) legal status by means of increasing the role of the LOSC on the one hand, and advocates of the AO special legal regime based primarily on the regional and bilateral cooperation of the Arctic States under the paramount importance of customary international law on the other. The second point of view is based on a thesis that Coastal States in the Arctic (Arctic 5) have special legal rights and obligations that proceed from their multi-year activity in developing Arctic areas and resources and stipulate the priority of regional regulation over the universal one in this part of the globe.

The latter position is still widespread in Russia, although it is difficult to agree with that. I consider the contraposition of universal and regional international legal sources covering the legal status of the Arctic or justification of their selected implementation in certain situations unproductive. The error of such an approach can be proved, *inter alia*, by the fact that a considerable number of legal and other issues in the region have already been and are being resolved on the basis of the LOSC (delimitation of internal waters, the territorial sea, the exclusive economic zone, the continental shelf, etc.).

Moreover, a deeper analysis shows that in fact there are no irreconcilable contradictions between the provisions of LOSC and other universal treaties, on the one hand, and norms of regional agreements and customary rules, on the other. The first category in most cases recognizes the necessity of taking into account certain historical, subjective, geographical, and other features when regulating relations in the sphere of the law of the sea or, for example, environmental law that provides for special procedures for coordination among parties in this context. In other words, universal international treaties leave room for a possibility to enter into specific regional or bilateral agreements and to adopt by certain states their national laws on the issues

highlighted in the LOSC and other multilateral treaties.

That is why in determining the legal status of the Arctic Ocean, it is important to rely on the established international regulatory framework of states' relations in that area and to take into account both universal international legal agreements and acts of a regional and bilateral nature, as well as relevant decisions made by international institutions.

Determination of Extended Continental Shelf Boundaries in the Arctic Ocean

In this area, the key issue involves finding the correct answer to this question: How should Articles 83 and 76 of the LOSC relate to each other when delimitating the continental shelf of the Arctic?

At first, it would seem that, according to Article 83 of LOSC, the five Arctic coastal states should be able to answer this question exclusively on the basis of a relevant agreements among themselves, without resorting to the Commission on the Limits of the Continental Shelf (CLCS or the Commission). However, pursuant to Article 76, Arctic States shall establish the outer limits of their continental shelves in the central part of the Arctic Ocean only on the basis of recommendations of the Commission, which therefore becomes crucial to answering the question of the mere possibility for the Arctic 5 to enter into an agreement on shelf delimitation near the Arctic pole.

As of today, delimitation lines of shelves of adjacent Arctic States have been completely legally established only with respect to the northern part of the Atlantic Ocean and the Barents Sea in agreements between Denmark and Canada of 1973[9], Norway and Denmark of 2006[10] as well as in two Russo-Norwegian agreements of 2007[11] and 2010.[12]

The delimitation in the eastern AO still has not received proper legal regulation. It concerns, first, the border of the United States and Canada in the Beaufort Sea. Besides, despite the existence of the Soviet-American agreement on the Maritime Boundary of 1990, the process of relative spaces' delimitation in the AO also cannot be considered finished. In addition, this Agreement is currently only being applied on a temporary basis.

With a closer look at the above bilateral treaties and processes, it is not difficult to discover that, though there has been significant progress in the continental shelf delimitation by the Arctic 5 States inside their EEZs,

they have failed to come to an agreement concerning its delimitation in the central part of the AO. Those states directly or indirectly rely on receiving recommendations from the Commission, which should give an answer to the big question of where the outer limits of the continental shelf (OLCS) should lie in this part of the globe.

As of today, all four coastal Arctic States that have ratified the LOSC —Canada, Denmark/Greenland, Norway and Russia—have applied to the CLCS for those recommendations. However, the Commission has provided those on OLCS for only one of them, namely Norway. The remaining three submissions significantly overlap each other. In this situation, it is evident that the continental shelf of the central part of the AO may be finally delimitated only on the basis of an agreement between the Arctic States since:

1) The LOSC empowered the CLCS to take decisions solely on the establishment of the continental shelf outer limits rather than its delimitation between the States;
2) In their submissions, Canada, Denmark, and Russia asked that recommendations of the Commission be taken without prejudicing the process of the delimitation of continental shelf boundaries with the other States—and that after the Commission issues its recommendations, the final decision shall be made in accordance with Article 83 of the LOSC; and
3) The definitive delimitation of the AO shelf is impossible without the participation of the United States, which is not party to the LOSC and formally has no obligation to apply to the CLCS for recommendations.

However, one should hardly expect that the negotiation process on the determination of extended continental shelf boundaries in the AO will start without at least first recommendations of the Commission concerning Russia's OLCS in the Arctic. Submissions of Russia, Denmark and Canada clearly demonstrate their intentions to treat procedures stipulated in the LOSC Article 76 (8) as a necessary precondition to the full-scale implementation of provisions of Article 83.

Nevertheless, the above-mentioned does not necessarily mean that the Commission serves as no more than an expert body capable only of authoritatively confirming or discouraging the vision of the Arctic States regarding the outer limits of their shelves or stressing the necessity to

conduct further research in that respect. It is primarily explained by the fact that after having considered the existing submissions, the Commission may come to a conclusion on the presence outside the Arctic States' EEZs of areas of deep ocean floor, to which should be applied the legal regime stipulated in Part XI of the Convention.

If the Commission finds this to be the situation, it would mean that the States, while negotiating the establishment of their continental shelves' limits in the central AO and to be conducted pursuant to Article 83 of the Convention, will not be able to draw relevant delimitation lines through such Areas or to determine that northern terminus of their shelves lie within.

Moreover, it should not be forgotten that recommendations of the Commission may raise a question of the necessity to review already concluded delimitation agreements in cases where scientific data provided in a submission do not support entitlement to extended continental shelf for each of the involved States. Perhaps it is the reason why the content of the majority of Arctic States' agreements on the shelf delimitation clearly shows that their parties prefer to enter into boundary negotiations in relation to the shelf that extends beyond 200 nautical miles, only after receipt of recommendations from the CLCS, even if those arrangements do not prejudice the final agreement.[13]

It is evident that the implementation of such a two-step scenario for AO shelf delimitation (receiving CLCS' recommendations—concluding respective Agreements) will require a lot of time and effort. This is not only because of the lengthy examination of the States' submissions by the Commission, but is also due to the option of making a revised or new submission to the CLCS in case of disagreement with its recommendations, which may theoretically render this process nearly endless. However, despite such a possibility, it seems that the Arctic States are not interested in contrived delay of finding a solution to the issue of the AO seabed legal status and its continental shelf delimitation. That is why henceforth they will actively cooperate on that matter, varying the format of such cooperation from parallel bilateral or trilateral consultations to full-scale international conferences.

Notes

1. A.V. Zagorsky, "International Cooperation and Safety in the Arctic," in AV Zagorsky and AI Nikitin, eds. *International Cooperation in the Arctic: Safety and Development Issues* (Russian Political Science Association; Russian Political Encyclopedia, 2013): 29.
2. Decree of the Presidium of the Central Executive Committee of the USSR, 16 April 1926, *SZ SSR* (1926), no. 32, item 203.
3. See L. Timchenko, "The Russian Arctic Sectoral Concept: Past and Present," 1 *Arctic* 29 (1997): 50.
4. See R.S. Reid, "The Canadian Claim to Sovereignty over the Waters of the Arctic," 12 *Canadian Yearbook of International Law* 115 (1974); M. Byers and S. Lalonde, "Who Controls the Northwest Passage," *Vanderbilt Journal of Transnational Law* (2009): 1146-48.
5. Agreement between the United States of America and the Union of Soviet Socialist Republics on the Maritime Boundary, 1 June 1990. http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/PDFFILES/TREATIES/USA-RUS1990MB.PDF
6. United Nations Convention on the Law of the Sea, 10 December 1982, 1833 UNTS 397.
7. Russian Federation, "Basics of the State Policy of the Russian Federation in the Arctic for the Period untill 2020 and for a Further Perspective," 18 September 2008. http://www.arctis-search.com/Russian+Federation+Policy+for+the+Arctic+to+2020
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9. Agreement between the Government of the Kingdom of Denmark and the Government of Canada relating to the Delimitation of the Continental Shelf between Greenland and Canada, 17 December 1973, 950 *UNTS* 152.
10. Agreement between the Government of the Kingdom of Norway on the one hand, and the Government of the Kingdom of Denmark together with the Home Rule Government of Greenland on the other hand, concerning the delimitation of the continental shelf and the fisheries zones in the areas between Greenland and Svalbard, 20 February 2006, 2378 *UNTS* 21.
11. Agreement between the Russian Federation and the Kingdom of Norway on the Maritime Delimitation in the Varangerfjord area, 11 July 2007, 2526 *UNTS* 33.
12. Treaty between the Russian Federation and the Kingdom of Norway concerning

Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean, 15 September 2010, 2791 *UNTS* 3.

13. Mel Weber, "Defining the Outer Limits of the Continental Shelf across the Arctic Basin: The Russian Submission, States' Rights, Boundary Delimitation and Arctic Regional Cooperation," *International Journal of Marine and Coastal Law* 24 (2009): 675-676.

A Perspective on International Cooperation

Rachel Tiller

Passing the halfway point to the deadline, are treaty negotiations regarding the protection of biodiversity in areas beyond national jurisdiction en route to consensus?

Covering three fourths of the earth's surface area, the ocean is the world's largest ecosystem. The high seas alone cover more than 60 percent of this area, where nearly ten million tonnes of fish are harvested. This represents 15 percent of total global marine landed value, worth an estimated USD 16 billion.

The legal framework of ocean governance covering this area outside national jurisdiction is not operating in a void, yet it is largely fragmented and uncoordinated. The overall governance is comprised of a patchwork of regulatory schemes covering issue areas that include the protection of migratory birds, deep-sea mining, dumping of illegal wastes from ships, and pollution from land-based sources. In fact, there are at least 190 multi- and bilateral agreements covering issue areas such as these that affect the ocean, not including other forms of global governance, such as customary rule, working practice, or informal rules (Bigagli 2016).

The Central Arctic Ocean (CAO) is often imagined as a new frontier of sorts in this context. Speculations abound regarding the future potential of oil, gas and mineral extraction, ice-free Arctic shipping routes, increased fishing activities for valuable species (both new and old), as well as the potential of marine genetic resources (MGRs). The CAO lies largely outside areas that are under national jurisdiction, in an area with dangerous weather conditions, making governance issues even more complicated.

Many states are looking to expand resource extraction in these areas, both in the Arctic and across the globe. With this increased interest, combined with overfishing and lack of a global regulatory framework to govern these areas as a single unit, the pressure to create a set of comprehensive regulations governing these activities led to international consultation and a call to action. This culminated with the United Nations General Assembly resolution 69/292, which convened an intergovernmental conference in September 2018 to start negotiations towards a legally binding instrument to protect biodiversity in areas beyond national

jurisdiction (BBNJ), after more than 10 years of preparations. The negotiations will decide, among other things, which principles and sets of rules will govern the exploitation of newly valued MGRs. It will also identify to what degree technologically developed maritime states are willing to build the capacity of developing states. Areas of interest include defining the terms of marine exploitation and protection of resources in areas far removed from land, deciding to what degree there ought to be a global sharing of benefits of resources, and negotiating how to effectively implement area-based management tools in areas outside national jurisdiction. These negotiations are scheduled to conclude in spring, 2020.

As we are nearing the halfway point of the scheduled negotiations, the following paper assesses the path towards consensus on one of the most important governance mechanisms proposed since UNCLOS. We will concentrate on the two first rounds of negotiations that have already taken place (September 2018 and April 2019). Since no specific ocean area, including the CAO, is specifically discussed during the negotiations, we will frame our discussion broadly. First we will discuss some of the main challenges that have materialized during these sessions in general. It will be followed by an assessment of what must be included in the final treaty for it to not only reach consensus, but also be effective once ratified and implemented. We conclude by discussing the hybrid option for the form of the agreement and whether this lends itself to a realistic end of negotiations by consensus by spring 2020 as planned.

Conflict Dimensions in the BBNJ Negotiations

Though generally pleasant, good-natured and often filled with humor, the negotiations towards an agreement of protection of biodiversity in areas beyond national jurisdiction has a serious undertone with some clearly delineated lines of conflict that could challenge the chances of consensus. One of the most tangible conflicts emerged early during the negotiations between two blocs: developed versus developing nations. This broad theme had emerged during the preparatory meetings the decade before—and re-appears in other global negotiations arenas on ocean governance and climate change issues.

In this ocean governance setting, this developed/developing nations issue was exemplified with what Kraabel (2018) terms the “dichotomy of

principles," namely "*freedom of the seas*" versus the *common heritage of mankind (CHM)*, generally attributed to Hugo Grotius and Arvid Pardo[1] respectively (Gorove 1971; Grotius 1609). This ideological dichotomy has been particularly evident in the discussions around MGRs, and echoes many of the same challenges discussed during the negotiations of Part XI of UNCLOS (1982) as well, circling the divergent goals of developing and developed nations. During the third UNCLOS negotiations, the crux of the challenges around this dichotomy was that CHM implied at that time some a sort of sharing arrangement for the resources of this area. As such, the delegates of the developing states at that time believed that the resources of the deep seabed, particularly these nonrenewable resources, were common goods and thus belonged equally to all states. The developed states, on the other hand, considered these resources part of the freedom of the seas, belonging to whichever state or entity puts in the work to harvest or extract them. These two positions were polar opposites of each other, although eventually a compromise was reached for UNCLOS.[2] The compromise, however, was not ideal for any of the countries, and it became a major issue for the United States especially. This issue has been identified as being the reason provided for the United States' refusal to sign and ratify UNCLOS.

This dichotomy has been carried over to the BBNJ negotiations as well, as it was not possible to solve it during the PrepComs. The final report from the ten years of preparations for the Intergovernmental Conferences (IGC) to negotiate a treaty stated this specifically, stating, "*With regard to the common heritage of mankind and the freedom of the high seas, further discussions are required*." Leaving this door open left a heavy contentious topic open for discussions during the first meeting of the IGC in September of 2018. Though the discussions were vocal at this first meeting, surprisingly, the topic discussion died down during IGC2. In one interview with a representative from a developed country, it was emphasized that this door could not be opened during the negotiations anymore because it would essentially open the door to having to having to renegotiate UNCLOS as well—given that CHM is clearly defined therein and not open to interpretation, in their opinion. Korea specified this also in its intervention during ICG2 on the discussion topic of Scope, that it was important not to, "…*undermine existing UNCLOS regime which provides for CHM being applied to the seabed Area and its mineral resources only, not to ABNJ where the Freedom of the High Seas applies*…" Myanmar, however, emphasized during the same ICG2 that they

wanted to, "*Underscore need to respect UNCLOS—specially freedom of navigation and CHM—these are international principles that should be recognized.*" Nepal also voiced support for CHM, as did Philippines when they stated that, "*Common Heritage of Mankind must underpin the new regime governing MGRs of ABNJ…*" The Russian Federation, however, referring back to the concept of CHM, emphasized their view that benefit sharing would have to be strictly voluntary and non-monetary, stating that any kind of mandatory and monetary benefit sharing of MGRs would undermine UNCLOS, which is specific about the limitations of the concept of CHM. These schisms of discussions largely centered on highly developed maritime nations negating the CHM concept in the context of MGRs, and developing nations wanting to bring it in.

During the second round of negotiations, however, the discussion instead moved more towards capacity building, benefit sharing and transfer of marine technology, and whether this would be monetary vs. non-monetary, and mandatory vs. voluntary. Delegates once more largely fell into traditional categories of developed vs. developing states, with the Russian Federation and the U.S. landing strongly on both voluntary and non-monetary options. In one of the interventions on benefit sharing during IGC2, Norway in turn stated that any kind of benefit sharing that would arise from utilization and use of MGRs that hinted at profit sharing would not correspond to their way of thinking about the issue. For Norway, the delegate said, the target of benefit sharing could include the inclusion of developing countries on research cruises, emphasizing that most nations at this time do not actually utilize MGRs from the high seas, having enough work concentrating on land and in national waters. The U.S. delegate also emphasized their position on funding, stating that it needed to be "voluntary across the board" and clarified that the U.S. delegation did not consider it the role of the BBNJ instrument to change the international economic order. In terms of benefit sharing and transfer of marine technology, the U.S. stated it would not agree to anything that was not voluntary. Korea echoed this, stating during IGC2 that for their delegation, the issue of benefit sharing should be non-monetary only, and on a voluntary basis.

The Pacific Small Island Developing States, which had in the first round of negotiations placed more emphasis on CHM, appeared instead to move more towards the concept of "adjacency"[3] during the IGC2. This included transboundary effects as well as area-based management tools (ABMT), and in turn the requirements of environmental impact assessments (EIAs),

which at this point appeared to have become an issue that would be instrumental to their acceptance of a final agreement. This discussion was much more in focus for many others as well during IGC2, with delegates disagreeing on when EIAs would be necessary, who would perform them (states, sectors, other regimes), and to what degree adjacency could be a requirement or if the lines were drawn precisely at 200 nm and the edge of the EEZ. The cumulative effects of different stressors were another issue that came up as being important, especially to the PSIDS.

This group was also consistent in continuously bringing up the issue of climate change, ocean acidification, and even marine plastics, as well as species extinction during their interventions. These issues were debated much more during the IGC though, and by more nations at that time. However, during an interview, one of the respondents referred to the delegate from Palau who, when speaking as Chair of the section on capacity building and technology transfer, emphasized that the delegates must not forget that this treaty negotiation first and foremost was about protecting *biodiversity*.

The concept of adjacency was one that other developed coastal states also found important, though, particularly the Russian Federation, though in a different framework, namely how it would affect the economic activity of the coastal state in question. They specifically mention during IGC2 the designation of MPAs in this context, and how the creation of one in an area that borders with a coastal state should require the agreement of that state. This is because the provisions of a given MPA could for example include a ban on an economic activity such as fishing or shipping in that area, which could further restrict the activities in the zone of the coastal state.

What Elements must be Included for an Agreement to be Effective?

This question about biodiversity will become even more important when, after the treaty has been implemented, an assessment of its effectiveness will be issued. What will be required for the BBNJ treaty to be considered effective? An effective regime will for some require that the environmental challenges that are being discussed are solved within a designated timeframe. This argument would require that the environment in question be improved in tangible ways, such as protecting biodiversity in areas beyond national jurisdiction. One may also consider regime effectiveness from a legal

perspective, where the question focuses on whether environmental issues have been solved within the statutory framework of the given regime as well as international law, and whether member nations and the corporations and individuals that they represent have complied with the governance mechanisms they committed to upon ratification of the agreement.

As such, the effectiveness of the final ratified BBNJ treaty will depend on the ambition level of the BBNJ treaty, how sharp the enforcement teeth will be, and what concessions various actors will be able to swallow. Some states, primarily developing nations, emphasize the need for a strong and clear treaty with sharp teeth that is not a "*Paper Tiger*"—"One that is outwardly powerful and dangerous but inwardly weak and ineffectual" (Mao 1964); as they referred to the draft several times during the first round of negotiations. Other states, primarily developed states that have the capacity to invest in technology development and vessel modernization and refurbishing for resource extraction in areas far from their home states, emphasize less coercion and refer to the existing regulatory bodies that are in place in these areas and the need to remember the doctrine of the freedom of the sea. This was exemplified by the Russian Federation, which stated during IGC2 that, as far as monitoring of MPAs of the High Seas, this would be impractical. They noted that the global fishing industry utilizes substantial resources to patrol and use aviation to monitor fishing —and they still are not 100 percent effective. The Russian representative emphasized that it was a serious issue, but that there was a need to be pragmatic and realistic and that a creation of a global network for monitoring in the high seas was not possible.

One could argue that a weak treaty could be more likely to be effective from a legal perspective, as it would include fewer obligations and mandatory elements than a strong treaty. A strong treaty, however, which at least on paper would be well suited to protect the biodiversity in these areas, would require substantial resources to provide monitoring and compliance in areas that are far from shore.

What is the Outlook for Arriving at a Binding Instrument for BBNJ?

Finding common ground with respect to these aforementioned issues is instrumental for the arrival at consensus by the end of the scheduled two-

year negotiation process for the BBNJ treaty. What level of detail and how sharp should the teeth be in this treaty? Is the end goal consensus and ratification, or a treaty that has actionable compliance and enforcement mechanisms? Are these mutually exclusive, as some of the narratives during the negotiations may suggest? One way in which negotiators attempted to solve these thorny questions was through discussions about the form of the institutional arrangements of the treaty itself, and whether form follows function or the other way around. For example, what is the role of the global institution versus those that already exist? To what degree is the credo, "do not undermine," which was recognized in resolution 69/292 with reference to relevant existing legal instruments and frameworks and relevant global, regional, and sectoral bodies in the high seas, a fundamental principle? Scanlon (2017) in this context says that "…*rather than seeking simply to "not undermine" existing architecture in ABNJ, focusing on and facilitating their efforts and abilities to take action and to adapt to improve environmental protections would be highly beneficial*." In other words, it might be best to work to foster participation and inclusiveness of these existing organizations that already operate and draw on their expertise—rather than trying to reinvent the wheel from a top-down perspective.

New Zealand suggested a solution between PrepComs 2 and 3 that focused on a hybrid form. In their proposal, standards and obligations could be agreed upon at a global level that could then be implemented by states, especially in the case of ABMTs and MPAs, using regional and sectoral frameworks that already exist. This way, there would be a public-private partnership for the protection of biodiversity in the ocean, rather than a top-down approach. Rather than prescribing action that states must take, the ILBI would instead guide its actions through the state's existing participation in other forums for ocean governance that bears relevance to the issues related to biodiversity protection on the high seas.

The Icelandic delegate contemplated on the oft-repeated sentence by delegates of "*form follows function*" during the IGC2, when discussing the institutional arrangements of the final agreement. Many delegates did not want to discuss many of these issues before all the content of the packages had been discussed and been agreed upon, so that the function of the treaty was known. In his opinion, however, this was more valid if you were building a house than if you were negotiating an ILBI. He considered the negotiations as more of a journey, where you want to reach a destination and you start following the road towards this goal. "*If you don't know where to go, you*

Table III.1 Comparison of different institutional arrangements

Institutional arrangements of ILBI[4]	"Fit to purpose"; cost effective and efficient.	Promote transparency and accountability	Foster participation and inclusiveness
Global decision-making body only	Top-down, costly, difficult to implement.	Possible to promote. Examples from CCAMLR show difficulty because of distance.	Possible.
Regional and/or Sectoral approaches (status quo)	Proven inefficient; Crowded regulatory space with a patchwork of frameworks. Areas with no governance.	Not streamlined and different from country and regions alike.	Possible, but uncoordinated.
Hybrid approach	Global body with high- level decision making. Use existing institutions as much as possible; establishing new governance bodies when necessary.	States would have to report to COP on individual activities (incl regional and sectoral).	Open meetings up to non-contracting parties, NGOs and other stakeholders as observers to the proceedings.

Note: Hybrid approach was suggested as a compromise by New Zealand between PrepCom2 and 3. It was first discussed primarily in the context of ABMTs during PrepCom3.

wander," he said, and emphasized that when negotiating an agreement such as the BBNJ, you should in fact not let the form follow the function, but let the functions follow the form instead. In the opinion of the Icelandic delegate, if the form of the BBNJ agreement is a light agreement in terms of function and economic burdens that builds on existing bodies and expertise, it is easy to see that only core functions will be entrusted to the global level of governance, whereas the regional and sectoral levels will bear the bulk of the work. The opposite, he said, is an agreement on a global BBNJ agreement that has an overhead that is big and expensive, with overlapping and duplicate functions, and a global level governance that is endowed with extensive or comprehensive decision-making power.

Will there be consensus for a final agreement with all the required details that necessitates an effective agreement by spring of 2020 at the end of the fourth round of negotiations? During interviews with delegates and participants in ICG2, there was a divergence of views, with most leaning towards believing it will take longer—even much longer—than that to complete. One respondent noted that in their opinion, there had been no changes in positions at all since the first preparatory committee meeting (PrepCom1), and that if there was to be any movement at all, it would have to happen behind closed doors. "The building blocks are still unsolved; this

will be a lengthy process," the interviewee said.

The fear of one country effectively vetoing the process, however, did not seem to worry delegates. Even if there were to be countries that were unwilling to sign the agreement and consensus couldn't be reached, there would be provisions in place for a large majority ruling in that case, they said. One interview stated dryly that, "If 98 percent of the world wants a treaty, there will be a treaty." Another interviewee, in conclusion, when discussing the prospect of moving forward with the treaty, stated that "… we are talking the talk, we need to walk the walk now…"

On June 25th 2019, two months before the third session is scheduled to start, a first draft text of the final agreement was distributed to the delegates and the NGOs. This moved the negotiations to the next stage, which took place at ICG3 in August 2019. Though many delegates appear unconvinced that there is a high likelihood of a final treaty by IGC4 in spring of 2020, the chance for this may have increased substantially with this draft treaty.

Notes

1. Arvid Pardo of Malta discussed the need for the United Nations to take the lead in creating a new ocean regime in 1967, citing the need to manage the seabed, the "Area", in particular and calling for it to be considered the "*common heritage of mankind*" (Gorove 1971). The United Nations formally affirmed the status of the deep seabed beyond national jurisdiction in 1970, referring to the Area, as the "common heritage of mankind", and requiring the creation of a central institution to manage it, namely Part XI: The Area (UNGA 1970).
2. The text called for the creation of the International Seabed Authority (ISA) to regulate deep sea mining, with a mandate is to "*organize and control activities in the Area, particularly with a view to administering the resources of the Area*" (Article 157). The ISA was also tasked with issuing permits for any entity, state or private, that wishes to engage in deep sea mining. The mining entity would have to survey two identical tracts of seabed and present their results to the ISA after which they would select and approve one of the two tracts. The second tract was to be kept for the "Enterprise," an ISA-created and led commercial entity. This company will then redistribute the profits from mining this second tract in the CHM. Since there still is no ISA-authorized mining that has taken place, the Enterprise does not currently exist in any meaningful form.
3. Papa New Guinea explained this well during IGC2, stating that "adjacency"

refers to geographic or spatial proximity and the recognition of the special interests of coastal states in adjacent high seas areas in relation to the overarching obligations of UNCLOS to protect and preserve marine environmental and resources. The special interest of coastal states that are adjacent to a given activity arises from ecological oceanographic and cultural connectivity and problems of ocean space are closely interrelated and needs to be considered as a whole. As such, adjacency in the BBNJ context refers to an activity at sea that is going to take place in an area that may be outside the national jurisdiction of a given coastal state, but is happening adjacent to this.

4. Countries that supported the Global top-down approach in the context of PrepCom3 and ABMTs were African Group, EU, Mexico, El Salvador, Iran, Argentina, Pakistan, Costa Rica, Peru, Indonesia and IUCN. Those that supported the regional and/or sectoral approach were Iceland, Russian Federation and the International Commission for the Conservation of Atlantic Tunas (ICCAT); and those that supported the hybrid approach were Norway, New Zealand, Australia, Japan, PSIDS, and Federated States of Micronesia (FSM) (Kraabel 2018).

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The CAO Fisheries Agreement and the Role of Science: A Perspective from an NPAC fellow

Jihoon Jeong

Introduction

Climate change has caused a rapid retreat of Arctic sea ice in recent years, resulting in new areas of open water in the Central Arctic Ocean (CAO) that can be accessed by fishing vessels. However, scientific knowledge of the marine ecosystems in the new high sea areas is not sufficient to determine if commercial fishing is feasible and how to manage any potential CAO fishery in a sustainable manner.

That observation provided the rationale for the Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean ("the Agreement") signed on 3 October 2018, which aims to create a legally binding framework that will temporarily prevent unregulated commercial fishing in the high-seas portion of the CAO. The Agreement is regarded as a new cornerstone in Arctic maritime governance and conservation, as it applies a precautionary approach while engaging the five Arctic coastal states plus China, the EU, Iceland, Japan and the Republic of Korea ("5+5").

This paper focuses on the role of science in actively supporting the initiation and progress in the intergovernmental negotiation process for the Agreement. Some recent developments since the signing of the Agreement will also be mentioned. This paper then elaborates on the challenges that the Signatories of the Agreement face in preparing for its implementation, arguing for sustained science leadership to overcome these challenges.

The Development of the CAOF Agreement and the Role of Science

The CAOF Agreement was the result of a total of six sessions of intergovernmental negotiations that started in December 2015.[1] The Parties agreed on the text of the Agreement on 30 November 2017. With the main idea stipulated in the Oslo Declaration of 2015, the Declaration Concerning the Prevention of Unregulated High Seas Fishing in the Central

Arctic Ocean, the CAOF Agreement is the first legally binding agreement between a broader group of states that have both interest and capability to fish in the CAO ("5+5").

In the process towards the CAOF Agreement, science provided an initial and continuing impetus for the Parties to reach an agreement in a relatively short time period. The sharing of scientific analysis fostered awareness of potential fisheries issues in the Central Arctic Ocean (CAO), and provided relevant information to the intergovernmental meetings via a parallel science process, both prior to and during the sessions for intergovernmental negotiation.

First, there have been numerous scientific reports detailing how the Arctic sea ice is diminishing in its extent, thickness and geographical distribution (most recently, for example, NSIDC 2018). These led to concerns about the possibility of an unregulated commercial fishing in the new high seas that might irrevocably damage the marine ecosystem in the CAO. In April 2012, when Montreal, Canada hosted "the International Polar Year (IPY) Conference: From Knowledge to Acton," more than 2,000 scientists from 67 countries collectively signed an open letter to the leaders of the Arctic countries, requesting action to prevent yet another failure in marine ecosystem management (Arctic Ocean International project 2012).

The open letter received substantial attention from both academia and governments, amid growing concerns worldwide about the diminishing extent of Arctic summer sea ice—the lowest on record in the same year, in particular. The letter served as a significant driver in promoting actions on the governmental level, as one of the key figures involved in the overall CAOF negotiation recalls (Harrison et al. 2019, forthcoming).

Second, the governmental-level discussion and negotiation process for the CAOF Agreement could proceed with support from the science community. The meetings of the Scientific Experts on Fish Stocks in the Central Arctic Ocean (FiSCAO) were probably the most significant contributor. With a majority of scientists coming from the participating Parties in the CAOF negotiations, FiSCAO integrated the updated information and scientific advice, and reported these findings to the intergovernmental gatherings.

As the table below describes, the Terms of Reference (ToR) were created by intertwining responsibilities that emerged from governmental-level meetings and a parallel scientific process (FiSCAO). The intergovernmental negotiation sessions could concentrate on further deliberations in order

Table III.2 Working relations between CAOF governmental negotiations and FiSCAO meetings

Government-level meetings and negotiations	FiSCAO meeting related	FiSCAO outcome*
22 June 2010, Oslo Norway (1st Arctic 5 meeting on CAOF issues)	15-17 June 2011, Anchorage, Alaska (1st FiSCAO gathering)	Status and information gaps reports, inventory of research and monitoring, draft framework for Joint Program of Scientific Research and Monitoring (JPSRM)
29 April-1 May 2013, Washington, D.C., USA	28-31 October 2013, Tromso, Norway (2nd FiSCAO)	
24-26 February 2014, Nuuk, Greenland (Agreement on the text of the Oslo Declaration; ToR issued for 3rd FiSCAO)	14-16 April 2015, Seattle, Washington (3rd FiSCAO)	
16 July 2015, Oslo, Norway (Oslo Declaration signed)		
1-3 December 2015, Washington, D.C., USA (First "5+5" negotiation; ToR for 4th FiSCAO introduced)	26-28 September 2016, Tromso, Norway (4th FiSCAO)	Synthesis of knowledge, Science and Monitoring plan, framework for JPSRM plan
19-21 April 2016, Washington, D.C., USA		
6-8 July 2016, Iqaluit, Canada		
29 November-1 December 2016, Tórshavn, Faroe Islands (ToR for 5th FiSCAO presented)	24-26 October 2017, Ottawa, Canada (5th FiSCAO)	Scalable JPSRM and draft data collection, sharing and hosting guidelines
15-18 March 2017, Reykjavík, Iceland		
28-30 November 2017, Washington, D.C., USA (Concluded negotiations for the CAOF Agreement)		

* the FiSCAO Outcome column was quoted from Dupuis (2019)

to make progress in the discussions and mediations, based on the current scientific understanding relevant to each session generated by the FiSCAO.

The process that culminated with the CAOF Agreement constitutes a good example of a successful policy-science connection. Scientific expertise assisted the Parties in initiating and advancing inter-governmental negotiations, by providing a common ground of understanding in an open and bottom-up manner. The role of science was vital, in the form of expert meetings in parallel with governmental negotiations, to support the Parties in maintaining the necessary scientific rationale. The FiSCAO not only assisted government-level discussions that delivered the Oslo Declaration by the Arctic 5 states, but also contributed to the "5+5" format negotiations, providing the status of current science and informing future needs of knowledge, for the Parties to arrive at the Agreement.

Recent Developments for Implementing the CAO Fisheries Agreement

Recent developments after the signing of the CAOF Agreement in October 2018 in Ilulissat, Greenland, include the following:

1) On 12-13 April, 2019, Russia hosted "the Scientific Researchers' Conference of Participating Countries about 'The Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean'" in Arkhangelsk. Even though the conference was separate, with no formal connection to the CAOF Agreement or its follow-up process in the governmental level, participation of responsible officials from Russia and the U.S. was reported. In addition, the chair's statement, which was released after the roundtable session, was later briefed and acknowledged at the May 2019 Ottawa Preparatory meeting. Key recommendations from the chair's statement are as follows:

- The Parties will establish a scientific coordinating body or committee at the Ottawa Preparatory meeting
- Task the scientific body or committee to develop the Joint Program of Scientific Research and Monitoring (JPSRM)
- Develop a process to include local and Indigenous Knowledge into the JPSRM, and to involve Arctic residents (Indigenous Peoples in particular) in the work of the science group.

2) On 8-10 May 2019, the 4th Meeting of the joint ICES/PICES/PAME Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean (WGICA) took place in Hokkaido, Japan. The participants reviewed the draft of the WGICA report, which provides basic information on climate, geo- and oceanography, and the ecosystem in the CAO, and is expected to be published in November 2019.

3) On 29-30 May 2019, the First Preparatory Meeting of the Signatories to the Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean was hosted by Canada in Ottawa. It was shared that Russia (29 January 2019), the EU (4 March 2019) and Canada (29 May 2019) respectively ratified the CAOF Agreement, with other Parties anticipated that they would follow suit in the near future. Delegations agreed to hold a workshop in Fall 2019 in Canada to discuss ways to ensure inclusion of the Arctic Indigenous and local knowledge into the science that is relevant to the CAOF Agreement, and of the Arctic residents (Indigenous Peoples in particular) into decision-making process based on

the Agreement.[2] As the Parties were in unison in operating a Provisional Scientific Coordinating Group (PSCG), the EU will host the gathering in February 2020 in Ispra, Italy.[3] The outcomes from the two meetings will be reviewed in the next Preparatory Conference of the Parties in mid-2020.

Challenges prior to Entry into Force

The May 2019 Ottawa Meeting witnessed that three Parties already completed ratification or legally equivalent procedures. The U.S. (17 August 2019) and the Republic of Korea (22 October 2019) reported that they followed suit.[4] This supported some views that the CAOF Agreement might enter into effect in the not-too-distant future. The CAOF Agreement will enter into force once all 10 signatories ratify it.

Although science successfully supported the Parties in reaching the signed Agreement, it will still be a different kind of challenge for science to assist the implementation of the Agreement as it enters into effect, as well as in preparing necessary milestones before all the Parties ratify the Agreement. Whereas in reaching the signed agreement, the Parties concentrated on "what" and "why" questions, now the 10 Signatories are trying to come up with answers to "how" questions, which will entail more extensive discussion.

The following includes a list of issues at the core of CAOF Agreement that might affect successful implementation of the Agreement, and therefore deserves special attention:

Indigenous/Local knowledge and participation in practice of the CAOF Agreement

The CAOF Agreement fully acknowledges the importance of Indigenous and local knowledge in fisheries conservation and management in the high seas of the CAO. In addition to its preamble, Article 4 paragraph 4 and Article 5 paragraph 1(b) state the JPSRM will take into account relevant scientific technical works including Indigenous and local knowledge. The Article 5 paragraph 2 enables for the representatives of Arctic communities, including Indigenous Peoples, to participate in the scientific committees or their equivalents (see Schatz 2019).

However, outstanding questions remain: "What is the kind of

Indigenous/local knowledge that could be incorporated in forming the scientific bases for the CAOF Agreement?" "How is Indigenous/local participation incorporated into the decision-making process of the CAOF Agreement?" Intensive discussions took place during the May 2019 Ottawa Meeting that reflected on these questions, but ended without a tangible conclusion – except to agree that Canada would host a separate gathering dedicated to this matter. This issue requires special attention from the interested "+5" non-Arctic countries (especially, China, Japan, and the Republic of Korea) that have had much less experience and contact with local/Indigenous communities in the Arctic.

Operating the Provisional Scientific Coordinating Group (PSCG) (and its successor bodies)

One of the agenda items for the May 2019 Ottawa Meeting was "consideration of establishment of a scientific coordinating body or committee." After in-depth discussions for two full days of the meeting, the Parties agreed to establish a Provisional Scientific Coordinating Group (PSCG) with an emphasis on its interim basis. This is in line with the efforts to build on the work conducted by FiSCAO and "with the understanding that a more formal body will be established when the Agreement enters into force […] subject to any further guidance from the Meetings for the Parties."

With the Provisional Terms of Reference (PToR), the Parties gave the PSCG an extensive mandate that includes developing the Joint Program of Scientific Research and Monitoring (JPSRM), establishing mapping indicators and data sharing protocol, and identifying the processes to incorporate Indigenous and local knowledge by ensuring Arctic community representatives are included in the work of the PSCG.

Further efforts and sustained policy interest are required for the Parties to sustain the PSCG to be substantial in its first session in Ispra, Italy scheduled for February 2020, which is not too far from now. The PSCG is expected to combine all relevant scientific knowledge available, and to tailor the survey planning in a synergetic way. To that end, there should be ensuring participation of the relevant experts from all of the Parties and international scientific projects and other initiatives (e.g. WGICA, MOSAiC, SAS, etc), which in turn will enable substantial discussion and science-based decisions that can be agreed upon by the Parties.

Concluding Remarks

The CAOF Agreement, signed by the 10 Parties that included Arctic and non-Arctic governments and which will be entered into force soon, has certainly set a novel precedent with both the "precautionary principle" and an "ecosystem approach" embedded in it. The agreement adopted a step-wise approach that places an immediate and temporal restriction against commercial fishing, as well as a path to a science-based management scheme if sustainable fisheries do emerge.

Science exerted an important role in the initiation and development of the Agreement. More than 2,000 scientists called for policy action on the CAO fisheries issue in an open letter that received significant attention by decision makers that later resulted in inter-governmental negotiations for the Agreement. A scientific experts group (FiSCAO) supported the Parties with relevant scientific knowledge as requested, saving time and efforts in discussion.

The Signatories agreed to create a special role for collaborative scientific research to support the aims of the Agreement with an explicit request to develop joint programs. There are ongoing initiatives and field projects that are relevant to the CAOF Agreement, and Arctic local/Indigenous knowledge in place that could be accumulated in a more systematic fashion. A dedicated and sustained scientific leadership within the Agreement is warranted and justified, in order to better coordinate the survey planning and to digest collective information and ultimately to manage future fishing in the CAO sustainably. The PSCG that is now proposed will need to assume such leadership roles for the time being.

Notes

1. Negotiation meetings for the CAOF Agreement took place in 1-3 December 2015 (Washington D.C., U.S.A.), 19-21 April 2016 (Washington D.C.), 6-8 July 2016 (Iqaluit, Canada), 29 November-1 December 2016 (Faroe Island, Kingdom of Denmark), 15-18 March 2017 (Reykjavik, Iceland), and 28-30 November 2017 (Washington D.C.).
2. It is announced that the 'Workshop on the Co-Development of Indigenous Knowledge and Science for the Central Arctic Ocean Agreement' will be held in Yellowknife, Northwest Territories, Canada, on 13-14 November 2019.
3. In follow-up e-mail communication, the EU confirmed the date of the first PSCG meeting as 11-13 February 2020.
4. The United States officialized its ratification of the CAOF Agreement on 27 August 2019, rendering itself the fourth Party completing the ratification process. https://www.state.gov/the-united-states-ratifies-central-arctic-ocean-fisheries-agreement/(accessedon27September2019).TheRepublicofKoreaalsoreportedthatitcompleteddomesticratificationprocedureon22October2019.http://www.mofa.go.kr/eng/brd/m_5676/view.do?seq=320797(accessedon6November2019).

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The Role of the Polar Code in Arctic Maritime Governance

Rob Hindley

Introduction to the Polar Code

What is the Polar Code?

The International Code for Ships Operating in Polar Waters, or Polar Code (IMO 2015), is an additional set of requirements to the existing International Maritime Organization (IMO) conventions that address the additional hazards to ships of operating in Polar waters and the additional sensitivity of the Polar environment. The principle additional hazards include low temperatures, sea ice, remoteness, and high latitude. The Polar Code is implemented through a set of amendments to three IMO Conventions: the SOLAS Convention (addressing ship safety); the MARPOL Convention (addressing the prevention of pollutions from ships); and the STCW Convention (which deals with crew training).

Applicability of the Polar Code

The Polar Code applies to ships operating in Polar waters. The Polar Code is implemented through amendments to existing conventions, which have different applicability requirements themselves. The applicability of the safety part of the Polar Code (Part I), and the environmental protection part (Part II) are different (see Table III.3). It should be noted that SOLAS,

Table III.3 Polar Code applicability

Polar Code part	Applicability	Entry into force date
Part I-A	Ships operating in Polar Waters that are certified under SOLAS. *Note: SOLAS applies to all cargo ships over 500 GRT and all passenger ships over 100 GRT trading on international voyages*	Applicable to new ships keel laid after 1st January 2017 AND existing ships (existing ships are exempt from structural requirements) from first intermediate/renewal SOLAS SAFCON survey after 1st January 2018
Part II-A	All ships operating in Polar Waters	1st January 2017 (for new and existing ships)

and consequently the Polar Code, does not apply to fishing vessels, or to the majority of pleasure yachts, both of which are having an increased presence in Polar waters.

Key Provisions of the Polar Code

General scope of the Code

The Polar Code is divided into four parts in addition to an introduction that outlines the hazards considered in the Code's development. Part I-A provides requirements for the ships' safety. Part II-A includes mandatory requirements for environmental protection. The requirements of Part II-A are prescriptive. This means there are specific requirements that must be complied with, and compliance can be verified. This approach is typical of the majority of international safety requirements/rules for ships. Part I-A is formed around the IMO's goal-based standards framework. Consequently, provisions in Part I-A are developed with overall safety goals in mind, including clearly enumerated functional requirements and complementary regulations. While this approach provides a significant amount of flexibility to the designer and the ship operator, it creates new challenges with respect to verification and consistency when applying the Code across the world fleet.

Goal-based standards (GBS)

One of the fundamental elements of the Polar Code is that it is one of the first to follow a "goal-based standards" (GBS) format. The principal of GBS is that the IMO should focus on setting high-level goals and accompanying functional requirements, but it should be left to other competent bodies to develop the means to meet the functional requirements (either through complementary prescriptive rules, or other, usually risk-based, means) (Huss 2007). With respect to Figure III.2 (IMO 2004) Tier I *Goals* and Tier II *Functional Requirements* are included in each Polar Code chapter. These are supplemented by Regulations (Tier IV) in the Code.

The operational assessment

During development of the Polar Code it was recognized that the

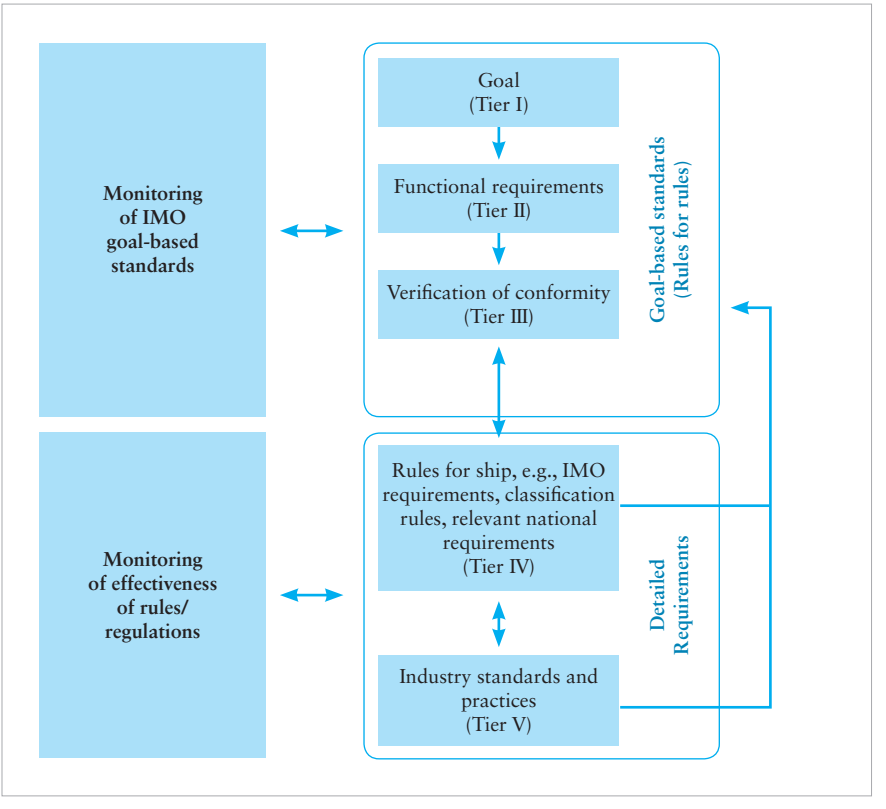

Figure III.2 IMO goal-based standards framework (IMO, 2004)

variability and diversity of climatic conditions in the Polar regions meant that there could not be a "one size fits all" approach. The environmental conditions for the specific expected operating area determine the scope of requirements. These conditions have a significant impact on the functionality requirements for the ship and its systems, with more onerous conditions leading to a higher specification for the ship; this essentially "limits" the ship. Operational limitations for ice conditions, low temperatures, and high latitudes are determined as a result of an Operational Assessment and are included on the Polar Ship Certificate.

At the core of the Polar Code is the Operational Assessment (OA), which is intended to be an owner/operator-led assessment of the expected hazards for the area and season of the voyages the owner/operator intends to undertake, along with an evaluation of the mitigation measures implemented in the ship (either at the design stage or retrofitted) (Lloyd's

Register 2016). The Polar Code is not specific in terms of the format of the OA, although the most common approach taken to date for the OA is a structured "Hazard Identification" (HAZID) workshop. Operational mitigation measures are documented in the Polar Water Operational Manual (PWOM), which must be carried onboard.

Implementation Challenges for the Polar Code

The process

A number of challenges have arisen for implementation, principally because the Code has been one of the forerunners of a new approach by the IMO to draft regulation. A goal-based approach is a flexible tool, which allows regulation to be in place, but puts the onus on the owner/operator to evaluate the suitability of risk-mitigating measures in their anticipated operating environment. However, the goal-based approach is new to the maritime industry, and a number of stakeholders, in particular shipyards, are yet to adapt to the reality of a goal-based Code.

The goal-based nature of the Code also poses significant challenges with regards to compliance. The risk mitigation approaches adopted to meet the Code's requirements come from a ship-specific operational assessment, which may lead to ship-specific equipment requirements. In a prescriptive rule-based regime, checking compliance is straightforward. In a goal-based regime, verification cannot be through a standard checklist, as mitigation is ship specific. The challenge is that there is no mechanism in the Code to deal with this. Referring to the GBS framework in Figure III.2, it can be seen that the bridge between functional requirements and detailed requirements is the "Verification of Conformity" (Tier III). The Polar Code does not state clearly how conformity is to be verified. The original intention was that the *Regulations* that sit below the *Functional Requirements* in the Polar Code were supposed to prescribe a specific set of equipment/measures that meet the *Functional Requirements*. Thus, alternatives to the regulations could be verified for conformity against a standard or baseline. However, as can be seen from the Polar Code *Regulation* text, the requirements are in many cases not specific, containing the phrase "means to be provided." This leaves the regulatory bodies (both the national administrations and classification societies, who act on their behalf) with the task of evaluating the suitability

of different mitigation measures and means without a substantial baseline reference. The challenges of implementation and verification are therefore a result of the goal-based nature of the Code and the lack of a strong and clear set of Tier III/verification requirements. This should be recognised as an issue with all goal-based standards, and as the IMO continues to implement the framework, such issues are likely to be refined and redressed across the entire spectrum of maritime regulations. In the meantime, questions still exist regarding who is responsible for what, and where the responsibility for verification lies.

The status of the operational assessment

In order to establish limitations, the Polar Code working group at the IMO decided that an Operational Assessment should be carried out by the owner/operator. This immediately appears unusual—a ship owner undertaking their own assessment to determine operational limitations that will then be entered on their ship's certificate. However, in reality this is already the case during the ship specification process, where an owner will decide what ice class and what design temperature is right for the ship, based on the owner's needs. The challenge is that the *suitability* of the limitations for the expected operational envelope is not necessarily verified. For Operational Assessments today, it is the owner/operator who undertakes the work. This feeds into the PWOM content, both of which are usually submitted to the administration or classification society for review. However, the question is, "For review against what criteria?" There are no standard approaches in the Polar Code for what constitutes a complete OA or what level of risk is acceptable etc. This becomes further troublesome when combined with the loose "means to be provided" phrasing in some of the *Regulations*, which should be used as a benchmark reference.

Existing ships

For the majority of operators/owners already operating in the Polar regions, the process of Polar Code compliance usually commences with a gap analysis of the Code's more prescriptive requirements (the *Regulations*) that detail the equipment, systems, and operational procedures of the ship. Following this, a preliminary OA is undertaken to establish if, for the existing operational envelope, the current mitigation measures provided are

adequate. The most common challenge that arises from the assessment is that of the design temperature.

The Polar Code introduces a new definition for design temperature—the Polar Service Temperature (PST). This is defined as 10 degrees C. below the lowest mean daily low temperature (LMDLT) in the area of operation during the anticipated season of operation. The challenge is that existing ships, many of which have been successfully and safely operated in Polar waters for decades, do not have an assigned PST, or any documentation to demonstrate that the ship has been designed and approved to a specific low temperature. Furthermore, although the existing ship may have had a low "design temperature" specified during new construction voluntarily by the owner, there is typically no traceability or certification to prove that the equipment installed has been designed and tested for actual low temperatures. Although some national administrations societies and classification societies have taken a pragmatic approach to this issue—often allowing service experience in low temperature in lieu of testing requirements for existing non-safety essential equipment—there is a significant lack of consistency with regard to how best to approach this issue.

Consistency of application is a theme with respect to the challenges of implementing the Polar Code. This is even more the case for existing ships, where national administrations and classification societies are required to interpret and verify against a goal-based code without clear instructions on the actions to take. For the majority of existing prescriptive rules, as has been discussed, specific line items in the regulatory text can be used to cross-reference a checklist to ensure conformity. While the Polar Code does contain elements of these line items in the *Regulations*, key compliance items (for example provision of survival resources for extended survival in ice-covered waters) are a result of the ship-specific OA. A ship under survey for Polar Code adherence therefore does not have a straightforward means of demonstrating to the attending surveyor that it complies. This challenge is likely to resolve as flag states and classification societies incrementally move to a consistent verification/survey regime, where best-practice approaches are adopted. For example, to solve the issue of verification against a goal-based Code, Lloyd's Register, one of the classification societies, has introduced a Supplement to the Polar Ship Certificate, which is an official document created by the classification society to document what "means to be provided" measures have been adopted and approved: This creates a verification framework for the inspector onboard.

Conclusions: Strengthening the Polar Code

Harmonization of survey and approval processes

The Polar Code is the first mandatory international Code for ships operating in Polar waters. Given the diversity of the operating environment, and considering the variety of hazards (and the variety of their severity depending on the geographical location and season of operation) this is an achievement in itself. However, in order for the Code to be truly effective it needs to be implemented in a consistent way. To date there has been a limited amount of success in this area, with a number of divergent interpretations and approaches to verification made by national administrations and classification societies. To a certain extent this is to be expected for any new Code, especially one formed around a new regulatory "goal-based" approach. However, this new regulatory regime should have been considered with respect to the verification and approval process as part of the Code's development. There is a significant gap between the Tier II functional requirements and the Tier IV regulations, where verification has not been adequately addressed. In order to harmonize approaches for verification, a number of actions are proposed:

- Review and update of the *Regulations* in the Code, to ensure they provide a clear, prescriptive benchmark against which alternatives can be verified
- A Unified Interpretation (between classification societies and national administrations) on the format and status of operational assessment and PWOM and how this links in with provision of equipment, systems and procedures, including more guidance on the risk assessment tools to use
- Common/consistent recording of the outcomes of the goal-based approval process into a clear, surveyable format. Revision of the Polar Ship Certificate Record of Equipment to include how the ship has addressed the "means to be provided" requirements in the Code: The Lloyd's Register Polar Ship Certificate Supplement is a reasonable model to begin building a new, consistent format.
- Clarification of outstanding technical interpretations at the IMO.

Non-SOLAS ships (Polar Code Phase II)

Before the Polar Code was finalised it was acknowledged that follow-on work would be required, especially to address ships operating in Polar waters not subject to certification under SOLAS (so called "non-SOLAS ships"). In particular, fishing vessels and pleasure craft, which, especially for the Antarctic, make up a significant amount of maritime traffic and maritime incidents, were to be considered as part of Phase II of the Polar Code development. Discussions at the IMO remain ongoing, however the issue is not simple: The premise of the Polar Code is that it builds on, and does not repeat, the requirements already in SOLAS: If a ship is not required to comply with SOLAS, then simply modifying some parts of the Polar Code to suit these ship types will be ineffective, because the basis of the Code (SOLAS) is not there. Currently the IMO approach is:

- To encourage national administrations to implement the Code voluntarily to non-SOLAS ships (although the approach to doing this is not clear)
- To consider specific requirements in the Polar Code that could be implemented to non-SOLAS ships (e.g. Chapters 9 and 10 which deal with navigation and communication)

Although this piecemeal approach may be more practical in the short term, the longer-term solution would require either the relevant baseline requirements being extracted from SOLAS and inserted into the Polar Code to create a "stand alone" Code, or to build on Polar Code Annexes to existing conventions that deal with these non-SOLAS ships. For fishing vessels, this would involve developing a Polar Code Annex to the Torremolinos Convention (modified by the Cape Town Agreement) (IMO, 2012).

Enforcement of operational limitations

One of the drivers for the creation of the Polar Code was to provide clarity on the limitations for ships operating in Polar waters. National administrations, coastal states, and insurers are all stakeholders, along with the operators themselves, in ensuring transparency of control on ships operating in these areas. While the Polar Ship Certificate does have operational limitations stated on it, it is not clear to what extent these limitations will be enforced. Will they simply be an "after the fact"

means for insurers to establish that a ship incident occurred due to a ship operating outside of its limitations? Will coastal administrations use the limitations to detain ships where, in their opinion, the limitations would be exceeded at some future point, based on the expected voyage plan? With the widespread use of AIS (Automatic Identification System) for ship tracking, it is now far easier to track a ship's route and overlay the ice conditions and air temperature data to evaluate the ship's compliance. One future step could be for coastal states to use the Polar Code and its limitations to supplement existing national regulations for controlling operations in ice-infested parts of their their EEZ, as permitted through Article 234 of UNCLOS.

Fourth Tier regulations and standards

The goal-based approach of the Polar Code enables the IMO to focus on setting high-level requirements in terms of expected safety levels. The GBS framework expects that detailed regulations/requirements will be set, and maintained, by other bodies, (for example classification societies, the ISO, etc.) as part of Tier IV and Tier V (see Figure III.2). However, because of the sequence of the Polar Code's development the situation was, rather obviously, that the high-level goals and functional requirements are set by the IMO with the anticipation that industry and other bodies would step up to fill the gaps. This has happened in certain areas of the Code, while in other areas there has been a significant time lag between the finalisation of the Code and moves to develop lower tier regulations and standards. As such, in some cases, it is only after the Code went into effect that standards are becoming available. While the IMO has no control over the pace of such developments, one of the challenges that needs to be acknowledged is that a goal-based approach requires early engagement with stakeholders outside the IMO, in order for the groundwork to be laid for successful implementation in a timely manner. This should be a learning point for all future GBS regulatory development, as the Polar Code has served to be a testing ground for future regulations both within and outside the Polar regions.

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Challenges of Polar Code Implementation: Compliance and Enforcement

Piotr Graczyk

Introduction

The adoption of the mandatory International Code for Ships Operating in Polar Waters (Polar Code) by the International Maritime Organisation (IMO) in 2014/2015, and its entry into force on 1 January 2017, were important milestones in ensuring safe shipping in the Arctic. The effective implementation of the Polar Code requires interplay among various actors. Flag, coastal, and port states' maritime authorities, classification societies, insurers, and operators all play crucial roles. Although the Code entered into force relatively recently, the experience gathered so far has revealed several major challenges for effective implementation.

Even when the Code was originally adopted, various stakeholders anticipated that the Code's design might lead to possible challenges for effective implementation. Several issues were not covered by the Code at all, such as non-SOLAS vessels and a number of environmental questions. Being aware of these problems, in June 2017 the Arctic Council's Protection of the Arctic Marine Environment (PAME) Working Group had already established the Arctic Shipping Best Practice Information Forum (the Forum) to facilitate implementation of the Code. Effectuating implementation of the regulations depends on compliance (conforming to a rule), bolstered by a process of ensuring compliance, namely enforcement.

The primary purpose of this chapter is to give an overview of the issues related to the Polar Code's implementation. This effort is structured in two parts. First, it succinctly outlines the major challenges of effective Polar Code implementation, including both compliance and enforcement considerations. Second, it examines key obstacles for strengthening the Polar Code. The final section provides concluding remarks with suggestions for further research.

Major Implementation, Compliance and Enforcement Challenges of the Polar Code

Certain implementation challenges are inherent in the Polar Code's design (Mauger 2017; Deggim 2018). For example, supplemental safety and pollution-prevention measures were added on top of the already existing requirements of the SOLAS, MARPOL and STCW conventions. In addition, the Code adopts a functional goal- and risk-based approach, being the first IMO instrument to follow a three-layer procedure of "goal," "functional requirements," and "regulations." The Code, therefore, works in a different manner than most of the previous IMO safety regulations, which are prescriptive and include listing specifications (e.g. of safety equipment) to be used under defined conditions, and are more straightforward for ensuring compliance. By contrast, the Polar Code is based on guidance and examples. Since there are no guidelines for prescriptive measures that ensure compliance with functional requirements, and there are alternative ways to meet the goals and requirements, there is much room for interpretation. This vagueness places additional difficulties on ship operators, classification societies, and flag states.

The Polar Code identifies and lists the major hazards that may affect polar operations and their potential consequences, such as the lack of accurate charting, harshness of the environment, limitations of radio and satellite communications, heavy weather and ice damage, ice trapping and groundings, machinery failures, and insufficient emergency preparedness and SAR infrastructure. In accordance with this risk-based approach, each vessel entering polar waters needs to undergo a formal risk assessment and clearly state the specific vessel's capabilities and operational limitations, including information about where the ship will go, for how long, and what time of the year.

Ship operators are supposed to undertake a risk assessment, taking into account the hazards listed above, that will determine and guide their planned operations in polar waters as described in the Polar Waters Operational Manual (PWOM). Compliance is secured by approval by a flag state or a classification society on its behalf. This responsibility of a ship operator is further complicated by the use of vague phrases, such as "adequate" or "sufficient," which are to be determined by the ship operator or classification society and lead to non-uniform practices in the Code implementation. The process of preparing a vessel for operations in polar

waters and ensuring compliance with the Polar Code is complex and leaves some aspects open to interpretation (Fedi et al. 2018a, 62).

Under the circumstances, several entities have developed different tools and instruments to support implementation. This includes, for instance, Lloyd's Register Polar Code interactive tool, the Polar Code Advisory issued by the American Bureau of Shipping (ABS 2016), and the Polar Operational Limit Assessment Risk Indexing System (POLARIS), which was developed by IACS and the IMO as a single ice-regime system aimed to incorporate best practices and experiences from Canadian and Russian ice regimes. Furthermore, the IMO itself adopted an "interim guidance" (IMO 2016) in order to gain experience in the Code application in reference to methodologies for the assessment of operational limitations in ice. This guidance should be reviewed four years after the Code's entry into force, in order to make any necessary amendments based on experience gained. Also, some Arctic flag states and port states have formulated their guidance by interpreting aspects of the Code. This list is not exhaustive and the need for additional sector guidelines and instruments suggests that there is still considerable uncertainty and ambiguity related to implementation of the Polar Code.

Different interpretations by maritime authorities give rise to additional legal questions, such as different scopes of application of parts adopted through SOLAS and MARPOL (Part I-A / Part II-A), roles of coastal, flag and port states, including Port State Control, use of right of intervention with respect to vessels operating in areas beyond their capabilities, delegation of powers by the flag state to classification societies in certification, and coastal states' responsibility to provide necessary infrastructure. Flag state administrations may also set additional or special requirements for ships operating under their flag (DNV GL 2017a).

The main interpretation issues revolve around goal-based versus prescriptive requirements and regulations. They refer primarily to relationships among ship category, ice/polar class, ice conditions and POLARIS as a decision-support tool, crew training, requirements for life-saving appliances, and survivability.

The implementation difficulties pertaining to all these aspects, to a large extent, can be brought back to the human element. Based on experience gained to date through certification, operations, and science-based reports, the major challenges have been identified in the goal-based provisions concerning what is called a human element in the Polar Code: life-saving

equipment, training and manning, and burden on crew. Some challenges remain also with regard to the conduct of operational assessments, modelling of PWOM, POLARIS, and harmonised implementation though uniformed interpretations.

Compliance

Compliance with technical standards is an essential part of ensuring implementation of the Code. Nonetheless, the human dimension is the decisive aspect, as ultimately all depends on decisions taken on the spot. This may include whether to operate in a given type of ice, what type of life-saving appliances to choose, or whether evacuation or waiting for help is a better option (Salokannel et al. 2018). Defined by the IMO (2004) as "a complex multi-dimensional issue that affects maritime safety, security and marine environmental protection," the human element "involves the entire spectrum of human activities performed by ships crews, shore based management, regulatory bodies, recognised organisations, shipyards, legislators, and other relevant parties, all of whom need to cooperate to address human element issues effectively." The human element is, therefore, important not only on the vessel, but also at the meetings of international bodies concerned with shipping, classification societies, and other stakeholders that are not immediately present on the vessel.

Crew training requirements and certification are not stringent in the Code (Fedi et al. 2018, 68) and significant discretion has been left to ship owners/operators. It is stipulated that relevant courses, training, and certification shall be provided by the maritime education and training institutions (Karahalil and Özsoy 2018, 45), which are not uniform and not approved internationally (Arctic Council 2009, 68; Lloyd 2019). Yet another issue requiring additional attention concerns the so-called "one-time goers" to the Arctic waters—vessels engaging in a single (or occasional) voyage, who may not be willing to invest much in crew training and equipment.

The Polar Code obliges operators to provide life-saving equipment ensuring a minimum of five days survival time. This requirement puts additional strain on existing life-saving appliances (LSA). Three comprehensive and full-scale survival exercises assessed survivability under three scenarios: SARex Spitzbergen utilised normal SOLAS equipment

(Solberg et al. 2016); SARex2 utilised modified SOLAS equipment (Solberg et al. 2017); and SARex3 assessed survivability associated with onshore evacuation (Solberg and Gudmestad 2018). These exercises demonstrated that the Code's requirement of survival until rescue for a minimum of five days is hard to comply with, if not impossible. Survival equipment that meets these requirements does not readily exist.

Most stakeholders in the Code implementation process have identified challenges and gaps. On the ship operators' part, commonly encountered issues pertain to preparing Operational Assessments (OA) and PWOM, choosing suitable LSA, and identifying and gathering all necessary information for voyage planning. Some challenges, especially related to technical aspects of ensuring data accuracy, producing reliable information and its communication to mariners, were particularly acute at specialised institutions responsible for supplying relevant information, such as the World Meteorological Organisation or the International Hydrographic Organisation. Classification societies do not approve OAs and PWOMs, even though decisions made there are included in Polar Ship Certificates and determine compliance with the Code's provisions. Since the Code does not prescribe the conduct of OA, there are different understandings of how these assessments should be carried out and what should be included (Nash 2018). From this perspective, some ambiguities remain. These include ship categories and ice class (including class equivalency), definitions of ice conditions, stability requirements, survival equipment, definition of up-to-date information, actual training requirements, and compliance with STCW amendments (Mejlænder-Larsen 2018).

Enforcement

Implementing the Polar Code also depends on efficient enforcement. Since the IMO has no direct role in this regard, most of these tasks are dispersed among flag states (Flag State Control and classification societies acting on their behalf), coastal states (limited role) and port states, with specific potential for insurers to participate in this regard. In particular, the port state control (PSC—not to be confused with the Polar Ship Certificate) may be an effective instrument to ensure that ships planning to go to ice-infested waters comply with the Code's provisions.

Nonetheless, certain challenges exist here as well. Most relevant for the

Arctic are PSC inspections under the Paris MoU and Tokyo MoU on Port State Control. One challenge for PSC Officers (PSCO) is that during an initial inspection they are supposed to verify both Polar Ship Certificate and the PWOM. However, there is no guarantee that the PWOM is written in a language spoken by the PSCO, and there is no requirement that this critical document is intelligible to inspectors.

Furthermore, verifying if the vessel is properly manned by adequately qualified, trained, and certified crew in accordance with the Code is virtually impossible, for no uniform standards for training exists (Kuzmin 2019). Also, enforcement might be impeded in other ways. In a case where a Polar Ship Certificate is produced onboard, PSCO would still not be able to inspect compliance with technical, operational, and crew certification requirements that may pertain to the geographical location of the vessel and the destination of the next voyage. Although the Paris MoU Committee agreed that the Polar Code requirements apply regardless of the geographical limits of the Code (Paris MoU 2017, 16), other MoUs, such as the Tokyo MoU or Caribbean MoU, could adopt different approaches that may be inconsistent.

Some Arctic States undertook an initiative at the Paris MoU Committee to conduct a Concentrated Inspection Campaign (CIC) or Harmonized Verification Programme (HAVEP). This effort attempted to take into account how to regard the Polar Code after new convention regulations recently entered into force (Paris MoU 2017, 8). Even though the CIC on Polar Code was added to the Paris MoU list of potential topics, concerns emerged from non-Arctic states, including large flag states, that it may be premature to conduct CICs that are not relevant for half of the Paris MoU members. Under the circumstances, it was initially decided that a CIC on the Polar Code will not take place in the coming years. Instead, a Task Force on verification of the compliance with the Polar Code was be established with Danish lead. Eventually, the Paris MoU 52nd Committee Meeting that took place in St. Petersburg decided that an additional CIC focused on the Polar Code will be arranged in 2022.

Strengthening the Polar Code

Despite the implementation challenges, the Polar Code is a rather strong technical instrument that evolved into its current form over a span of about

25 years (see Brigham 2000; Jensen 2016). It demonstrates an outcome that was possible to achieve under the circumstances and taking into account the interests of more than 160 member states of the IMO. The Code applies to vessels that are covered by the parent conventions to which it was attached, namely SOLAS, MARPOL and STCW. This leaves many types of ships out of the Code's scope. In this context, strengthening of the Polar Code may be understood in three different ways:

First, revisions could focus on strengthening existing provisions, for instance by making stricter structural, equipment, or manning requirements. This would require a thorough and careful experience-driven analysis of the possible deficiencies as a first step. The above-outlined catalogue of implementation challenges is not to criticize the Code as inadequate. On the contrary, it seems that the Code is generally viewed by stakeholders as robust enough, yet needing more information, knowledge, experience, and cooperation to begin by implementing the existing provisions, followed by efforts to identify areas or specific regulations that need to be amended —and then perhaps to launch discussions about strengthening certain provisions. One issue area where improvements seem to be necessary and around which an emerging consensus is noticeable is the five-day requirement for life-saving equipment to ensure survivability.

A second understanding relates to adding the intentionally left-blank environmental provisions with regard to harmful substances carried by sea in packaged form (MARPOL Annex III), and regarding air pollution from ships (MARPOL Annex VI), neither of which are mentioned in the Polar Code. In general, Part II of the Code was more challenging to negotiate due to differences between flag and coastal states and between Arctic and Antarctic states, including diverging stances among the Arctic states. The number of divergent views is further demonstrated by the number of states that ratified MARPOL amendments dispersed throughout different Annexes (Jensen 2016, 75). Safety and environmental provisions were negotiated separately within two different IMO Committees—The Maritime Safety Committee (MSC) and The Marine Environment Protection Committee (MEPC). That is also a reason why potential strengthening would require precisely defined issues and ways to approach them.

Third, strengthening the Polar Code may be understood as initiating a Phase 2 that would extend its application to non-SOLAS vessels. As the Code's safety provisions were made mandatory through amendments to the SOLAS convention, the vessels not covered by that instrument—cargo ships

and passenger ships below 500 GT—are automatically not covered by the Code. The environmental part of the Code has a much broader applicability defined in relevant sections of MARPOL Annexes. The safety of smaller vessels in polar waters, especially fishing boats and pleasure craft, poses a significant issue that currently may be covered only by recommendations of IACS or national requirements (DNV GL 2017b, 11), which are not universal and difficult to enforce. The overarching problem with extending the applicability of the Code to these types of ships is that there are no IMO conventions in force in which the polar waters amendments could be embedded.

Initially, it was decided that Phase Two could be launched once enough experience is gained with the Code's application to SOLAS vessels. This position was restated by the 97th session of MSC (MSC 97) in 2016, before the Code's entry into force (Deggim 2018, 27). Nonetheless, at MSC 98, New Zealand had already proposed to launch Phase 2. This preliminary approach aimed to alleviate the challenge of an absent convention by developing a new part III of the Code that would be mandatory under the SOLAS Chapter XIV. Application of that chapter would be expanded to all ships operating in polar waters (IMO 2017). Notwithstanding limited support for the proposal to commence Phase 2 without a delay, the prevailing view among the states was that starting work at the moment would be premature, given the implementation issues and the lack of legal framework addressing the safety of non-SOLAS vessels.

Phase Two of the Polar Code, especially in reference to safety of fishing vessels, is inextricably connected to the entry into force of the 2012 Cape Town Agreement (CTA) related to the 1993 Torremolinos Protocol and the 1977 Torremolinos International Convention for the Safety of Fishing Vessels. The CTA would be the most pertinent instrument to be amended to include safety measures for fishing vessels operating in polar waters (IMO 2017).

Concluding Remarks

The Polar Code is an important example of an international preventive action to save lives and protect the environment in the polar regions. As with most international accords, the Code, despite its principally technical character, contains certain deficiencies that may stem from the concessions

made during multilateral negotiations and the lack of experience with a new type of instrument with goal-based requirements. A natural consequence is that any possible flaws are being revealed during the implementation, which also make it more challenging to execute. Goal-based requirements also mean that operators test the most cost-effective measures to comply that lead to discrepancies in implementation. Moving forward, the key is to cooperate on identifying, analysing and closing these gaps through inclusive and effective international mechanisms. Effectiveness of the Polar Code, as with any legal instrument, depends on its consistent implementation through uniform compliance and enforcement. The human factor seems to be pervading most of the implementation issues. Despite different tools being developed and utilised on the enforcement side, the final decisions regarding safety and compliance depend on qualified personnel making decisions in real time under sometimes challenging conditions. Further studies on how a broadly understood human element may affect the Polar Code implementation are needed.

Implementation of the Code involves many interests, including political and economic ones, and therefore solutions need to be based on an equilibrium acceptable to all parties. Collaboration is, therefore, crucial to ensure this balance can be found. Possible improvements or expansion of the Code is thus contingent on overcoming certain political obstacles. Utilising the existing cooperation vehicles, including IMO, Arctic Council/PAME, and the Forum efficiently may ensure finding the right balance, mechanisms and measures to facilitate the successful Code's implementation.

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PART IV

THE POLITICAL ECONOMY OF ARCTIC RESOURCE DEVELOPMENT AND MARITIME LOGISTICS: THE CASE OF YAMAL LNG

Arctic Resource Development: Economics and Politics

Tatiana Mitrova

Russia's leadership regards Arctic development as a key national priority. This is driven by several significant considerations. First and foremost, for security reasons: Keeping more than 20,000 kilometers of Russia's border in the Arctic region protected is a real security challenge for the country, and requires huge investments. As Russia's confrontation with the West has become more acute over the last five years, security and military goals are becoming a higher priority for the Russian state.

Second is a geopolitical agenda: Russian (and previously, Soviet) historical ambitions for having a strong position in Arctic are now augmented by increasing competition for influence and power in this region. This includes the Arctic Council members, but also countries with observer status, which includes the UK, Germany, France, Spain, Italy, Netherlands, China, South Korea, Japan, India, and Singapore. Russia has had controversial and not always friendly relationships with some of these countries. So protecting and expanding its leading role in Arctic is also an existential geopolitical task for Russia, which has faced increasing pressure and isolation from the West since 2014.

Last but not least, the Arctic is already playing a critical role in Russia's economic development, especially as a key region for hydrocarbon production. This sector generates about 15 percent of Russia's current GDP, and this share is projected to increase. Onshore hydrocarbon production in the Arctic zone provides the bulk of Russia's oil and gas supplies. The share of oil produced in the Arctic zone rose from 12 percent in 2007 up to 18 percent in 2017, and by 2035 it is projected to reach 26 percent. Natural gas production in the Arctic already constitutes 83 percent of total Russian gas production today.[1]

Successful economic development of the region is expected to help to solve both security and geopolitical issues by populating this area and providing clear economic incentives for geopolitical cooperation here. Social-economic development of the Arctic zone of the Russian Federation today is indeed positioned very high on the agenda of the authorities.

In fact, Russia has been planning large-scale development of Arctic

natural resources since the 1980s, including the Yamal mega-project and, later on, the Shtockman project and offshore oil exploration and production. But not all of these projects have been successful, given the changing market environment and lower hydrocarbon prices, as well as sanctions imposed on Russia. With the development of the North American shale revolution, Shtockman, which targeted the U.S. market for exports, turned out to be completely unattractive. Oil production in Arctic shallow waters (Prirazlomnoye), and even more so for deep-water production, has proven to be technologically difficult and economically unjustified when oil prices are at USD 60-70/bbl. At this price, successful production requires massive tax exemptions. At the same time, due to Western sanctions against Russia, deals signed by Rosneft with ExxonMobil, ENI and Statoil on Arctic offshore exploration were terminated. Arctic offshore hydrocarbon resource development was specifically targeted by the sanctions. Today, nearly every technology required for oil and gas production in the Arctic shelf is subject to the sanctions, and participation of Western companies has become impossible. There were some attempts to look for Chinese equipment, but it seems that Chinese companies do not have the proper technology available, and also appear to be unwilling to take serious risks to violate international sanctions. This has affected not only oil, but also Arctic coal production and export projects.

Actually, among all Arctic resource development initiatives, only gas projects in the Yamal Peninsula (with both pipeline gas development by Gazprom and Novatek's LNG projects) proved to be commercially viable. However, the success of Novatek's Yamal LNG has reinvigorated attention to the Northern Sea Route (NSR)[2] and demonstrated potential benefits of its large-scale development.

Recently (2016-2019) Russia's emphasis in the region was moved from hydrocarbon extraction to the NSR mega-project, which is supposed to include: 1) exports of Russian hydrocarbons by this maritime route; 2) eventually, development of container transit between Asia and Europe via this route and, as a result; 3) development of port facilities and supporting infrastructure along the length of the NSR, which would create jobs and revenues for the population in this area.

The NSR itself has a long history. Since the mid-1930s it has been an officially managed and administered shipping route along the northern coast of Russia. It is only recently, however, that the NSR became the State's priority mega-project. There are several reasons for its gaining momentum:

- With the "lower for longer" prices of oil and gas and sanctions (both technological and financial), previous plans of massive hydrocarbon development in the Russian Arctic seem to be less viable.
- Global warming and melting ice make maritime transportation in Arctic easier. In August 2017, the first ship traversed the Northern Sea Route without the use of icebreakers.[3] In 2018, the Maersk Line sent the new ice-class container ship *Venta Maersk* through the route to gather data on operational feasibility (though Maersk mentioned later that they do not currently see it as commercially attractive).[4,5] A 2016 report by the Copenhagen Business School found that large-scale trans-Arctic shipping will become economically viable by 2040.[6] Some studies even predict "remarkable shifts in trade flows between Asia and Europe, diversion of trade within Europe, heavy shipping traffic in the Arctic and a substantial drop in Suez traffic."[7] Russia wants to benefit from these developments, pulling trade flows from the Suez Canal to the NSR.

However, growing tensions and escalating trade wars between China and the U.S. are forcing Asian shippers to look for alternative routes. Moreover, for China in particular, the NSR is an important tool to enhance its presence in the Arctic and it is sometimes even presented as a part of China's "One Belt-One Road" initiative.

Given all these factors, Russia's leadership currently regards NSR as a national mega-project and puts significant efforts and expectations on it. In 2018 the government transferred the main responsibility for the NSR to Rosatom, which through its ROSATOMFLOT subsidiary manages the Russian nuclear-powered icebreaker fleet based in Murmansk.[8] And in 2019 a special deputy minister was appointed in the Ministry for the Development of the Russian Far East, responsible for the Arctic zone.

Currently the Ministry is working on the new Arctic strategy. The existing "Strategy for the Development of the Arctic Zone of the Russian Federation and National Security up to 2020" was developed in response to the "Basics of the State Policy of the Russian Federation in the Arctic for the Period till 2020 and for a Further Perspective," approved by the President of the Russian Federation on September 18, 2008. It expires in 2019, so the State has initiated development of the new Strategy with a time horizon up to 2035. All these efforts demonstrate a strong focus on the part of the authorities on the Arctic zone. President Vladimir V.

Putin clearly demonstrated this focus in April 2019 by putting forward an ambitious program to secure Russia's foothold in the Arctic, including efforts to build new ports and other infrastructure facilities and expand an icebreaker fleet. Speaking at the Arctic forum in St. Petersburg attended by leaders of Finland, Iceland, Norway, and Sweden, Putin said that Russia plans to dramatically increase cargo shipments across the NSR.[9]

Summing up, it is extremely difficult to define where there are purely economic considerations, and where politics rule in Russia's Arctic development: they are so interlinked that it's nearly impossible to separate them. The only thing could be stated with certainty is that during the last five years the importance of the Arctic has increased dramatically on Russia's political and economic agenda.

Yamal LNG: The Story of Success

LNG projects are always complex, expensive, and notorious for delays and cost over-runs. How was Novatek able to achieve what many other more experienced international oil companies cannot, particularly in a harsh and remote environment such as the Arctic?

The Yamal LNG project was designed for natural gas production and the liquefaction and marketing of the South-Tambeyskoye natural gas field located in the northeastern part of the Yamal peninsula (in Russia's Yamalo-Nenets Autonomous Okrug), with approximately 926 bcm of natural gas (proved and probable reserves). The full project includes three trains with the production capacity of 5.5 mtpa each, plus an additional fourth train with a 0.9 mtpa capacity. Together, there is an overall capacity of 17.4 mtpa, and a field production of 27 bcm of natural gas per annum. The Final Investment Decision was signed in 2013 and the first train became operational by the end of 2017 and full capacity was reached by the end of 2019.

The project has been under discussion since the mid-2000s and was originally under the ownership of businessman Nikolay Bogachev before its acquisition by Novatek. In 2009, Gennady Timchenko, a Russian oligarch and personal friend of President Putin, increased his stake in Novatek[10] by 13.3 percent to a total of 18.2 percent[11] and entered the project by acquiring 51 percent of Yamal LNG for USD 650 million.[12] Initially, in 2011, when Total was entering the project, the consortium estimated the

cost of the project at USD 20 billion.[13]

For Novatek, the project was the only chance to gain access to the export markets (and margins), since Gazprom monopolizes (by law) all pipeline gas exports. So for Novatek, only a more challenging option—LNG production together with NSR development—was available.

Before being transferred to Novatek, the marketability of Yamal LNG was a matter of concern. The project progressively gained momentum when Novatek started attracting international oil companies to facilitate its marketing. The structure of the project took quite a long time to shape and evolved according to financing needs. In 2010-2011, the Russian company approached leading contenders active worldwide in the LNG field by asking them to acquire stakes in Yamal LNG, such as GDF-Suez (Engie since 2015), ConocoPhillips, ExxonMobil, Mitsui and Mitsubishi, Respol, ONGC and Qatar Petroleum. But U.S. and Qatari majors had shown no particular interest, since the development of liquefaction LNG plants would have helped Russia gain more flexibility at a time when these two countries were massively investing or about to invest in liquefaction LNG plants domestically.[14]

In the autumn of 2011, Yamal LNG became a joint venture owned by Novatek (80 percent) and Total (20 percent, for USD 425 million).[15] In April 2011, the French company had already bought a 12,0869 percent stake of Novatek.[16] A third shareholder entered in September 2013, when China's CNPC signed a memorandum to join the consortium and purchase a 20 percent equity share in Yamal LNG for USD 1 billion (Novatek sold its stake).[17] This agreement that provided a 20 percent equity share in Yamal LNG by CNPC offered the Chinese company access to Russian LNG, while the Russian company signed a 15-year supply contract for a minimum of three mtpa from Yamal to China.

As stated in the final investment decision signed in December 2013, the total cost of the project was estimated at USD 26.9 billion, USD 2.6 billion of which was already financed by the shareholders.

Experts were initially very sceptical concerning the project design in such a challenging permafrost and ice environment, but these concerns did not stop Novatek. The field development plan provided for the drilling of approximately 200 wells at 19 well pads and construction of a gas-gathering pipeline system. In 2013, the main tenders were completed and key contracts were signed as a part of the project implementation. In particular, the EPC contract has been awarded to the joint venture

of Technip (a French oilfield services company) and JGC (a Japanese engineering company). GE supplied six Frame 7E gas turbines, 18 centrifugal compressors, six variable speed drives and six Waste heat recovery units (WHRUs) for the LNG trains. So at the initial stage of the project development, Novatek managed to engage many leading international companies and equipment producers. It was tough, with all the counterparties looking for every opportunity to save or earn money. The exercise promoted a very strict financial discipline and monitoring of the project implementation schedule.

Due to the extreme climatic conditions in the region, the infrastructure was erected on pylons. In order to build the plant on the permafrost, 4,800 pylons, each one more than 35 m high, were anchored into the ground to support the gas facilities (weighing several dozen thousand tons) and ensure that they remain stable for the next decades.

Novatek was not only demonstrating excellent project management skills dealing with all the subcontractors, but it was also working in close cooperation with the Russian government to develop port infrastructure via "public-private partnerships." This stems from the fact that the authorities consider the port to have a strategic purpose beyond the LNG project. The hope is that all these projects will contribute to the development of Yamal and provide year-round navigation along the NSR. The federal budget for 2012-2016 allocated around USD 1.5 billion to the project (the money was spent on the construction of the port, a 50-km canal and ice barrier leading into the port, as well as navigational equipment), while Novatek has also invested USD 800 million.

It was a very smart step by Novatek to convince the authorities that Yamal LNG would be the flagship project for NSR development. Indeed, Yamal LNG provided 80-90 percent of all shipping through the NSR in 2016-2019. The associated marine transportation system has evolved, and these regional LNG developments connect Russia's Arctic to Europe and Northeast Asia with a new marine transportation system using advanced, icebreaking ships on destinational voyages.

As mentioned before, development of the Russian Arctic is a national priority, and the NSR, Russia's national Arctic waterway, is of personal interest to President Putin. Novatek has gained significant favor within the Russian government because it has developed Yamal LNG on time and on budget, and has significantly increased traffic on the NSR. Yamal LNG has become an anchor and central maritime hub for the NSR and enjoys

substantial financial and fiscal support from Putin and the ministries. Its success enhances Russia's leadership in the Arctic, strengthens Russia's influence in the Asia-Pacific region, and opens new markets for its Arctic natural resources. The developments in Yamal LNG play key roles in Russia's near-term economic health and contribute to an increasing Arctic share of Russia's GDP. These attributes confirm that Novatek will continue development of Arctic LNG 2 and plan for Arctic LNG 3 using public-private partnerships and foreign investment to support its growth strategy within this Arctic region. Significant to note is that Yamal LNG is the largest and the most successful ongoing natural resource development in the Arctic.

So, with the state's blessing and support, Sabetta port construction started in July 2012. Operation of the first stage of material offloading berths in the port of Sabetta began the next year, enabling the first winter navigation at the port and ensuring year-round delivery of construction materials. Early phase facilities at the Sabetta Sea Port consist of four quays with a total length of 915 m, capable of receiving Ro-Ro and Lo-Lo vessels. These facilities were designed for offloading of process modules and cargo. According to Decree No. 1128-r, issued by the Russian Government, dated 7 April 2013, the Sabetta port is open for entry of foreign-flag vessels. Its shipment infrastructure includes a jetty with two tanker-loading berths at the port of Sabetta equipped with ice protection facilities. Year-round navigation is ensured thanks to a special ice-management system.

The design of the seaport and its jetties draws on extensive studies of local sedimentology and ice behavior, conducted with the help of the Arctic and Antarctic Research Institute (AARI) in Saint Petersburg. The protective systems deployed are based on existing technologies that have passed muster in similar conditions at the Russian port of Dudinka. Two huge anti-ice barriers protect the Sabetta seaport and its tanker traffic from accumulations of ice during ice jams, and from drifting blocks of fast ice during ice break-up. A fleet of six icebreakers was mobilized to keep the port access channel free and clear and ensure year-round navigable conditions all the way to the LNG terminal.

A special design for LNG carriers was developed for the project. These ARC7 vessels (high ice class tankers, each able to transport 170,000 m^3) are well suited to the challenging climatic conditions of the Arctic and allow for year-round transport of LNG. ARC7 tankers can operate in temperatures of down to -50 degrees Centigrade and break through ice up

to 2.1m thick. In July 2013 South Korea's Daewoo Shipbuilding & Marine Engineering received a contract to build LNG tankers—a slot reservation agreement was signed for construction of 15 ARC7 ice-class LNG carriers. Yamal LNG indeed became a catalyzer for the NSR and Russia's Arctic shipping development, creating demand for shipbuilding—both for LNG tankers and ice-breakers (including nuclear ice-breakers). In June 2019 an agreement was signed among COSCO Shipping, Sovcomflot, Novatek and the Silk Road Fund to establish a long-term partnership to facilitate destinational and trans-Arctic navigation along the NSR; the companies are preparing to launch specialized operators for these purposes.

Other basic infrastructure was built in 2013, including the airport, roads, fuel storage facilities, utility networks, boiler houses, living quarters and canteens, as well as a power plant. The power plant, capable of generating 282 MW, was built by Technopromexport, while Siemens provided eight SGT-800 industrial gas turbines.

Yamal LNG was commissioned ahead of schedule, without any cost overruns, which is already a huge success for any LNG project, especially for a project located in such a difficult environment. In the course of the project's development, its capacity was increased by an additional 1 mtpa in Terminal 4, which is designed to use the Russian liquefaction technology "Arctic Cascade" and create additional profits for the project.

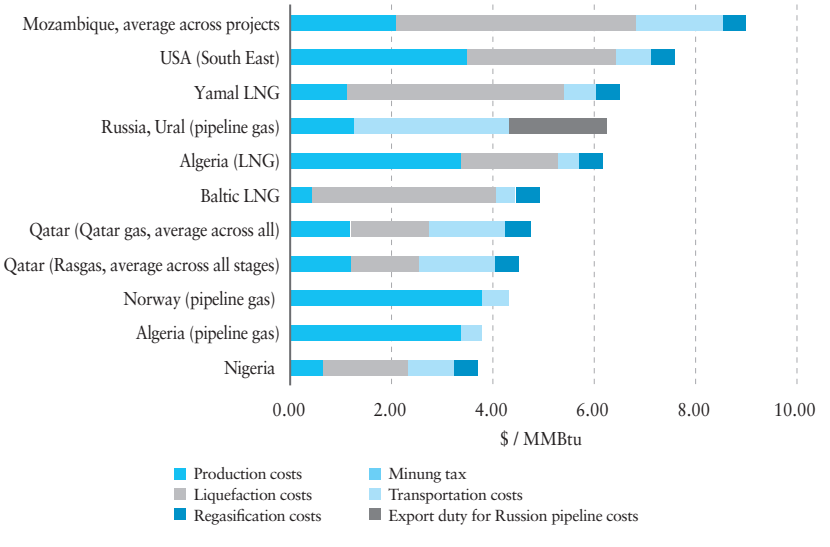
Will the global price of gas allow the long-term sustainability of LNG development in the Yamal/Ob region in the Russian Arctic?

LNG projects in the Far North cannot, by definition, be inexpensive. Russian LNG projects are facing additional difficulties given their geographical location, severe climate, and challenging transportation conditions. The need for complex and costly technical solutions for operating in this extreme environment raises costs and limits the competitiveness of Russian LNG.

Currently, in addition to the operational Yamal LNG, the most probable new Russian production LNG facilities in the Arctic include the Arctic LNG 2 project lead by Novatek, FID in this project was made in fall 2019. This is slated to include three lines of 6.6 mtpa each, with the resource base of the Utrennee field, in the Gydan Peninsula. Moreover, based on the available resource base in the Yamal and Gydan Peninsulas, Novatek is considering the implementation of Arctic LNG 1 and Arctic

LNG 3 projects of 19.8 mtpa each. This means growth in the aggregate capacity of the company's plants in the region up to 76.8 mtpa (taking into account the facilities under construction and the existing ones) by 2030, which is comparable to Qatar's effective capacities. In the longer run, beyond 2030 Novatek is projecting about 140 mtpa of LNG production and shipping from this region. Clearly, however, there is a long way to go to implement these ambitious plans.

With regard to full production and delivery costs, Russian LNG is not the most expensive on the global market; new Australian projects are much costlier and even U.S. LNG does not look more competitive than Russian LNG (Figure IV.1). Gas that is inexpensive to produce is the key competitive advantage of Russian gas. There is huge resource base available, provided by inland conventional gas fields, which is not the case with many of the new projects outside Russia, whose only sources are either offshore production or unconventional gas.



Source: T. Mitrova, A. Sobko, Z. Sergeeva. Global LNG Market Transformation: ways not to miss the window of opportunities for Russia. Skolkovo Energy Centre. April 2018. https://energy.skolkovo.ru/downloads/documents/SEneC/News/Russia-on-global-spg-market-Eng.pdf

Figure IV.1 Full costs of LNG and pipeline gas supplies to Northwest Europe in 2025

The weaknesses of Arctic LNG include the high costs of delivery to markets. LNG from the Russian Arctic has to struggle with high transportation costs of delivering LNG to Asia, either through the western route around Eurasia or through the NSR. In the severe climate conditions of the region, navigation through the Arctic waters remains extremely costly and risky.

For new projects that Novatek plans, there may be a significant cost reduction due to the Gravity Based Structure (GBS) LNG plant concept. The Arctic LNG 2 project envisages LNG plant construction offshore on a gravity-type platform (300 meters long and 150 meters wide), with an expected 30 percent capital cost savings. LNG plant construction on platforms would enable operators to cut the cost of logistics and to install the capital equipment "remotely." LNG lines will be built in the Large-Scale Marine Facilities Construction Centre in Murmansk, which Novatek is planning to develop in order to provide scalable construction of LNG trains on GBS platforms.[18]

Liquefaction cost (mostly capital costs) of Russian projects is USD 3.5-USD 4.2 per MBtu. Moreover, liquefaction plants' reliance on imported components is extremely high. New potential sanctions may put into doubt the ability to purchase the necessary equipment. All this makes it important

1	Landscape preparation, including land work, piles and thermal stabillzers installation	×
2	Construction of living modules	×
3	LNG train modules logistics, including the construction of special vessels for large scale modules	×
4	Logistics and testing of large scale modules	×
5	Construction in Arctic climatic conditions	×
6	Yards supervision	×
7	Contingency costs	×
8	Decrease of cost of metal construction, pipelines and infrastructure due to localization	√
9	In crease of LNG train capacity	√

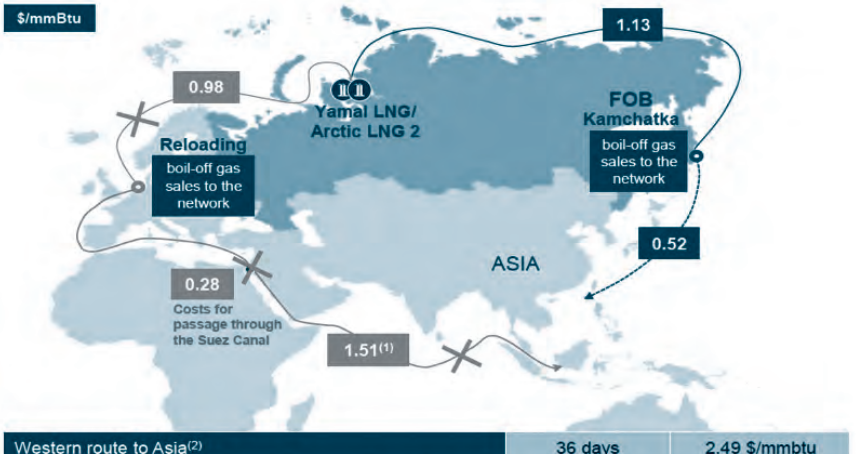
× : not required and will lead to cost reduction
√ : will lead to cast reduction

Source: Novatek

Figure IV.2 Lowering liquefaction costs—the role of different components

for Russia to develop its own natural gas liquefaction technologies or localize foreign solutions. Developing its own small-scale liquefaction technology is simpler than developing a large-scale one (and many more companies own such technology worldwide). Moreover, Russia already manufactures small-tonnage LNG plants with a capacity of up to 50,000-tonnes, in particular for export to China. As Novatek announced in December 2017, the fourth line of Yamal LNG plants (0.9 mtpa) will be fully based on the Russian liquefaction technology, "Arctic Cascade," which enables benefits from the region's cold climate. In March 2018, Novatek patented this technology.[19,20] This "pilot" will be tested as part of the fourth line of Yamal LNG plants and will become available for Novatek's new Arctic projects in the future. There are two areas of possible efforts: first, an attempt at increasing the single line capacity by shifting to full-fledged large-scale liquefaction; and secondly, the creation of a large-scale LNG plant based on a series of medium-tonnage lines.

Moreover, Novatek is also trying to optimize and reduce transportation costs by developing trans-shipment facilities in Murmansk and in



Source: Novatek.

Figure IV.3 Lowering transportation costs: Novatek's planned LNG logistics and costs

Kamchatka for 20 mtpa each. This would a reduction in the utilization of expensive Arc7 tankers (Figure IV.3).

Summing up, the costs of Yamal LNG came to USD 27 billion. (USD 1,740/ton under the integrated project, including mining costs). Arctic LNG 2 capital costs are planned to be USD 20 billion (25 percent lower). Savings are expected, in particular, from building up a floating LNG plant platform, meaning that the capital equipment may be installed remotely (at the Kola wharf in Murmansk). In both cases, it will still be required to use some foreign technology and at least some auxiliary equipment. However, domestic equipment may well be used for subsequent projects, such as Arctic LNG2 and Arctic LNG3, based on the company's patented technology. All in all, these efforts have a potential to make LNG from Russian Arctic quite competitive on the international market.[21]

What have been the major technical and economic challenges in development of Yamal LNG, and how important has imported technology been, both Western and Chinese?

The most significant problem of Yamal LNG was associated with financial sanctions. The project was removed from the traditional international project finance market by international sanctions, and faced challenges concerning key equipment supplies. U.S. Export-Import Bank (EXIM) has refused to participate in financing the USD 27 billion project because NOVATEK's major shareholder, Gennady Timchenko, is on the U.S. sanctions list. EXIM received an application in November 2013 to support exports of U.S. goods as one of many lenders to the project, but in May 2014 EXIM dropped out of the project due to the sanctions imposed against Timchenko. Moreover, in April it was reported that the Japanese companies Mitsubishi and Mitsui halted negotiations on purchasing a 10 percent stake in the Yamal LNG. Finally, China's CNPC purchased a minority share of 20 percent, and in 2016 the Silk Road Fund acquired 9,9 percent of the project (thus Chinese participation has clearly exceeded the 20 percent hold by the French multinational company Total). Finally in April 2016, Yamal LNG managed to finalize its financing thanks to the Chinese loans amounting to €10.6 billion (USD 11.7 billion).[22]

Another problem was associated with the technology. Key parts necessary to get the job done—in particular, the cryogenic heat exchangers comprising the final stage of the liquefaction train—were all to be supplied

by U.S. or European companies. LNG technologies do not fall under either the U.S. or European sanctions. But the fact that all the liquefaction units had to be imported was still creating many risks. This situation provided Chinese companies an opportunity to expand their manufacturing capabilities to another part of the LNG supply chain. China Offshore Oil Engineering Company (COOEC), a subsidiary of China National Offshore Oil Corporation, built 36 core modules for Yamal LNG, mastering this technology through participation in the project. The modules were the first to be independently designed and manufactured by a Chinese firm. This breakthrough is in line with Beijing's plan for China to move up the value chain in manufacturing ocean engineering equipment, which is part of a broader effort to transform China into a global leader in advanced manufacturing.[23]

How important has the political support for Yamal LNG been and can competition/conflict with Russian pipeline exports put a brake on state support for further Russian Arctic LNG development?

For Novatek, Yamal LNG is the company's largest project, on which it has placed all its bets and holds the only chance to obtain an export margin. From the perspective of the Russian state, Yamal LNG is not just an economic issue, but has also become a political issue. Firstly, the project is developing Russia's presence in the Arctic and along the NSR, which has immense geostrategic importance for the country. From the very beginning, the government regarded Yamal LNG as a strategic project and has granted it exceptional tax breaks and support from the National Welfare Fund for transportation infrastructure development. Secondly, sponsors of the project are under scrutiny from U.S. regulators. And third, it will be competing with U.S. LNG both in Europe and in Asia, which spices things up a bit.[24]

Since Russian gas supplies to Europe started to stagnate and decrease in 2009-2014, Russia's leadership began repeatedly naming LNG export development as a top priority. LNG is supposed to help in achieving a set of state objectives, namely: entering new markets, increasing export volumes, promoting new technologies, enabling the development of related industries, supporting the development of critical regions such as the Arctic and the Far East, firmly establishing the strategic importance of the NSR, and strengthening Russia's geopolitical influence in the Asia-Pacific region.

So for Russia, LNG is not only one of many possible means to transport gas, but rather a new stage in its gas export policy and an instrument to reach new markets and to become more flexible in response to dramatically changing global gas markets.

Indeed, the Yamal LNG project makes it possible to achieve some of the objectives set by the Russian government. European and Asian markets are accessible through the NSR, with a westbound winter route (from November until June) and an eastbound summer route for the rest of the year.

The achievement of all these objectives has required both strong direct and indirect support from the government: providing financial support, removing environmental costs (e.g. environmental fines from harmful activities such as dredging are covered by government funds),[25] and allocating direct spending (for the construction of port harbours, seaway channels, etc.). Yamal LNG has been exempted from a number of taxes. Without these tax breaks and other government support measures, the project would almost certainly not have been completed. These include a tax break on the Mineral Extraction Tax (MET) for 12 years, reduced taxes on profits, and zero property tax. For example, in October 2013, President Putin ordered authorities to provide a new tax break for gas production, which helped Novatek to save more than USD 4 billion and helped the company boost its resource base.[26]

So, this support from the State for Yamal LNG has been very important. And theoretically if competition/conflict with Gazprom would put a brake on state support for further Russian Arctic LNG development, Yamal's economic sustainability would be challenged. It would be more difficult for them to make profits, for example, if all normal taxes were applied. Nevertheless, with all the cost reductions planned by Novatek (see above), it allows the company to be quite optimistic about the future of its projects.

Wouldn't Yamal-Europe 1 and 2 pipelines be more economical, safer and more efficient than an Arctic marine transportation system?

The answer to this question should be put into the perspective of the competitive environment in the Russian gas industry and the strong rivalry among Gazprom, Novatek and Rosneft.

The pipeline system from the Yamal peninsula includes two gas

pipelines (Bovanenkovo-Ukhta and Bovanenkovo-Ukhta 2) that were built by Gazprom in order to transport gas from the Yamal Peninsula into Russia's Unified Gas Supply System (UGSS) (Figure IV.4). This is indeed a monumental project, the largest in the world: the length of each gas pipeline is around 1,200 kilometers; the pipe diameter is 1,420 millimeters; the working pressure 120 atm; and the aggregate design capacity of two gas pipelines is 115 bcm per year.

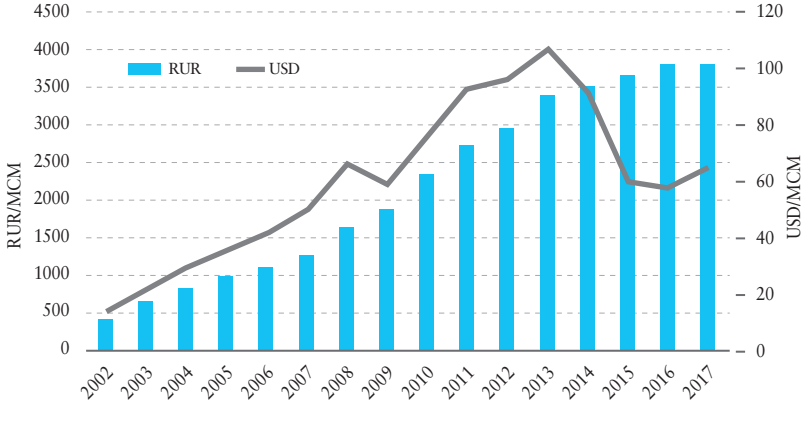
The construction of the first Bovanenkovo-Ukhta gas pipeline started in 2008 and it came online in 2012. The construction of the Bovanenkovo-Ukhta 2 gas pipeline was launched in 2012. In 2017, the pipeline was brought online. The pipeline system turned out to be extremely technologically challenging and expensive. One on the most difficult parts was construction of the pass across the Baidarat Bay, a gulf in the Kara Sea, which is covered with ice most of the year. This is the reason why, for the first time in global history, engineers utilized 1,219-millimeter concrete-

Source: Gazprom website (https://www.gazprom.com/projects/bovanenkovo-ukhta/)

Figure IV.4 Bovanenkovo-Ukhta trunk line system

coated pipes designed for the pressure of 120 atm. Gazprom has invested more than USD 40 billion[27] in this project alone, not including development of the Bovanenkovo field itself. It is Gazprom's project, and the company is also building a new huge gas production center in Yamal. Pipeline capacity expansion is completely synchronized with this field production profile. That said, it is quite clear that Gazprom would not welcome attempts on the part of the other players—primarily Novatek—to use this pipeline for the transportation of their gas. Moreover, there would be simply no place left there for the non-Gazprom producers.

But even if we assume that Gazprom could be forced by the Government to provide guaranteed third-party access for Novatek to the Bovanenkovo-Ukhta pipeline, it still seems that this project would not be attractive for Novatek. Gazprom holds a pipeline gas export monopoly, while for LNG exports regulation is more favorable; in December 2013 three Russian companies (Novatek, Rosneft and Zarubejneft) obtained permission to export LNG. So in the current institutional framework the only chance for the non-Gazprom producers to get a higher export price for their gas is to liquefy it. Otherwise, it's unlikely they would invest in gas production, as domestic gas prices since 2014 have fallen dramatically due to the devaluation of the ruble (Figure IV.5), and do not justify investments in Arctic field development.



Source: Gazprom.

Figure IV.5 Domestic average sales prices (w/o VAT)

With respect to the cost-competitiveness of these two routes (Bovanenkovo-Ukhta and maritime transportation of LNG from Yamal to Europe), pipeline gas transportation is obviously cheaper than for LNG (by approximately 60 percent, according to SKOLKOVO Energy Centre calculations), but LNG exporters do not have to pay the 30 percent export duty,[28] which makes their economics more attractive.

So, it is extremely difficult to say which of these two transportation routes is more economical and efficient. As for environmental impacts, both pipeline gas and LNG transportation and facilities construction pose a certain threat for this extremely fragile region. But there are also additional considerations, which are really important for the government and which give some additional advantages for LNG projects: they will provide Russia with greater flexibility of exports; and more importantly, an active presence in Asian markets. Their strategic value in the eyes of the government is immense.

There is of course an existential question left, whether Russian hydrocarbon resources can be developed at a low enough cost and quickly enough to remain viable if alternative energies compete on the global marketplace. Yamal gas resources are a good example of the so-called "Arctic Paradox" where more hydrocarbon extraction in the Arctic is only possible because of climate changes brought on primarily from the burning of fossil fuels. Accessing more hydrocarbons to burn for fuel will only exacerbate these conditions, which may temporarily appear to be economic advantages but may prove to be disastrous to global ecological and economic systems, and for the Russian Arctic first of all (due to the increasing threat of permafrost melting and destabilization of methane hydrates). So the nature itself as well as the global response to climate change, while not robust at the moment, might challenge all these plans on LNG development in Arctic in the future.

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Impact of Military Security Considerations on Resource Projects in the Russian Arctic

Andrei Zagorski

The development of the Russian Northern Sea Route (NSR) is based on a mix of investment that comes, or is expected to come, from both public and private sources. Normally, mineral resource development is primarily a private-sector responsibility. However, the infrastructure required for these projects to be feasible in the Arctic (such as port facilities and terminals, airfields, hydrographic and bathymetric works, charting, meteorological services, surveillance, and communications etc.) is, in most cases, dependent on public money—provided that the government has approved the respective economic projects. This is especially true when it involves the marine shipping of extracted minerals and hydrocarbons.

Defense budget appropriations are an important source for maintaining, modernizing and developing infrastructure in the Russian North, including the NSR. The relative importance of this defense funding, however, differs depending on the geographic area and type of work. As shown in Figure IV.6, defense budget appropriations dedicated to the Arctic are projected to provide the bulk of routine public investment into the development of infrastructure in the Russian Arctic in the coming years. Although figures included into the most recent (2017) State Program for the social-economic development of the Russian Arctic[1] are speculative at best, defense expenditures are projected to be the single most important public money source (between 75 percent in 2019 and 83 percent in 2025) for the development of the Russian North, including NSR infrastructure.

For instance, according to an early 2019 assessment by Rosmorrechflot (an agency under the Ministry of Transport in charge), the demand for investment into the maintenance and development of the NSR in the next five years is likely to be at the level of 905.6 billion rubles (roughly 14.5 billion USD based on the current exchange rate). One third of this amount is supposed to come from appropriations for operations of the Northern Fleet, while the rest is expected to come from third-party (private) sources.[2]

However, the contribution of defense-sponsored investment for the development of the NSR infrastructure is spread unevenly across the route itself and involves different types of projects. This investment is of particular

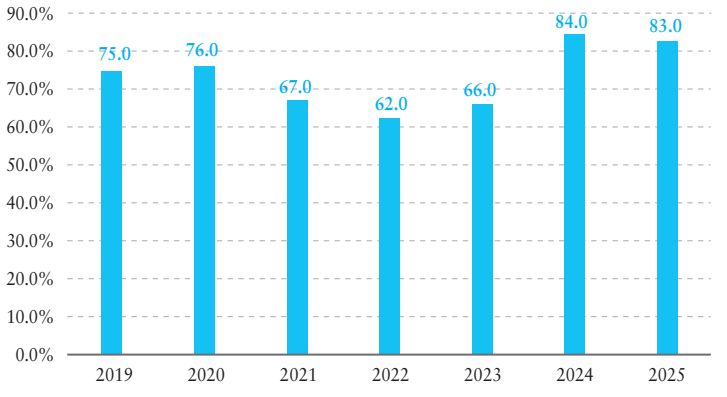

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Figure IV.6 Share of defense appropriations included into projected public funding for the development of the Russian Arctic including the development of the NSR

importance for the maintenance and modernization of basic infrastructure (such as port facilities or airfields) in remote northern regions, including islands, in the eastern part of the Russian Arctic coast where economic activity remains low. It is also of particular importance for work such as bathymetric research or satellite surveillance and communications, which are largely or entirely seen as a job for the defense sector.

In areas of growing economic activities and importance that require more intensive infrastructure development, the contribution of defense spending is much less obvious, and additional public funds must be allocated on a case-by-case basis (often beyond the projections included in the State program). This is particularly true with respect to infrastructure development in the Kara Sea basin. This region is becoming, or already has become, a new focal point for economic activities—as resource development moves from the basins of the Barents and Pechora Seas in the West further East, and from old hydrocarbon provinces in West Siberia further north. With the Yamal and Gydan Peninsulas, and partly the Taymyr Peninsula (its western part) becoming the major areas of economic development, additional public money is increasingly required to support

these projects.

NOVATEK's projects exemplify this trend. The need to supply the construction of its first LNG plant and to ship out its production was the single most important reason for the Russian government to heavily invest into the construction of the deep-water port of Sabetta in the north of the Yamal Peninsula—the major infrastructure development on the NSR of the recent decades. The promise of significant Arctic LNG production also motivated the government to build three new *Arktika*-class nuclear-powered icebreakers in order to facilitate year round westbound vessel traffic from the Kara Sea basin. Development projects in the Kara Sea basin are also supported by investment to expand the Murmansk port facilities in the Barents Sea (outside the NSR). These facilitate cargo reloading from ice-class ships to regular vessels, as well as, prospectively, by considering the construction of a reloading facility on the Kamchatka Peninsula (also outside the NSR) in order to facilitate the eastbound shipment of resources extracted in the Kara Sea basin.

As NOVATEK moves along with its plans to build another LNG plant on the Gydan peninsula on the eastern bank of the Ob' river bay ("Arctic LNG-2")—just across the port of Sabetta—it seems to have successfully secured public funding for the relevant infrastructure development. In March 2019, President Vladimir V. Putin endorsed the allocation of additional funds in the 2020-22 budget of the Russian Federation for the construction of the terminal *Utrenniy* in order to facilitate the supply of construction materials and modules for the erection of the new LNG plant and, at a later stage, the shipment of its production. This decision reportedly would happen at the expense of the Moscow-Kazan railroad, the funding of which seems to have been put on hold again.[3] Necessary dredging work already began in 2019 for Arctic LNG-2, with relevant funds reallocated from the budget for building new icebreakers.[4]

Defense and Economic Activities Coordination

The maintenance and modernization of defense infrastructure in remote areas along the coasts and on the islands of the eastern Russian Arctic seas (Laptev, East Siberian and Chukchi Seas) based on the "dual-use" concept (making ports and airfields also available for civil use) gives the defense establishment key leverage over decisions in areas of lower economic

activities along the NSR route. At the same time, the expansion of mineral resource development in the Kara Sea basin and growing economic activities in the Barents and Pechora Seas basins change the pattern of involvement of the defense sector in decision-making with regard to particular projects: the defense sector has a say but also needs to accept the "national" interest in developing approved projects.

The importance of security considerations differs depending on the significance and intensity of military activities in specific areas of growing economic activity. The area of responsibility of the Northern Fleet does not extend throughout the NSR. It ends in the Laptev Sea with the eastern seas (Chukchi, East Siberian and, partially, the Laptev through the port of Tiksi) being in the area of responsibility of the Pacific Fleet. The intensity of naval activities in these seas differs significantly. The Barents Sea (outside the NSR) remains the major area of operation of the Northern Fleet, with its main bases being located on the Kola Peninsula. At the same time, neither the Northern nor the Pacific Fleet operate regularly further east along the NSR. Their activities here are limited to supplying the bases on the islands during the navigation season from July through October. Naval exercises in the Kara Sea and further eastward are infrequent and involve applying routine rules of advance notification and closing of particular water areas for other maritime activities in order to provide for safe navigation.

As the government of Russia is generally dedicated to the development of terrestrial resources in the Kara Sea basin, and as the defense operations here remain limited, the coordination of decisions concerning the infrastructure investments in that area seems to be smooth. From the very beginning, the port of Sabetta was conceptualized as a port that would be open to vessels flying foreign flags. Most recently (in June 2019), the port of Dixon (on the north-western shore of Taymyr Peninsula) was opened for vessels flying foreign flags, thus further opening the area for international commercial activities.[5]

The Northern Fleet has a more vested interest in the Barents Sea, and particularly on the Kola Peninsula where its main bases are located. Here, a more comprehensive process of coordination is required. Its outcome depends on both the vested interest of the government and the lobbying capacity of the respective business operators. For instance, in 2019, NOVATEK moved the reloading of its LNG from ice-class carriers to regular vessels from Norway to the north of the Kola Peninsula in proximity of the main Northern Fleet bases. This requires consent of the

defense establishment, mediated through the Ministry of Transport. Taking the lobbying power of NOVATEK and the general desire of the Russian government to locate as many activities as possible throughout Russia, it has good chances of succeeding despite the sensitivity of the issue for the Northern Fleet.[6]

Any progress in building a reloading facility on the Kamchatka Peninsula—another sensitive area of operations of the Russian Navy—would also require consent from the defense establishment. Considering the importance of the project, this coordination should also be expected to proceed smoothly if year-round eastbound shipment of resources from the Russian North becomes feasible.

At the same time, in 2019, the Security Council of the Russian Federation blocked the pursuit of a proposal to build an international deep-water port in Pechenga in the northwest Murmansk region near the Norwegian border, which is still in the geographic proximity to Northern Fleet bases. Engaging the Security Council was an unusual procedure, which highlighted the fact that objections coming from the defense establishment were the most important reasons for the rejection of the proposal.[7]

These examples highlight the trend toward the continuous opening of the Russian Arctic, despite concerns from the defense establishment. This trend follows the progressive increase in economic activities involving growing international cooperation and benefits from the overall low-tension security environment. Mechanisms for coordination of respective infrastructural investment between the relevant governmental agencies are in place and seem to be sufficient to support this growing openness. However, should the security landscape change and military tensions in the region increase, this trend may be reversed, and coordination of economic activities with the defense establishment would become more difficult—particularly in the areas of location of the most sensitive defense facilities.

Diminishing Competition between Defense and Commercial Sectors

The resumption of seasonal operations of the Northern Fleet east of the Barents Sea after 2013 required the provision of icebreaker support in particular areas, depending on the ice conditions. This task is served by both nuclear-powered and conventional (diesel-electric) icebreakers on

the same grounds as they provide such services to other clients. However, as vessel traffic related to the shipment of resources from the Kara Sea basin increases, the current icebreakers' capacity is assessed as insufficient to provide the required volume of services to all clients. This pushed the Russian government to consider decisions in two directions.

On the one hand, it is considering to further increase the number and the capacity of icebreakers (both nuclear powered and conventional) operating along the NSR. Currently, there are eight linear icebreakers operating in the area. Four of them are nuclear powered and four are diesel-electric.[8] As the implementation of the program of replacing ageing nuclear icebreakers with new ones was repeatedly postponed, the period of operation of old nuclear icebreakers was extended until 2025-28. Based on estimates of the volume of hydrocarbon and other resources to be shipped out (with oil and gas companies set to remain the single most important clients of Atomflot), it is assumed that, after 2030, a total of eight nuclear icebreakers would be required to meet the demand.[9] Taking the four currently operating but scheduled to be phased out by that time, and three new vessels to be introduced around 2020, this would require the construction of five more nuclear icebreakers in addition to those secured by the current program. The construction of two additional icebreakers is currently being considered, pending available funding and negotiating a new mode of financing with the government, which is not (yet) ready to cover more than 50 percent of the costs.[10]

On the other hand, the government has resumed the program of building conventional icebreakers for the Navy in order to make it less dependent of the availability of commercial icebreakers.[11] In 2017, a new *Ilya Muromets*-class icebreaker designed for operations in the North began sea trials. It is conceptualized as an unarmed support ship capable not only of escorting or tagging Navy ships, but also of delivering supplies to coastal bases in the Arctic, conducting hydrographic research, and providing oil spill and fire response. Although it is much less capable that the new nuclear icebreakers under constriction (it can navigate in areas with one-meter ice cover as compared to three meters by nuclear icebreakers), it seems to be a fit for the current seasonal missions of the Northern Fleet east of the Barents Sea. There are plans to procure a total of four such icebreakers for both the Northern and the Pacific Fleets (two for each).[12]

Apart from this, since 2016 the Coast Guard North has operated a new, lightly-armed ice-strengthened patrol vessel of the "Ocean" class (the

second ship of this class began sea trials in 2018). In total, the Coast Guard had reportedly planned to procure five such ships for operations, both in the western and eastern parts of the Russian Arctic. However, for financial reasons, the procurement program has been so far reduced to three ships.[13]

Conclusions

The Russian president and government continue to prioritize investment into defense and infrastructure projects to support economic development in the Arctic, particularly the development of resources of the Kara Sea basin. Both suffer from resource shortages and the ineffectiveness of government spending, with projects being regularly postponed. An intra-governmental mechanism is in place to mitigate and/or resolve eventual conflicts between security and economic development interests, although the operation of this mechanism largely depends on the relative lobbying power of the relevant operators.

The gradual extension of economic development of the Russian Arctic farther East to the Kara Sea basin has organically promoted further opening of the region for international cooperation, while the defense sector still remains an important provider of "dual-use" infrastructure in the eastern parts of the Russian coast and on the islands. This development has largely benefitted from the three decades of low tensions in inter-state relations in the Arctic. However, the currently growing securitization of the Arctic may reverse this trend.

There is no direct competition for public funding between the defense sector and the business community. The redistribution of funds takes place within the relevant sectors rather than between them and often results in postponement or delay of implementing individual projects. This is obvious in the area of economic development where some projects (NOVATEK is one example) are supported at the expense of others. There also is a tacit competition within the defense sector for available resources. Although clear priority is given to restoring capabilities for surveillance and early warning, for air defense and for anti-submarine warfare (the main purposes of the renewed Russian bases in the North), they are often delayed due to the shortage of resources. Investment into the Naval capabilities of the Northern Fleet, however, clearly suffers from competition with investments into the Black Sea and the Pacific Fleets.

Notes

1. Drafts of an updated State program are being discussed in 2019 parallel to the drafting of a new Russian Arctic strategy and the updated comprehensive program for the development of the NSR, so that particular numbers are continuously changing.
2. *Мониторинг социально-экономического развития Арктической зоны России. Информационный бюллетень [Monitoring of socio-economic development of the Arctic zone of Russia. Information Bulletin]*. 2019, no 36 (1-31 January), p. 6.
3. *Monitoring of socio-economic development of the Arctic zone of Russia*. 2019, no 38 (1-31 March), p. 17-18.
4. *Monitoring of socio-economic development of the Arctic zone of Russia*. 2019, no 40 (1-31 May), p. 12.
5. *Monitoring of socio-economic development of the Arctic zone of Russia*. 2019, no 41 (1-30 June), p. 10.
6. *Monitoring of socio-economic development of the Arctic zone of Russia*. 2019, no 39 (1-30 April), p. 13.
7. *Monitoring of socio-economic development of the Arctic zone of Russia*. 2019, no 41 (1-30 June), p. 11.
8. *Monitoring of socio-economic development of the Arctic zone of Russia*. 2019, no 3 (1-15 March), p. 14. This number does not include smaller icebreakers providing local services in ports.
9. *Monitoring of socio-economic development of the Arctic zone of Russia*. 2017, no 13-14 (1-31 August), p. 5.
10. *Monitoring of socio-economic development of the Arctic zone of Russia*. 2019, no 40 (1-31 May), p. 10.
11. The Northern Fleet used to operate its own fleet of conventional icebreakers. In the 1960-80s, a total of 32 specially designed icebreakers of the "Ilya Muromets" class (named after an epic hero of the Kievan Rus') were built in the Soviet Union with few of them still in operation in a number of ports. Новый ледокол "*Илья Муромец*": *шаг длиной в 40 лет* [*A New Icebreaker "Ilya Muromets": A Step That Took 40 Years long*], Technorussia.su, 22 December 2017. http://tehnorussia.su/vodnyj-transport/76-morskoj-transport/1070-ledokol-ilya-muromets
12. See, e.g.: A New Icebreaker "Ilya Muromets": A Step That Took 40 Years long; "Илья Муромец"—новый ледокол-снабженец с немецкими корнями ["*Ilya Muromets*"—*A New Supply Icbreaker with German Roots*], Korabel.ru, 14 June 2016. https://www.korabel.ru/news/comments/ilya_muromec_-_novyy_

ledokol-snabzhenec_s_nemeckimi_kornyami.html; *Капитан "Ильи Муромца": ледокол поможет возродить Арктику* [*The Captain of "Ilya Muromets": The Icebreaker Will Help to Revive the Arctic*], 1 December 2017. https://flotprom.ru/2017/СеверныйФлот81/

13. Второй ПСКР проекта 22100 вышел на ходовые испытания [The Second Border Guard Patrol Ship Began Sea Trials], Voennoe Obozrenie [Military Review], 24 May 2019. https://topwar.ru/158217-vtoroj-pskr-proekta-22100-vyshel-na-hodovye-ispytanija.html

Environmental and Indigenous Concerns Regarding the Development of Yamal LNG

Tatiana Burmenko

Viewed strictly from a business point of view, global warming and the rapid reduction of Arctic sea ice are advantages for development of the Yamal LNG and the Northern Sea Route (NSR). The hotter the Arctic gets, the better business will be—at least for a little while. From an environmental point of view, natural gas has certain advantages over other fossil fuels, since when it is burned, much less CO_2, SOx, NOx are released into the atmosphere (IGUb 2015; Vard 2015). At the same time, as in any other production, every element in the LNG life cycle—including the construction of industrial facilities, preparation and liquefaction of gas, storage, transportation and regasification—has an environmental impact. Gas liquefaction plants and regasification terminals, as well as LNG transportation, damage the air, soil, water bodies, flora, and fauna.[1]

When discussing the development of natural resource extraction in the Arctic and climate change, we should not forget to consider the so-called "Arctic Paradox" (Figure IV.7). The scientific literature documents that the burning of fossil fuels has accelerated the ice-melting process in the

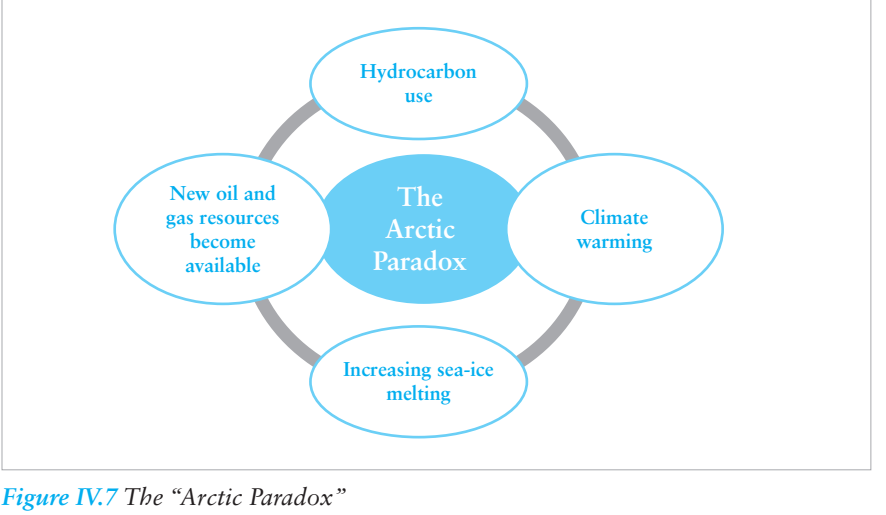

Figure IV.7 The "Arctic Paradox"

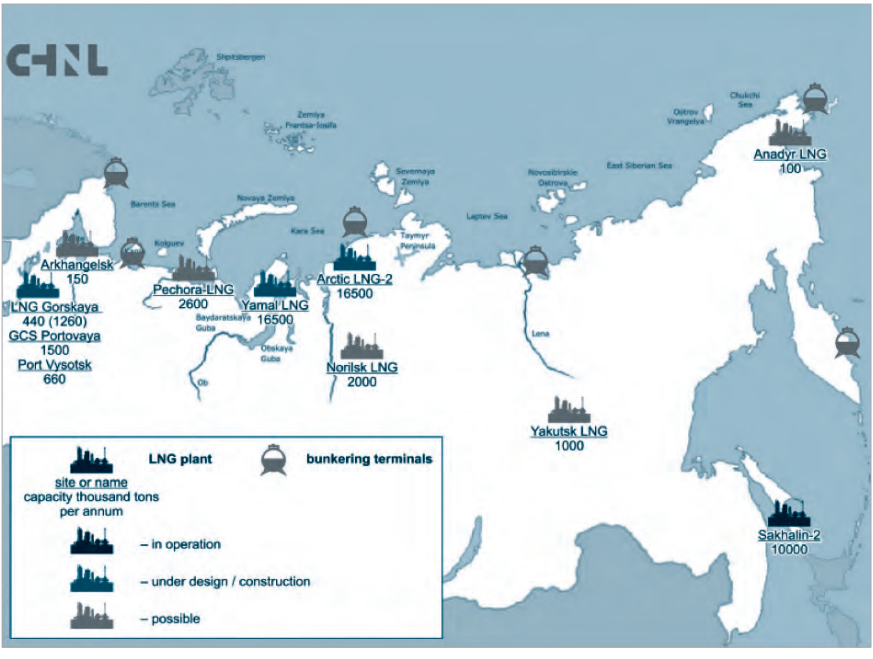

Figure IV.8 Map of possible LNG production plants along the NSR[2]

Arctic, which also contains large reserves of fossil fuels. The rapid Arctic ice melt in turn attracts oil and gas development companies to the Arctic, thereby increasing the volume of fossil fuel extraction. As a result, we have a vicious cycle: increased hydrocarbon extraction leads to further climate changes in the Arctic. This situation can lead to biological, environmental, socio-economic, and other disasters.

One of the most important environmental issues arising from these developments is the increased ship traffic along the entire NSR. At the moment it is quite difficult to predict the delayed and cumulative effects on the environment from this increase in the number of vessels, which is expected to continue.

It is clear that a range of potential environmental contamination issues need to be explored. Away from shore, for example, the consequences of an accident are dire. Largely undeveloped infrastructure along the Arctic coast can leave ships in distress pretty much on their own. Leaks of heavy ship oil can foul pristine waters far out of reach of crews that could clean them. Major oil spills and other mishaps would be nearly impossible to combat.[3]

Oil and chemical spills are highly hazardous for the Arctic environment.

Oil spill cleanup in ice-covered waters is an extremely complex process, and there are very few response measures to these kinds of spills. Consequently, the main focus to ensure the region's safety should be prevention of oil spills. A considerable increase in anticipated oil shipment volume in the Russian Arctic (up to 30 ml. t by 2025, and up to 40 ml. t by 2030) dramatically increases the risk of spills during oil transfer and shipment. As the natural resources of the Arctic are being developed, environmental protection, including oil spill prevention measures, is being given special attention. But the effectiveness of oil-spill cleanup measures in Arctic conditions still raises questions.[4]

Due to its physical qualities, LNG doesn't cause the same amount of environmental damage as oil in the event of a spill on land, ice, or water. Over the years that LNG has been in use, there have been no major accidents that have led to large quantities of LNG being spilled on land, or water. According to DNV-GL, throughout the years of LNG shipping, the largest spill contained 40 m^3 of LNG.[5] LNG storage temperature is considerably lower than atmospheric temperature, even during Arctic winters.

The switch away from oil fuels and the use of LNG considerably reduce

Table IV.1 Pollutant emissions when using HFO and LNG, kg/t

	HFO		LNG	
	2011	**2030**	**2013**	**2030**
CO_2	3130	3130	2751.1	2751.1
CH_2	0.3	0.3	26.5	3.0
N_2O	0.08	0.08	0.05	0.05
Other hydrocarbons	2.4	2.4		
SO_2	54	10.8		
NO_x	78	74.958	23.0	23.0
CO	7.7	7.4		
PM	5.3	4.24		
BC	0.35	0.35		
OC	1.07	0.856		

Source:
HFO - Peters, G. P., T. B. Nilssen, L. Lindholt, M. S. Eide, S. Glomsrød, L. I. Eide, and J. S. Fuglestvedt. "Future emissions from shipping and petroleum activities in the Arctic." *Atmos. Chem. Phys.* 11 (2011): 5305–5320.

LNG as an alternative fuel for the operation of ships and heavy-duty vehicles, Federal Ministry of Transport and Digital Infrastructure (BMVI), 19 December 2011, Germany.

environmental emissions from shipping. In any case, using natural gas as a marine fuel leads to a reduction in atmospheric emissions, with SOx and particulate matter demonstrating the most noticeable decrease, and NOx emissions cut by 80 percent. Greenhouse gas (GHG) emissions from using LNG are also lower. Methane emissions, however, have a very significant effect, including methane slips in gas and converted dual-fuel engines. The environmental sustainability of LNG greatly depends on the modes and types of marine engines used. The most common propulsion systems are two-stroke and four-stroke diesel engines.

The intensive development of the Arctic calls for up to 5-6 ml. tons of marine fuel shipments per year, as well as for the development of transshipment, storage and bunkering infrastructure for oil, coal, and gas transit and shipment. Under conditions where the Russian government has to create such infrastructure practically from scratch and there are huge amounts of LNG available, relevant officials should pay particular attention to a quick transition from oil-based fuels to LNG. This will enable shipping

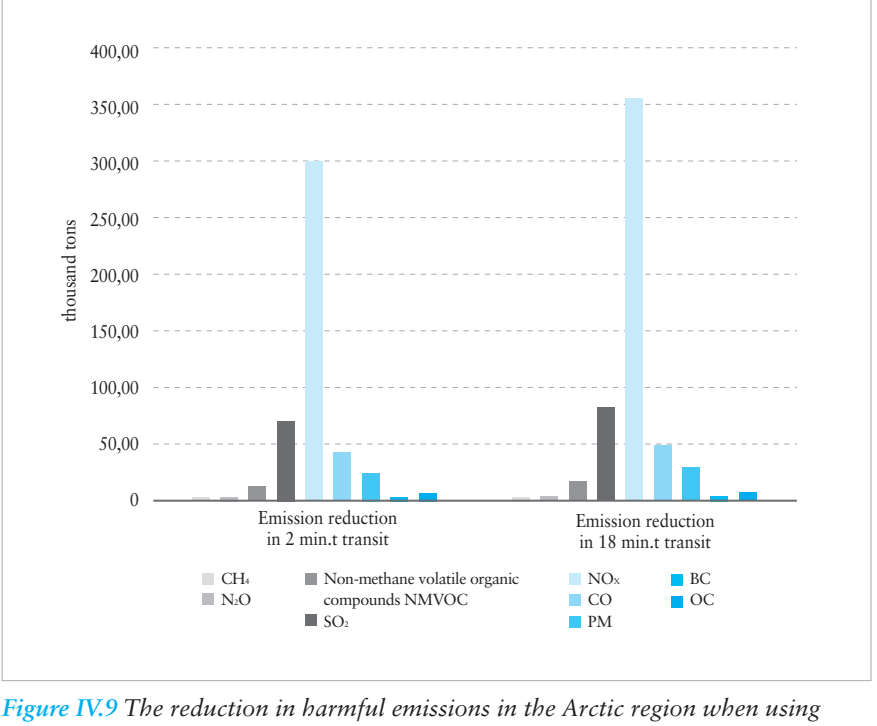

Figure IV.9 The reduction in harmful emissions in the Arctic region when using LNG as marine fuel (with the exception of CO_2)

and transit cost reductions and will ensure the protection of sensitive Arctic ecosystems from some harmful emissions and dangerous oil spills.

The intensification of shipping in the Arctic and, in particular, the movement of icebreakers and tankers in the Gulf of Ob to the NSR, will increase due to the implementation of the Yamal LNG project, as well as the development of the Novoportovskoye and other hydrocarbon deposits on the Yamal and Gydan peninsulas and in the Ob Gulf.

The Yamal Ob Bay, which washes the peninsula of Yamal, looks like the sea, but in reality it is a fresh-water bay, into which the Ob River flows. Recently it has been documented that a particular fish species started to disappear from the Ob Bay; there used to be a lot of omul, but now its numbers have plummeted. Most likely, the main cause is in large-scale dredging operations, during which 16 million tons of sand were raised from the bottom of the Gulf of Ob for road construction. Back in 2012, researchers had warned that such work could affect the fish population.

In addition to fish, beluga whales experience negative impacts from the development of LNG projects. Presumably, the main types of impact on beluga whales will come from:

- Noise impacts. Beluga whales have been proven to sense and react to the presence of icebreaking vessels at distances up to 50 km (Jefferson et al. 2012). Anxiety behavior will manifest itself at distances of several tens of kilometers. A behavioral response to sounds from breaking ice involves moving away from the source of noise, changes in sounds made by beluga whales, changes in behavior when diving, and avoiding noise exposure over the next days. Researchers, however, concluded that lone beluga whales would not approach a noise source a distance sufficient for noise to disturb their communication systems or damage their auditory system (ENVIRON 2014).
- Habitat loss. Observations show that the annual mass appearance of beluga whales in the Gulf of Ob falls at the end of June-July and can stretch into the beginning of August. Here, according to some researchers, in addition to feeding, calves are born (Belkovich 2015). A systematic noise impact, as well as increased ship traffic in the Gulf of Ob, can cause beluga whales to leave this key seasonal habitat critical for their feeding and breeding.
- Collision with ships. Studies of beluga whales show that the species has sensitive hearing, well-developed echolocation and the ability to

detect objects around them, good maneuverability and the ability to dive. As a result, it was concluded that beluga whales are the least likely to collide with ships compared to other marine life inhabitants, such as *balaenidae* (ENVIRON 2014). Despite this, there is evidence of collisions between vessels and toothed whales such as beluga whales (Janet et al. 2012; Lesage et al. 2014).

- Chemical pollution (intoxication). Beluga whales have a longer life span compare to fishes. As a result of industrialization of the Arctic, toxic substances enter the body of belugas through food, and they bio-accumulate relatively high concentrations of toxins in tissues—especially fatty ones (Jefferson et al. 2012; Wright 2014). It is believed that even a low concentration of pollutants in polar animals has a negative biological effect on both their body and population (Medvedev and Ivanter 2007). The development of industrial projects in high latitudes, coupled with global warming and, as a result, the melting of glaciers in the Arctic, will contribute to the intensification of sea traffic in Arctic waters. In this regard, in 2014, in accordance with the instruction of the President of the Russian Federation (Pr-1530), it was recommended that oil and gas companies, including those implementing projects for the development of deposits on the Arctic continental shelf, develop and adopt biodiversity conservation programs. In addition, the President instructed the Government of the Russian Federation "in conjunction with scientific organizations and environmental public organizations in order to prevent and reduce the negative impact of economic and other activities on the environment in the Arctic zone of the Russian Federation, to develop a set of measures aimed at preserving biological diversity, including preventing death of wildlife objects in the event of oil and oil products spills."

Yamal LNG itself affects the environment, but it also changes the environment in ways that can affect companies' activities. As the first deputy director of the Yamal LNG project Dmitry Monakov says, "All plant facilities are built on permafrost. But scientists argue that the effects of climate change and increased permafrost temperatures could be disastrous for the peninsula." According to Monakov, this deposit is located on the territory of permafrost, and the permafrost goes 400 meters deep. This is a very poor soil for construction; if it melts, it will lead to serious accidents

involving the structures. "One of the challenges of the project is to preserve permafrost," Monakov states. "Therefore, all our facilities, including the LNG plant, stand on piles so that the heat from buildings and structures does not affect permafrost and stability is not disturbed. In total, the plant's facilities cover an area of approximately 2.5 km per 2 km." Now the project is developing in accordance with stringent environmental requirements. In many ways this is happening not only because of legislative norms, but also because of foreign project shareholders (French Total or China National Petroleum Corporation and the Silk Road Fund) who want their projects to be not only effective, but also "reputationally ecological."[7]

According to an OJSC press release from June 28, 2019, fieldwork to monitor the ecological status of the Ob Bay in the zone of influence of the Yamal LNG was scheduled to take place in Yamal in July-September. As part of implementing the Yamal LNG Biodiversity Conservation Program, adopted in accordance with the instructions of the President of the Russian Federation following the meeting on the efficient and safe development of the Arctic, the company developed a Comprehensive Program for Monitoring the Environmental Status of the Ob Bay in the Area of Influence of the Yamal LNG Project. The key objective of the program is to develop effective measures to control all the major environmental risks of the Yamal LNG project and scientifically-based evidence that the Project's economic activity does not harm the Ob Bay in the form of changes in hydrological characteristics, reduction of fish stocks, rare and protected species, and worsening of the environmental conditions for the local population and Indigenous People. Special attention is paid to the conservation of water resources, since The Ob River is one of the largest rivers in the world and one of the most important waterways of Russia. Monitoring of the population of polar bears, Arctic foxes, lemmings, and Red Book birds is carried out on an ongoing basis.

Indigenous Concerns

The share of Russia's population living in the Arctic zone is small; 1,6 percent (Fauzer, Lytkina and Smirnov 2017, 22). The predominant local population—the Nenets—are representatives of the ethnic group with Finno-Ugric roots, of whom more than half lead a traditional nomadic lifestyle. Nenets live permanently in the tundra and travel more than 2000

kilometers a year on reindeer sledges.

The direct impact of the Yamal LNG project on reindeer herding includes the loss of traditional pastureland to fill the needs of the project. This will result in the termination of access for reindeer herders to their traditional herding territory, as well as in the occurrence of various adverse factors affecting fodder plants and on the deer themselves. These include: sand dust from developed pits causes deer diseases and reduces their slaughter weight; industrial debris in the tundra leads to injury and diseases among reindeer; increased noise levels that disrupt the normal daily feeding and resting regime of the reindeer, leading to a reduction in the slaughter weight; among other impacts.[8] Threats to the human population include: increased stress, possible conflicts, reduced feelings of personal and public protection, and more frequent infectious diseases associated with a large number of visiting staff in the licensed area of the Project. Increased incidence of tuberculosis, HIV/AIDS, and other serious diseases among the local population is also possible.[9]

According to locals, there are also benefits from gas field development.[10] Thanks to it, there are mobile connections in the villages, and now in case of emergencies, locals can call an ambulance. This new industrial neighbor has also opened up prospects for business: meat and fish can be sold to gas-field workers. To promote good relations, Yamal LNG regularly informs the public about its current activities and upcoming work. Public hearings have become one of the tools for expressing the interests of Indigenous People, including the defense of their rights to protect the original habitat and their traditional economic activity. The participation of reindeer herders and fishermen in the discussion of the future design work of industrial enterprises in regions that nomads use seasonally helps to build a constructive dialogue to resolve the social and economic interests of the parties. For example, at the on-site meeting of businessmen with reindeer herders, it was decided to create deer crossings in the license area of the Yuzhno-Tambeyskoye gas field. The Yamal LNG company, with representatives of communities, deer farms, and the district administration, conducted a helicopter fly-around of the Yamal LNG license area and identified six places for deer crossings. Assistance was also provided to create a winter road for reindeer herders' personal transport.

The ability to engage in traditional activities plays a crucial role in the livelihoods of the local population. The list of traditional activities of the Indigenous Peoples in Yamal includes the following:

- Reindeer husbandry. Processing of reindeer husbandry products, including collection, harvesting and dressing of hides, ossified horns, antlers, endocrine glands, meat, offal.
- Fishing and marketing of aquatic biological resources.
- Breeding animals, processing and marketing of animal products.
- Commercial hunting, processing and sale of hunting products.
- Gathering (harvesting, processing and sale of food forest resources, collection of medicinal plants).
- Crafts and folk crafts (making utensils, implements, boats, sledges, other traditional vehicles, musical instruments, birch bark products, souvenirs from deer fur and hunting animals and birds, other materials, knitting nets, bone carving, wood carving, sewing national clothes and other types of crafts and crafts related to the processing of fur, leather, bone and other materials).
- Construction (manufacturing) of national traditional dwellings (plagues) and other buildings necessary for the implementation of traditional types of economic activity[11].

Sometimes Indigenous communities have no place for their reindeer because of the lack of pasture, which is increasingly occupied by mineral extraction operations in the natural territories traditionally used by relatively small populations of Indigenous People. In this case, the procedure of ethnological expertise can be especially interesting. In 2010, the Republic of Sakha (Yakutia) released a law "On Ethnological Expertise in Traditional Living and Traditional Economic Activities of the Indigenous Peoples of the North of the Republic of Sakha (Yakutia)." There is no such law in any of the subjects of the Russian Federation, but such practice exists in the Yamal-Nenets autonomous Okrugs, Khanty-Mansiysk autonomous Okrugs and the Sakhalin region.[12]

According to Grigory Petrovich Ledkov, the president of the Russian Association of Indigenous Minorities of the North (RAIPON),[13] there has been some progress made. "A system has already been established: conducting hearings and polls on the methods by which this process can be facilitated. When this cannot be done, there are compensation measures. There is a methodology for calculating losses. If a person cannot graze or fish at this place, then a contract is concluded with companies. The technique has been tested at the federal level for more than ten years. It is used in various subjects. Today we know that out of eight Arctic zones

in six, including on the Yamal Peninsula, approbation takes place at a practical level. There are positive results, dialogue is ongoing."

There are several non-governmental organizations (NGOs) whose activities are focused on or include defense of rights and preservation of culture of Indigenous Peoples of the YNAO. These are local organizations ("Yamal for its descendants," "United Yamal," the Russian Association of Indigenous Peoples of the North (RAIPON), and the Centre for Support of Indigenous Peoples of the North), as well as international NGOs such as the Association of World Reindeer Herders. However, in Russia the activity of Indigenous rights NGOs is significantly limited by state control on both the federal and regional level. Faced with these limitations, Indigenous NGOs have chosen different strategies to foster the protection of the interests of Indigenous communities of the YNAO, for example through building relations with the petroleum industry. Some of them prefer dialogue and trade-offs with the state and business interests, such as RAIPON or "Yamal to its descendants," while others, such as "United Yamal," that are more critical of oil and gas development in the YNAO and are thus less ready for compromises that will inevitably force unwanted changes on their traditional lifestyle."[14]

In some cases, business interventions have a positive effect on Indigenous Peoples. For example, the railway line leading to the Bovanenkovskoye gas field on the Yamal Peninsula is a convenient means of delivering goods for the region's nomads and transporting reindeer husbandry products to the markets. In addition, as part of the project to build a gas liquefaction plant and the Sabetta seaport, NOVATEK is financing an extensive construction program for the northernmost village of the Okrug, Se-Yakha. The construction of the seaport of Sabetta was preceded by public discussions about the project with Indigenous communities living on the Yamal Peninsula. Environmental experts and analysts conducted surveys, and held working meetings with communities in order to fulfill all the requirements of the Indigenous People of the region, and to resolve disputed issues. In particular, as a result of public hearings on port construction sites, the Ilebts community handed over to the company a complete list of sacred holy places. The community's demands are being honored.[15]

Notes

1. https://wwf.ru/upload/iblock/3bc/broshura_gas_eng_web.pdf, p.32
2. https://www.hfofreearctic.org/wp-content/uploads/2017/12/WWF-LNG-Russian-report-EN.pdf. p.35
3. https://bellona.org/news/fossil-fuels/2019-01-yamal-lng-project-built-on-a-shifting-foundation-of-climate-change
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10. https://inosmi.ru/social/20180604/242388700.html
11. http://map.rightsrf.ru/Karta_Yadro/prav_z_karta/sub_fed/uralsk_fed/yamalo-nenezk_okrug/dokument_yamalo-nenezk/dokument_4/dokument_4web.pdf
12. https://arcticyearbook.com/images/yearbook/2018/Scholarly_Papers/21_AY2018_Maximova.pdf, p.10.
13. https://news.rambler.ru/other/41422842/?utm_content=rnews&utm_medium=read_more&utm_source=copylink
14. https://www.imemo.ru/files/File/en/Projects/Blue-Action/BLUEACT-D5o20oCSN05-001.pdf, p.11.

A Chinese Perspective on Arctic Commercial Shipping, in Particular the Northern Sea Route

Zhao Long

As a result of global warming, Arctic sea ice has been melting rapidly, potentially easing access to natural resources and opening up new maritime routes in the region. According to the latest research, even if global average temperatures rise by less than two degrees Celsius above pre-industrial levels, the Arctic could see a sea ice-free summer at least once a decade.[1] These changes have increased global attention on potential uses, research, and peace and stability in the region. Among all new commercial opportunities, utilization of the Northeast Passage (NEP)—a maritime route along the Norwegian and Russian Arctic that is 37 percent shorter[2] than traditional routes through the Suez Canal—is one of the most dynamic topics.

China is defining itself as an important stakeholder in Arctic affairs and geographically a "Near-Arctic State," one of the continental States that are closest to the Arctic Circle,[3] and reflects the fact that China has many links with the changing region. China's funds, markets, and proficiency relating to infrastructure construction and resource exploitation are highly valued by some Arctic countries. Under the framework of jointly building a *Polar Silk Road* through developing the Arctic shipping routes, Chinese enterprises are pioneering participation in the construction of the Northern Sea Route (NSR)—a major part of the NEP—to connect the major production and consumer markets of Asia and Europe.

The Role of Chinese Companies in NSR Development

First, as a reliable operator of Arctic LNG transportation: Due to the unique environment of the Arctic region and ice conditions of the NSR, LNG carriers with icebreaking capacity are necessary for transportation. Yamal LNG is currently one of the largest energy projects operating in the Arctic region. It includes natural gas production, liquefaction and shipping, and is estimated to be producing 16.5 MTPA of LNG and up to 1.2 MTPA of gas condensate annually, which will be shipped to Asia-Pacific and European markets. According to the structure of Yamal LNG

shareholders—PAO NOVATEK (50.1 percent), Total (20 percent), CNPC (20 percent), and the remainder with the Silk Road Fund (9.9 percent)—around three million tons of LNG product is shipped to China per year. In order to ensure efficient and orderly transportation, Chinese shipping companies are actively involved in transportation operations. On July 19th 2018, the ice-breaking LNG carrier *Vladimir Rusanov*, owned by Mitsui OSK Lines (MOL) and COSCO SHIPPING Energy Transportation Co., Ltd., made its first NSR transit without ice-breaker support and delivered first direct LNG product from the Yamal LNG to PetroChina's Rudong terminal in the Jiangsu province of China.[4] Currently, COSCO SHIPPING Energy Transportation Co. Ltd. and its counterparts are operating 10 ships of various types for the Yamal LNG project.

Second, as an active investor into the energy transportation industry and infrastructure of the NSR: With this accelerated development, the overcapacity of transportation and shortage of LNG icebreakers are presenting major logistical challenges for Arctic LNG projects. For instance, through the first half of 2019, Yamal LNG produced nine million tons of LNG and 0.6 million tons of stable gas condensate, and all three LNG trains were running above nameplate capacity. But among LNG icebreaker/tanker ships commissioned to this project, fewer than 10 ships have been delivered and are currently in operation. It is expected that five new ships will be delivered by the end of this year. In response to growing transportation demands, NOVATEK has announced several short-term measures to reduce the sailing distance and increase utilization rates. These include ship-to-ship reloading in the Barents Sea in cooperation with the Norwegian shipping company Tschudi,[5] to reduce the sailing distance to Europe. Nonetheless, this temporary measure is unlikely to be sufficient to meet the growing demand of Yamal LNG's full nameplate output.

From a global perspective, Chinese shipping companies are an important player in the LNG transport shipbuilding industry. For instance, COSCO SHIPPING Energy Transportation Co., Ltd, the leading LNG carrier of China, has invested in 38 LNG vessels worldwide, including 26 LNG vessels currently in operation and 12 that are under construction. For the Arctic LNG project, Chinese companies have already built seven vessels for the construction of the Yamal LNG. COSCO SHIPPING Energy Transportation Co., Ltd has participated and invested in 18 of the 19 new LNG carriers ordered by Yamal LNG project, 14 of which were Arc7-class icebreaker LNG carriers.

In addition, in April this year NOVATEK signed a binding agreement

to enter the Arctic LNG 2 project with China National Oil and Gas Exploration and Development Company Limited (CNOCD), a wholly owned subsidiary of China National Petroleum Corporation. Two months later, as part of the Saint Petersburg International Economic Forum 2019 held in June, NOVATEK signed a Share Purchase Agreement with China National Offshore Oil Corporation (CNOOC Ltd.). Under these agreements, two Chinese companies will each acquire a 10 percent participation interest in the Arctic LNG 2 project. The Arctic LNG 2 project envisions the construction of three LNG trains at 6.6 million tons per annum each, based on the projected hydrocarbon resources of the *Utrenneye* field, which under the Russian classification hold reserves totaling 13,835 million barrels of oil equivalent.[6] With the construction of the Arctic LNG 2 project, the demand for construction and transportation of Arctic LNG projects is expected to continue to increase. It is foreseeable that Chinese shipping companies will continue to be important investors in Arctic LNG projects regarding ship leasing, logistics infrastructure, shipbuilding, etc.

Regarding ports and railways infrastructure, China is also a key partner in the implementation of relevant infrastructure projects, including the construction of the *Belkomur* railway line and the Arkhangelsk deep-water seaport.[7] In 2015, China Poly Group Corporation, a large central state-owned enterprise, signed a framework agreement with Russian Interregional JSC Belkomur on the railway-integrated project, which includes the construction of a new railway 1,252 km long. This line will link Central Russia to Arkhangelsk in the Arctic, and connect with a series of related ports and resource development projects along the railway. In addition, the Poly Group and COSCO Shipping are considering an investment of USD 550 million to construct a deep-water port in Arkhangelsk.[8] China Poly Group Corporation is reportedly set to invest $300 million in port facilities in Russia's Murmansk, a major transportation junction within the Arctic Circle, offering a positive signal that China may be taking a more active role in the development of the NSR from Northern Europe to East Asia via the Arctic.

Third, as a key partner to promote sustainable development of the NSR: During Russian President Vladimir V. Putin's state visit to China in June 2018, China and Russia issued a joint statement, which proposed "strengthening China-Russia sustainable development cooperation in the Arctic, including supporting cooperation among the relevant departments, institutions and enterprises in fields such as scientific research, joint implementation of transport infrastructure and energy projects, developing the potential for

the NSR, tourism and ecology."[9] For the first time, the statement defined "sustainable development" as part of the overall framework for China-Russia Arctic cooperation, which became another important consensus since the two countries stepped up efforts regarding Arctic cooperation in 2013.

The commercialization and internationalization of the NSR are major preconditions for Russia, which is making efforts to ensure that the NSR becomes a globally competitive transportation artery. The Chinese shipping company, COSCO Shipping Specialized Carriers Co., LTD., has been actively conducting transit voyages via the NSR. Since 2013, it has completed 22 voyages via the NSR/NEP, saving 93,350 nautical miles of sailing mileage and 7,332 hours of voyage time, reducing fuel consumption by 8,948 tons, and reducing carbon dioxide emissions by 27,833 tons. In 2018, it conducted eight transit voyages via the NSR, which constitutes nearly 30 percent of total transit voyages using this shipping route. Chinese shipping companies are continuing to conduct studies on these routes by strengthening hydrographic surveys with the aim to improve navigation, security and logistical capacities in Arctic shipping. These efforts enrich the overall best-practice goals of Chinese-Russian sustainable development cooperation in the Arctic.

Fourth, as an important participant in multilateral cooperation: Of the 150 Arctic transport infrastructure upgrades proposed by the Russian State Commission for Arctic Development, including oil and gas development projects with a total investment of nearly five trillion Russian rubles (approx. $79.7 billion), about four trillion rubles (approx. $63.7 billion) of investment will come from various financing channels other than the federal budget, especially from Asian countries.[10] This multilateral cooperation is an integral part of the NSR's development. China is a non-Arctic state, and cooperation is an effective means for China's participation in Arctic affairs. It requires establishing a relationship of multi-level, multi-dimensional and wide-ranging cooperation in this area.[11] Promoting bilateral and multilateral cooperation with Arctic state companies is a key approach for Chinese shipping companies to participate in Arctic LNG projects. In June 7th 2019, COSCO SHIPPING, NOVATEK, Sovcomflot, and Silk Road Fund signed an Agreement with respect to the Maritime Arctic Transport LLC (MarT) in St. Petersburg. These four parties intend to establish a long-term partnership providing for the joint development, financing, and implementation of year-round logistics arrangements for shipping from the Arctic zone of the Russian Federation to the Asia-Pacific region, as well as organizing transit cargo traffic along the NSR between Asia and Western

Europe. This new model of multilateral cooperation will also facilitate the rapid transformation of the NSR into a global and commercially effective international transportation corridor, optimizing international trade corridors and facilitating world connectivity and economic growth.

Major limitations for Commercial Navigation on the NSR

Operation of the NSR plays a prominent role in connecting China's northern ports with Europe economically. Therefore, China has further expanded the scope and degree of cooperation in developing Arctic passages, and has proposed building three key blue economic passages including one "leading up to Europe via the Arctic Ocean." With the theme of "sharing a blue space and developing the blue economy,"[12] China stresses promoting the normalization of commercial navigation on the NSR by multilateral participation. However, it should be noted that China is not an Arctic coastal state, and an important premise for conducting passage cooperation is respecting the relevant maritime management policies and development interests of Russia and other Arctic coastal states.[13] Meanwhile, due to the Arctic's unique geographical location and strategic significance, these geopolitical and security concerns, legal status, economic, and technical uncertainties are potential limitations for commercial navigation on the NSR.

The interference of geopolitical and security concerns

Arctic cooperation may devolve into another arena of geopolitical contest. As an Arctic coastal state, the United States is both a core member in Arctic affairs and an unavoidable player in sea route development. The increasingly chronic United States-Russia geopolitical tensions have also affected the two world powers' Arctic cooperation to varying degrees. Russia's accelerated military buildup in the Arctic area in recent years has created apprehension and resulted in heightened vigilance from the United States. U.S. Secretary of State Mike Pompeo's exaggerated accusations regarding Russia and China at the Arctic Council Ministerial Meeting in Rovaniemi undoubtedly increased tensions in the region. Pompeo called Russia's regulation of the NSR a provocative action that is part of a pattern of aggressive behavior. He also stated that China's civilian research presence in the Arctic would strengthen its military presence, including by

deploying submarines to the region as a deterrent against nuclear attacks. This statement is undoubtedly increasing tensions in the region.

Western media or scholars may distort the recent consensus reached by leaders of China and Russia on Arctic cooperation. Some have claimed that China's participation in Arctic shipping route development is intended to reinforce Russia's legal claim and actual control over the NSR and meddle in Arctic oil and gas exploitation. They may also try to make the case that China and Russia regard the NSR as a crucial maritime channel to contain the West, and intend to monopolize the development of Arctic shipping routes without taking responsibility to protect the Arctic environment and ecology.

The dilemma of the legal status of the NSR

On the one hand, Russia considers the NSR a historically shaped national transportation corridor, advocating for its complete control over navigation of foreign civil vessels and warships. In addition, an authorization navigation requirement applies to the waters of the NSR. According to the latest amendments of NSR Navigation Rules and Merchant Shipping Code, ROSATOM—the state-owned corporation—has to define a subordinate enterprise that is authorized to issue permits to sail via NRS. On the other hand, the United States considers the freedom of the seas is a top national priority, and has always opposed the sovereignty and jurisdictional claims of Russia over the NSR. The U.S. has declared that the NSR includes straits used for international navigation, and the regime of transit passage applies to passage through those straits.[14] However, when the NSR has been used by foreign states or companies through the mandatory authorization process, it may be interpreted as an indirect recognition of Russia's relevant sovereign claims over the NSR.

The balance between commercial utilization and preserving exclusive rights for the coastal state of the NSR

In recent years, Russia was aiming to increase the attractiveness of the NSR for foreign shipping companies, by simplifying application procedures for navigation permits and introducing preferential fees for icebreaking and icebreaking pilotage, thereby promoting the international commercialization process of the NSR. However, barriers at the practical level still exist. For example, amendments introduced into the Russian Merchant Shipping

Code suggest a number of activities that should be carried out exclusively with use of vessels navigating under the Russian state flag. These include pilotage, sanitary-related controls, protection and preservation of the marine environment in internal sea waters and/or in the Russian territorial sea; icebreaking and icebreaking pilotage in the water area of the NSR; marine transportation of oil, natural gas, gas condensate and coal produced in the territory of Russia and/or in the territory under its jurisdiction; and storage of oil and oil products, natural gas (including LNG), gas condensate and coal, if such storage is made on board of a vessel in the NSR water area.[15]

This amendment directly affects the ability of foreign shipping companies to participate in the previously stated sailing, operation and transportation via the NSR. In YAMAL LNG's case, Chinese shipping companies have been granted rights to participate in above-mentioned operations only by an intergovernmental agreement between China and Russia. This arrangement objectively affects the commercialization of the NSR and the efficiency of the construction of related infrastructure and energy projects.

Economic and technological uncertainties

Although the cargo volume transported via the NSR in 2018 set a new record of 20 million tons, the demand for transit passage connecting East Asia and Europe fluctuates. In 2013, the number of transits via the NSR was 71, but it dropped to 23 and 27 in 2017 and 2018, respectively.[16] Statistics show that cabotage shipping will continue to dominate shipping activities on the NSR in the years to come. The NSR can play a role as a transport corridor between ports along the Eurasian Arctic Coast and a transport corridor between the Eurasian Arctic and destinations and markets in the North Atlantic and Asian Pacific.

However, the future significance of international transit shipping on the NSR will depend on a number of prerequisites. These include Russia's own international trade demand, maintaining a sustainable cargo base, stabilizing transit demand and year-round operation, installing more advanced navigation, monitoring, and creating more robust marine search-and-rescue infrastructures and practices. In general, the commercial attractiveness of the NSR will be affected by improving navigation conditions on traditional routes, fluctuating international oil and gas prices, and developing renewable energy sources. Therefore, finding an appropriate

pace of construction and effectiveness of the NSR will require more in-depth scientific research and comprehensive discussion.

Conclusion

As a part of China's Arctic policy and ongoing Chinese-Russian sustainable development cooperation in the Arctic, China has become the one of the major partners involved in the comprehensive development of the NSR, facilitating connectivity and sustainable economic and social development of the Russian Arctic. Meanwhile, the role of Chinese companies in development projects is also becoming more important and diversified. However, due to the fragile natural environment and political, economic and social sensitivities of the Arctic, the economical attractiveness and year-round operation conditions of the NSR in the short-term are limited, and cabotage shipping will continue to dominate shipping activities on the NSR in the years to come. Furthermore, the significant concerns regarding the interference of global and regional geopolitics, the dilemma of the legal status and balance between commercial utilization and preserving exclusive rights of Russia over the NSR are creating potential challenges to the feasibility and efficiency of cooperation in development of the NSR. Finding the most effective way to balance all of these factors will require more in-depth scientific research, comprehensive assessments, and regular coordination and communication among all stakeholders.

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Harnessing Fourth Industrial Revolution Technologies for the Northern Sea Route

Sung-Woo Lee and Jisung Jo

Introduction

The economic benefits of the Northern Sea Route (NSR) have already been detailed in previous research (Liu and Kronbak 2010; Lee and Song 2013). In practice, the NSR saved thirteen days on international transit voyages from Asia (China) to Europe (Germany) compared to the Suez Canal in 2018.[1] However, commercialization of the NSR will be hindered by the unique situation of the Arctic, with its unpredictable and unstable ice conditions, harsh winter conditions, and seasonally increased costs of navigating (Lee and Jo 2018). More importantly, the NSR cannot be developed appropriately without considering a number of social values[2] involved with the sustainable development of this region.

Because of these issues and challenges in the Arctic, as Lee & Jo (2018) suggest, a gradual approach toward NSR commercialization is more desirable than a short-term strategy. In order to make this sea route viable, a system of cargo categorization should be created first. With this point in mind, this research plans to suggest a cargo-based four-step commercialization process for the NSR. Further, we would focus on the first step of NSR commercialization process, including the most promising freight categories, business models, and one case study regarding the use of autonomous vessels as a potential cost-saving technology.

To balance two seemingly incompatible values—economic feasibility and social values, 4th Industrial Revolution technology (4IR technology) will be applied to the business model for the first step. Research on the detailed strategies for the rest of other steps is left for future inquiries.

Commercialization Process for the NSR

In this research, we would like to suggest four steps for commercializing the NSR. In Figure IV.10, the first and second steps concern creating freight regimes in the Arctic offshore and Siberia, respectively. The third step

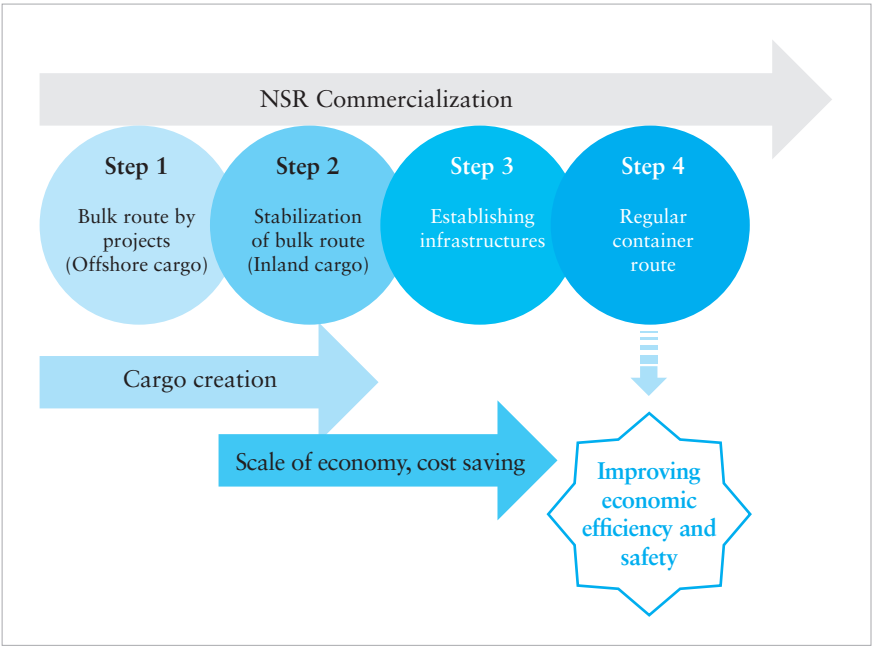


Figure IV.10 Commercialization process for the NSR

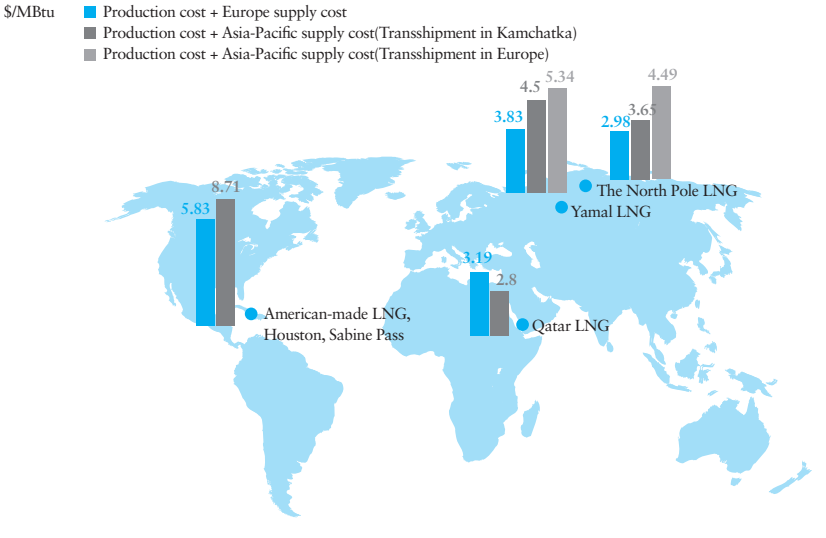
describes the necessity of physical and non-physical infrastructures in order to stimulate demand for various cargo transports. Lastly, based on sufficient demand, the ultimate commercialization of NSR could be achieved.

Potential Freight and Business Models: LNG and the Arctic LNG 2 Project

At the first step of commercialization, a possible offshore cargo could be oil and natural gas. Russia has the world's largest natural gas reserves and was the second largest producer of natural gas in 2016.[3] Russia's economy is mainly driven by their oil and gas exports, accounting for 46.5 percent of the Russia Federal budget revenue in 2018.[4] In order to enhance LNG supply capacity, the Russian government amended the LNG export law in 2013 to allow new state companies and private companies rights to export LNG in 2013.[5] In addition to Gazprom, the state-run gas venture, Rosneft—a state-owned oil company—and Novatek—a private gas company—can now also export LNG. The government has also been

focused on providing incentives in order to stimulate the energy industry, such as creating exemptions from export taxes for the Yamal project. With these efforts, the LNG production capacity could be expected to increase by 83 million tons per year by 2035, and the global market share could increase to 15 to 20 percent from four to five percent in 2018, according to the energy ministry's Alexander Gladkov.[6]

Among the LNG projects in Russia, the most visible one is the Arctic LNG 2 project. This project, led by Novatek, plans to develop in the Gydan Peninsula neighboring Yamal. Interestingly, Novatek will construct a Gravity Based System (GBS) based LNG trains. This structure could offer many advantages over conventional developments with regard to stability, robustness, cost, and generating environmental concerns.[7] According to KBR & KVERNER, the benefits of GBS LNG are especially relevant in the Arctic region. The structure limits the exposure of construction personnel to extreme weather, which can make business safer. Also, it lowers the environmental impact compared to land-based LNG plants by minimizing soil disturbance and containing little to no onshore infrastructure with no



Source: https://www.vedomosti.ru/business/articles/2018/01/25/748897-konkurirovat-s-novatekom (July 3, 2019)

Figure IV.11 Expenses comparison among Houston, Yamal, the Arctic LNG 2, and Qatar

shipping channels. The concrete material is very suitable for ice conditions and is designed to be ice-resistant. Lastly, this structure is much cheaper to build because it eliminates the need for both dredging and jetty construction and reduces labor costs typically incurred from accommodation camps and transportation. This is how the Arctic LNG 2 projects can save one third of construction expenses compared to Yamal projects[8].

With reduced construction costs, the expected total business investment cost would be around USD 10 billion, almost one third of the Yamal project's expenses (USD 27 billion). Also, liquefaction costs can be expected to come in at USD 2/MMBtu, which is even less than that of the Yamal project (USD 2.85/MMBtu). Vedomosti (2018) compared the total expenses of Arctic LNG 2 with Yamal, Houston (United States), and Qatar.[9]

This research considered production costs and transportation fees as the total costs of LNG. Three scenarios are featured: bound for Europe, bound for Asia-Pacific through a transshipment complex in Europe, and bound for Asia-Pacific through a transshipment complex in Kamchatka. Based on the plans of Novatek, Vedmosti forecast two LNG transshipment complexes for the winter season; one in Europe and the other in Kamchatka. The results show that the Arctic LNG 2 project is economically competitive even in the winter season.

As you can see in Figure IV.11, even under the most conservative estimates (LNG transshipment complex in Europe to Asia-Pacific area [Scenario 2]), the expense of Arctic LNG 2 is less than that of Yamal and Houston. Also, the Arctic LNG 2 project is the most compatible for Europe (Scenario 1) and is better than the Qatar LNG. Further, in the case of Qatar, we need to consider political risk as one of the costs. For example, the Qatar diplomatic crisis in 2017 induced anxiety among the Asian countries that depended extensively on Qatar LNG imports, and they had tried to find other supply chain solutions.

Though the economic feasibility of the Arctic LNG 2 project seems guaranteed, issues such as promoting safety and avoiding environmental impacts involving the NSR still remain. In this research, which seeks to find a way to balance economic value and other issues, we would like to consider 4IR technology. Specifically, an autonomous vessel could be used for LNG transportation; Offshore Support Vessels (OSV) and digital twin technology can be applied to upstream (or midstream) oil and gas. These technologies are already in use to improve efficiency and safety.

Utilization of Autonomous Vessels in Arctic LNG 2 Project

In this section, we would like to discuss the economic benefits of utilizing autonomous vessels in the Arctic LNG 2 project.

The IMO's Maritime Safety Committee defined four degrees of ship autonomy.[10] The first degree is a ship with automated processes and decision support. In this scenario, seafarers are on board to operate and control shipboard systems. Degree two is for remotely controlled ships with a seafarer on board. In this case, the ship is controlled and operated from another location. Seafarers are available on board to take control but are not necessary. The third degree is the remotely controlled ship without seafarers. And the last degree is a fully autonomous ship. The operating system of the ship is able to make decisions and determine actions by itself. In this research, we call degrees three and four an unmanned vessel. For this analysis of economic feasibility, degrees one and two (likely to available in the near future) are considered to minimize assumptions.

Economic feasibility of autonomous vessels

Table IV.2 shows the total expense of a traditional vessel—a degree one vessel and degree two vessel—over time. Since an autonomous vessel has not yet been commercialized, we simplify the cost structure and analyze the scenarios based on the data from Daewoo Shipbuilding & Marine Engineering. First of all, the capital expenditure (Capex), operational expenditure (Opex), and voyage-related expenditures (VoyEx)[11] are calculated based on an average of 173K LNGC and 13,000TEU container ship. We assumed that the ship owner purchases the vessel with 100 percent debt, twenty-year loan periods, and amortization with a 10 percent interest rate. Further, the concept of autonomous vessels adds automation systems to the traditional vessel. Thus the costs of degree one and two are only 10 percent and 15 percent greater than traditional one.

Also, for operation expenses, we assumed the number of crew members to be 25 for a traditional vessel, five for degree one, and two for degree two. The continuing education fee would be USD 25,000 each per year, and the salary per year would be USD 85,000. The fuel costs are assumed to be USD 7 million per year for a traditional vessel, USD 6.9 million for a degree one vessel, and USD 6.1 million for degree two. Since there is no consensus about what insurance and maintenance fees will be for various

Table IV.2 Scenarios of total expenses by vessel type (Units: million dollars USD)

Factors		1st year			20th year*		
		Traditional	Degree one	Degree two	Traditional	Degree one	Degree two
Capex		9.90	10.89	11.38	198.08	217.79	227.64
Opex	Salary	2.14	0.43	0.17	42.76	8.55	3.42
	Education	0.64	0.13	0.05	12.83	2.57	1.03
VoyEx	Fuel	7.70	6.93	6.16	153.95	138.56	123.16
Total		20.38	18.37	17.76	407.63	367.47	355.25
Differences with traditional			2.01	2.26		40.16	52.38

* cumulative values over 20 years
Source: re-estimate using data from Daewoo Shipbuilding & Marine Engineering Co., LTD.

vessels, we do not consider these in our estimates. Lastly, we estimated port charges and loading/unloading charges are the same value and are therefore not included in our analysis.

As you can see in Table IV.2, degrees one and two are economically better than traditional vessels. In the case of capital expenses, degree two is the highest at USD 17 million per month, followed by degree one and the traditional one. However, autonomous vessels far surpass traditional vessels in the area of operational expenses and voyage expenses. In short, the more autonomy, the higher the capital expense, but the lower the operation cost.

At the first year, the cost difference between the traditional one and degree one is USD 2 million. As time goes on, in the 20th year, it increases by USD 40 million. The main factor that affects this phenomenon is the number of seafarers on board. Thus, in the long run, the economic benefits of replacing people with advanced technology is larger than the capital costs.

Related regulations

Under the current International Maritime Organization (IMO)'s regulatory system, autonomous vessels do not have the authority to operate. The only experimental vessels that are allowed to operate are in some limited lake areas in Europe, including Norway, Denmark, and Finland. In Korea, which is surrounded by the sea on three sides, even an experimental autonomous ship is difficult to sail due to safety, security, and environmental issues.

However, the Maritime Safety Committee (MSC) of the IMO has

started to consider the matter of Maritime Autonomous Surface Ships (MASS) and agreed to embark on a "Regulatory Scoping Exercise" at 99th session in London from May 16-25, 2018. The purpose of this project was to assess the degree to which of the existing regulatory frameworks under its purview, such as SOLAS, Load lines, STCW, ColRegs, and Tonnage, may need to be reassessed in order to address MASS operation. For the next step, MSC will conduct meetings to determine the most appropriate way of addressing MASS operations, considering, among other things, the human element, technology, and operational factors. The results might be to amend existing instruments and/or to develop new instruments, such as the MASS code.[12]

Along with the development of technology, the business sector has been trying to achieve economic competitiveness, and urging policy makers to pave the regulatory path for new operating technologies. In the near future, it is expected that an international agreement for operating autonomous vessels will be established.

Utilization of further 4IR technologies in the Arctic LNG 2 project

The value chain of Arctic LNG 2 could be classified into upstream (exploration and production), midstream (processing and transportation), and downstream (marketing and sales).[13] The upstream sector includes exploration for potential underwater oil and gas fields, drilling, and operating the wells. Since Novatek has plans to construct GBS-based LNG trains, unmanned OSV would be useful to monitor and support various types of offshore work.

The midstream sector is about processing, transportation, and storage. In this section, degree one or two autonomous vessels could be deployed. As we investigate, the autonomous vessel is not only economically efficient but also relatively free from safety and environmental issues compared to traditional vessels. Further, for the maintenance of plants and vessels, we could deploy digital twin systems.

Conclusion

This study is valuable in order to identify the commercialization process of the NSR and find a way to balance two values—economic feasibility

and social values—in the unique circumstances of the Arctic. We suggest a cargo-based commercialization process of the NSR. The first and second steps are about generating freight for the NSR, and the third step regards the physical and non-physical infrastructure necessary to stimulate cargo creation. Lastly, based on established cargo routes and infrastructure, ultimately a viable, commercialized NSR could be achieved.

We also discuss the promising freight possibilities, business models, and one case study at the first step. The Arctic LNG 2 project is an economically compatible business model, considering the construction costs are one-third of the Yamal LNG project, and liquefaction costs can be expected to decline to USD 2/MMBtu. However, there are still unresolved safety and environmental issues related to the NSR. Thus, in this research, we suggest the 4IR technology to overcome and balance these issues. Then, we introduce the case study of autonomous vessel utilization in the Arctic LNG 2 project by examining costs using our best assumptions.

Though the 4IR technology has been developed quickly, the technology still needs to be commercialized and mature. With the growth of this industry, the analysis could be more concrete and accurate with minimized assumptions. Further, the case study assumes that the infrastructure suitable for the 4IR technology has been established in the Arctic. Luckily, the Russian government has a plan to modernize or reconstruct major ports. If the ports are designed for 4IR technology from the beginning, it would increase the competitiveness of these Arctic ports compared to other countries. For future studies, research on the remaining steps of the commercialization process needs to be conducted. It would also be interesting to investigate the consumer side of the suggested business model for a future research. Lastly, research regarding amending existing legal systems, including insurance and safety, is also needed for proper application of the 4IR technology.

Notes

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10. https://worldmaritimenews.com/archives/266898/imo-msc-identifies-4-degrees-of-ship-automation/ (4 July 2019)
11. Capex, Opex, and VoyEx represent three categories of business expenditures. In this case, Cpex is the costs for vessels that company will use for future. Opex is about the costs for a company to run its business operations. Thus, the salary, education fee, maintenance, and insurance would be included. Lastly, voyage related expenditure contain fuel, port charge, and loading/uploading charge.
12. Liberian Registry, *IMO MSC 99 Meeting Summary*, 2018.
13. https://moga.saoga.org.za/resources/oil-gas-value-chains (4 July 2019)

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Technological Challenges for Arctic Shipping

Rob Hindley

This paper addresses technical challenges for ship operations in ice, specifically Arctic navigation. In this context, Arctic navigation can be considered as either of two separate transportation models (Parliament. House of Lords 2015):

- Transit shipping, which is considered as utilisation of the Northern Sea Route (NSR) as an alternative to southerly transportation routes that utilise the Suez or Panama canal, linking Europe (or the Americas) with Asia.
- Destinational shipping, which is considered principally as a route to export natural resources from the Arctic to other (non-Arctic) markets, for example the Yamal LNG Project.

The technology used in these transportation models is similar, but is utilised in different ways in order to address specific challenges associated with the variability of the Arctic environment. This paper addresses recent technological advancements and anticipates challenges for future Arctic navigation. Although the economics of Arctic shipping are not discussed, the utilisation of support icebreakers to assist in ship transits is elaborated upon, as there is a certain influence on the technical specification of ships intended to operate independently as opposed to those which anticipate (or may require) icebreaker escort.

Challenges of Ice-going Ship Design

The main principle for all ice-going ship design is to minimise the amount of power required to break ice, while maintaining operational efficiency in an open seaway. The fundamental dichotomy in this approach is that efficient icebreaking requires a relatively flat, full bow shape, while the design for an efficient bow with maximum open-water efficiency and sea-keeping requires a much finer bow form and hull lines (Jones 2008). Higher engine powers are required for ships operating in ice because of the added friction between the ship and the ice and the momentum required to push

the ship through ice.

The Development of Efficient Ice-going Ships

The science of optimising a hull form for ice began in the 1970s with the introduction of model-scale ice basins (Aker Arctic 2019). Prior to this, effective hull forms were derived from full-scale, real-world experience. Development of new ship designs with hull forms refined in model scale enabled a significant reduction in the installed power of ice-going ships, increasing their efficiency and economy. The 1980s saw a large program of investment and development in icebreaker technology, both with respect to hull form shape and provision of auxiliary systems to aid icebreaking, primarily by reducing the friction between the ice and the ship (e.g. low friction paint, heeling tanks, air bubbler systems, water deluge systems) (Sodhi 1995). Reflecting on the progress and experimental programs in the 1980s, designers from 1990s onwards have had a wide range of hull form solutions to select from, depending on the operational profile of the ship; principally based on the amount of time the ship is intended to operate in ice versus the amount of time the ship is intended to operate in open water. As we shall discuss, there are trade-offs in optimizing for both conditions.

Development and Use of Azimuth Thrusters for Ice-going Ships

The 1990s saw a new approach to addressing the challenge of icebreaking vs. open water efficiency but focused on propulsion technology rather than hull form shape. A development from the observed effects of bow propellers was the concept of using directional thrust to enable a more efficient process for ice channel breaking. This resulted in the first installation of an *Azipod* (Azimuthing Podded Drive), in 1990 (Wilkman et al. 2006). (Figure

Figure IV.12 Azimuth thruster installed on an ice-going cargo ship

IV.12 illustrates an Azimuth thruster.)

The azimuth thruster provides 360 directional thrust. With the unit located at the stern of the ship, the ship can proceed in ice "stern first" with the stern (and the propeller) facing the oncoming ice. This is the "double acting" ship concept. The beneficial effects of stern-first operation from propeller- and hull-ice interactions include a more efficient icebreaking process and lower frictional resistance in ice (Hindley and Tustin 2008).

Ships designed for stern-first operation in ice can be optimized for heavier ice conditions going astern, enabling the bow of the ship to be optimized for open water (for example using a bulbous bow) or light ice conditions. A superior open water performance may be achieved when compared with a ship with an icebreaking bow, as well as a comparable ice-going vessel designed for bow-first operation in ice.

Considering the commentary provided above, it is to be noted that, as with the hull form developments in the 1980s, the successful use of azimuth thrusters has given Arctic ship designers another option to select from when considering how to optimise the ship for its operational profile.

Technological Challenges for Future Arctic Shipping Activities

Uncertainty of ice loading for large ships

Designers of ice-going ships have typically had to rely on semi-empirical methods. Their designs have been based on full-scale measurements of a ship's structure exposed to ice. Such measurements determine the size and dimensions of the ship's structure, appropriate to a given design load, that will prevent damage when operating in ice (Riska 2009). Although advances are being made in laboratory testing of ice failure, a significant reliance is still made on full-scale testing data. Classification societies publish rules that prescribe the strength of ships for navigating in ice, depending primarily on the thickness (and type) of ice (IACS 2016). These rules have been calibrated with the available data sets of full-scale ship operations in ice. However, data sets used for calibration are from small icebreakers and moderate-sized icebreaking cargo ships. For larger ships (for example those used to carry LNG from the Yamal peninsular) outside the calibration range, the rule formulations (for design ice pressures which are used to define ice loads) are necessarily conservative, to account for

uncertainty of ice loads on larger ships.

Recent developments in Arctic shipping have seen a considerable increase in the size of icebreaking cargo ships, primarily to serve natural resource export projects, where economies of scale encourage large ship operations in ice. As ship size increases, and as the Arctic is opened up to further projects that require ships to operate in thicker ice (or without icebreaker escort), the design loads increase exponentially due to uncertainty of ice loading. The consequence of this increasing design load is an increase in hull lightship weight due to higher steel weight and a reduction in overall hull cargo carrying capacity. This makes the ships less efficient to operate, less competitive with similar sized ships that are not strengthened for ice, and more expensive to build. In relatively thin thicknesses of ice the effect of ice load uncertainty is not pronounced. However, in relatively thick thicknesses of ice the effect of ice load uncertainty is significant. This uncertainty can be considered a technological hurdle that will require more full-scale testing of large ships in relatively thick ice.

Efficient ship structures for large Arctic ships

The structural design of Arctic ships has not changed significantly since the mid-1980s. Structural design practice has followed a "tried and tested" approach, primarily because of uncertainty regarding the ice load. However, as ship size has increased, the same approaches to dimensioning structure have been retained. As Arctic ships increase in size, and as the ice loads associated with operating these large ships in thicker ice remain relatively conservative, the applicability of current design practice is reaching its limit (Hindley et al. 2013). The nature of ice load is fundamentally different to that of wave loading, and approaches to the structural design of large Arctic ships have not been explored fully to allow for the most efficient arrangement and design to be adopted. The reduction in steel weight required for efficient Arctic ship design can be considered a function of two required advances in Arctic technology:

- Greater certainty of ice loads on larger ships; and
- Improvements in structural design for large Arctic ships

Improvements in structural design are considered to encompass not only new configurations but also use of advanced materials. Current Arctic

ship designs utilise high-strength steels up to the limit of what may be considered standard steel types used in the shipbuilding industry. In order to address the need to develop more efficient and lighter structures to resist ice loads for larger ships, new materials may have to be considered.

Competitive Arctic ships

For some ship operations it may make economic sense, voyage for voyage, to use the Arctic as a transit route (Niini and Tustin 2010). However, even though ice conditions have changed and are projected to change further, there remains only a small window in the summer months when open-water vessels (ships not strengthened for ice) can operate, either independently or with icebreaker escort. (Even in the most dramatic projections of future sea-ice loss this century, ice-free Artic sea routes will be limited to short, seasonal windows for operation.) Outside of this window, ships need an ice class, meaning extra power and a change in hull form shape, to enable operations in ice. Such vessels are not as fuel efficient as open water designs because a hull form shaped for icebreaking compromises the efficiency in open water. Experience with higher first year ice-class ships (Finnish-Swedish ice class IA and IA Super (Arc4/Arc5 for Russian Register)) that are seasonally trading in the Baltic Sea is that they are uncompetitive from an operating cost perspective when compared with modern open water ships that are optimized for fuel efficiency. Design for ship efficiency in open water with satisfactory ice-going performance is a significant challenge for ship designers to achieve an optimal balance of these two conflicting requirements.

At present there is a widening gap in performance between ice-going and open-water ships as energy efficiency improvement technologies are dominating the development of a new generation of open-water optimized ships. The drive for energy efficiency is expected to continue in the future and is also being further supported by regulation for the mitigation of greenhouse gas emissions from ships in the form of the IMO's EEDI Regulations (IMO 2011), such that the performance gap between open-water ships and ice-class ships will widen further.

The challenge facing owners and designers of ice-class ships is how to balance the conflicting design characteristics of open water efficiency (and reduced operating cost) with required ice-going performance (and increased operating cost). Table IV.3 shows a comparison for large oil

tankers (Aframax type) with different bow forms. The "vertical" bows have been recently introduced by shipyards as a direct response to the EEDI requirements and represent bow forms that are optimized for open water. In Table IV.3 all ship candidates are designed for an open water service speed of 14,5 knots. The following trends are apparent:

- The installed power decreases as the bow form becomes more vertical (efficient open water operation).
- The performance in a brash ice channel decreases with vertical bow angle, but is still satisfactory.
- The performance in other ice conditions worsens with more vertical bow angles.

This illustrates that although newer ships may be more efficient for operating in open water (because they are required to by the EEDI regulations) they are becoming less efficient in ice.

Table IV.3 Comparison of open water energy efficient bow forms on ice-going capability

	Bulbous bow (Pre EEDI)	Thinner bulb	Vertical	Extreme vertical
Installed power	100%	83%	78%	75%
0,25 Level ice	4 knots	1 knot	<1 knot	<1 knot
Brash ice channel	7.5 knots	7.0 knots	4.5 knots	4.0 knots
Frozen brash ice	4.3 knots	3.8 knots	0	0

If owners need an ice class for trading seasonally anywhere in the Arctic, the question remains: what are they going to do with their ships for the rest of the year? If they want to trade the whole year round, they may have to look at an extreme ice-breaking form and propulsion configuration that is only economical for particular projects or particular routes, where the ice-going performance can be optimized for exact conditions.

Operational models for Arctic transit

Operational efficiencies for Arctic cargo ships are influenced by the mode of operation selected: either escorted operations (with icebreaker assistance) or independent operation. A ship operating independently requires more installed power, and a more efficient icebreaking bow (or a

"double acting" ship concept) in similar ice conditions. The hull strength for independently operated ships is usually stronger (more steel weight). For the same ice conditions an escorted cargo ship can have a bow more optimised for open water and a lower installed power. Table IV.4 compares a range of ice class ships and their characteristics.

Table IV.4 Comparison of characteristics for escorted and independent ice-going cargo ships

Ice class	Non ice class / Ice class IC / Ice2	Arc4	Arc7
Expected operating mode	Escorted in ice	Escorted in harsh conditions	Independent operation
	Bulbous bow	Bulbous bow (ice-going type)	Moderate Icebreaking bow (double acting concept, performance figures in ahead / astern mode)
New-build cost	100%	110%	160-170%
Steel weight	100%	105-108%	130-150 %
Installed propulsion power	100%	120%	160-170%
Power at service speed in open water	100%	105-110%	170%
Speed in 0.6m level ice	Not achievable (2 knots in 0,4m)	5 knots	12 knots / 10 knots
Speed in 1.0m level ice	Not achievable	1 knot	7.5 knots / 7.5 knots
Speed in 1.5m level ice	Not achievable	Not achievable	3 knots / 5 knots
Escorted in channel (0.6m)	10 knots	10.5 knots	15 knots / 15 knots
Escorted in channel (1.0m)	6 knots	8 knots	12 knots / 14knots
Escorted in channel (1.5m)	Not achievable	3 knots	8 knots / 12 knots

Table IV.4 clearly illustrates that independently operating ships in ice come with a higher capital cost (CAPEX). Such ships are also less efficient in open water, which means that ships designed for independent operation in ice should primarily be always operating in ice: if they have to compete with ships designed for open-water routes they are too expensive and inefficient (OPEX).

The drawbacks of escorted operating modes include the cost of icebreaking support (which, for the Russian Northern Sea Route is a payable tariff, dependent on the number of sectors that the ship operate in

along the route) and the reliability of the icebreaking provision. Table IV.5 gives indicative prices for icebreaker support (Russian Federation 2014): To travel the extent of the Northern Sea Route (NSR) for a transit passage requires potentially 7 Zones of escort, depending on the conditions. To travel from Yamal East requires passage through 1 Zone; to travel West from Yamal requires passage through 6 Zones.

Table IV.5 Icebreaker tariffs in USD for YamalMax size vessel (~128,800 GT)

	Summer-Autumn		Winter-Spring	
Ice class	1 Zone	6+ Zones	1 Zone	6+ Zones
No	$553,000	$1,106,000	Not Allowed	Not Allowed
Ice2	$360,000	$719,000	Not Allowed	Not Allowed
Arc4	$277,000	$553,000	$691,000	$1,382,000
Arc7	$271,000	$542,000	$677,000	$1,354,000

Table IV.5 indicates that utilisation of icebreaker escort is not inexpensive (the tariff also varies and is therefore difficult to utilise for long-term planning). However, the real drawback is the predictability of icebreaker support: The Federal State Unitary Enterprise (FSUE), *Atomflot*, handles icebreaker support on the Northern Sea Route. There are (only) four nuclear icebreakers in active operation currently. In addition, three universal nuclear icebreakers are currently under construction, the commissioning of which is expected in 2020, 2021 and 2022 respectively (Belkin 2019). The current dearth of icebreakers plying the NSR means there are possibilities for long waiting times and convoy operations (convoys, where typically up to five cargo ships are supported by one icebreaker, are limited by the capability of the least efficient ship in the convoy). Furthermore, the need for icebreaker assistance is dependent on actual conditions: seasonal and inter-seasonal variations in ice mean that some years a ship may require more icebreaker assistance. As a consequence, to ensure reliability, the majority of destinational shipping projects in the Arctic are served by dedicated icebreaking ships that are capable of operating independently of icebreakers.

In summary, it can be noted that for destinational shipping projects, independent operation is to be anticipated as the most reliable means of transportation. In these cases the ships are a dedicated type, optimised for the conditions expected along the export route. For seasonal (and occasional) shipping projects, including transit across the NSR or NWP,

there is more of a case for utilising available icebreaker escort to extent the operational season and to focus more on the compromise of designing a hull form that is more optimal in open water for the rest of the ship's trading year.

Conclusions

Technological challenges remain for efficient Arctic shipping, with a significant build and operating cost premium associated with the current generation Arctic capable ships intended for independent operation. A combination of uncertainty of ice loads and the development of much larger Arctic ship designs may lead to Arctic ships that are uneconomic in operation with reduced cargo-carrying capacity and excessive hull structural steel weights. Dedicated, or specialized, ships designed for year-round ice-going navigation, even those enhanced only for seasonal navigation in light ice conditions, are uncompetitive in build, and operation costs are higher when compared with open water shipping. As such, knowledge of the intended transportation model is essential when considering the expected operational mode for shipping: independent, ice capable ships are a reliable means of transportation, but their higher CAPEX must be offset by long-term transportation contracts. Taken outside of these dedicated routes, such ships are uncompetitive in the open market, as their OPEX costs are significantly higher than ships optimized to operate in ice-free waters.

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PART V

PREVENTING AND CONTROLLING POLLUTION IN THE ARCTIC

Persistent Organic Pollutants and Mercury in the Arctic

David Stone

The term "persistent organic pollutants" (POPs) refers to substances that share the following set of diagnostic physical, chemical, biological, and toxicological properties:

- They resist chemical, physical and biological degradation, particularly in cold polar environments.
- At warm environmental temperatures they evaporate into the atmosphere where they remain until their volatility properties (fugacity) favors condensation to the earth's surface at high latitudes (known as cold trapping).
- They accumulate in organisms. Each trophic level passes much of its lifetime contaminant burden to the trophic level above, progressively moving them to the top trophic level (biomagnification). Arctic marine ecosystems contain seven or more trophic levels. Therefore, biomagnification can be easily in excess of 25 million times from phytoplankton to top predator.
- They exhibit both acute and chronic toxicity. Acute effects occur soon after exposure but chronic effects occur after months or years and are much more difficult to assess. However, chronic exposure studies at levels comparable to those seen in Arctic marine ecosystems have detected effects that include reproductive and developmental disruption, immune suppression, liver and thyroid activity changes, neurotoxicity, and non-mutagenic tumor promotion. Longitudinal prospective studies targeting child cohorts in some Arctic communities have detected cognitive effects that remain until at least teenage years but which appear to be related to only a short prenatal window of POPs exposure.

Mercury: Mercury (Hg) is the only heavy metal of circumpolar concern in the Arctic. It is a natural substance undergoing geochemical cycling that has been significantly disrupted since the mid-19th century. The main anthropogenic sources (in decreasing order of significance) are fossil fuel combustion (particularly coal for electrical power generation), metal, gold,

and cement production, the chlor-alkali industry and waste incineration.

Arctic geochemical cycling of mercury is complex and the following summary is greatly simplified. (For example, I have ignored phenomena such as atmospheric mercury depletion events, or AMDEs.) Atmospheric transport from lower latitudes is the dominant source of new Arctic mercury, mostly in the form of gaseous elemental mercury (GEM), also known as (Hg0). Atmospheric residence time is about two years, allowing rapid global long-range transport. Hg0 must undergo atmospheric transformations into particulate inorganic mercury (HgII) before it can be deposited to Arctic land and water bodies (marine and fresh water). The annual net amount of mercury being added to the Arctic is between 80 and 140 tonnes. Microbiological processes play the major role in transforming some HgII into several different forms of methylated mercury (MeHg), which are biologically active and enter the Arctic food web. The ultimate fate of most Arctic MeHg is to be stored in sinks such as lake and ocean sediments, soils, ice (including permafrost), or be transported south by ocean currents and the atmosphere.

MeHg biomagnifies. The longer the food chain, the higher the concentrations in top level Arctic carnivores. More than 90 percent of the MeHg burden originates from anthropogenic sources. MeHg is concentrated in different organs and tissues according to predator species. The main storage depot in marine mammals and birds is the liver but in polar bears and other terrestrial mammals it is the kidney. Some MeHg excretion can occur via feces and urine. MeHg can also be lost through incorporation into hair (mammals) or feathers and lipid rich eggs (birds). This is a route not available to hairless toothed whales, which may explain the high levels of MeHg found in their muscles and brains.

MeHg can cross the blood brain barrier, resulting in neurological and muscle disruption in upper trophic level fish and fish-eating mammals (including humans). By the 1990s a number of Arctic species such as the polar bear exhibited MeHg levels that approach or exceed no observable effects levels. The human blood guideline level in the United States is 5.8 micrograms per litre. This level was commonly being exceeded in the 1990s by women of childbearing age in Arctic coastal communities in Canada (52-76 percent) and Greenland (more than 80 percent).

In the late 1990s, longitudinal cohort studies were initiated to investigate whether long-term chronic exposure to MeHg in children is associated with observable effects in Arctic Québec and the Faroe

Islands. Subtle effects detected in the Faroese cohort at age seven were still detectable at age 14 and were statistically related to pre-natal but not post-natal MeHg exposure. The effects, which included deficits in language, attention, memory and auditory and visual brain processing, were generally similar to those found in the Arctic Québec cohort.

Global and Regional Agreements that Address POPs and Mercury

Both the Stockholm and Minamata Conventions (below) acknowledge the special vulnerability of the Arctic ecosystem and its Indigenous Peoples to these substances.

The Stockholm Convention is a global multilateral environmental agreement (MEA) exclusively concerned with the control, use, and disposal of POPs. It entered into force in 2004 and had 182 Parties in June 2019. The Conference of the Parties (COP) is able to place a chemical in one or more "action annexes." They are:

Annex A: Parties must take measures to eliminate all production and use of the chemicals listed (e.g. the pesticide Chlordane).

Annex B specifies conditions for limited party specific and chemical specific exemptions for substances listed in Annex A or B (e.g. DDT).

Annex C aims to reduce those POPs emissions formed and released unintentionally from anthropogenic activity (e.g. Polychlorinated dibenzo-p-dioxins).

The Convention includes a mechanism for Parties to prepare proposals to add new substances to the action annexes (Article 8). Such proposals are reviewed by the POPs Review Committee, which evaluates the properties of the proposed new substance in relation to screening criteria used to identify a POP (Annex D of the Convention). Environmental monitoring data is used to indicate substance potential for persistence, bioaccumulation, and long-range transport, even if they were not predicted from the physical and chemical nature of the substance. As of September 2019, 29 POPs are controlled under the Convention and there are five substances under review for possible inclusion.

Article 16 of the Convention requires the COP to periodically review the Convention's effectiveness in reducing POP levels in the environment. This is enabled by assessment of environmental trends determined by the Global POPs Monitoring Programme.

The Minamata Convention is exclusively concerned with mercury. It entered into force in 2017 and had 110 Parties in June 2019. A life cycle approach to global controls is taken, focusing on source sectors such as coal fired power generation, construction, electronics, wastes, mining, and the health and cosmetics industries. It includes control measures on air emissions, a phase-out of existing mines, measures to reduce emissions from small-scale gold mining, artisanal industries, and trade. There will be a phase-down on the use of dental amalgam. Article 3 prohibits "primary mercury mining not being conducted prior to entry into force of the Convention for that Party, and requires the phase-out within 15 years of any primary mining that was being conducted within a Party's territory at the date of entry into force for it." Article 19 includes a clause promoting the "development and implementation of strategies to identify and protect populations at risk, particularly vulnerable populations, including science-based health guidelines, targets for mercury exposure reduction, and public education." Article 21 requires parties to report to the COP on measures taken to implement the Convention and their effectiveness to meet the Convention's objectives.

In 2016 Giang and Selin published an assessment method to evaluate potential benefits to the United States from the Minamata Convention in comparison to benefits derived from only domestic actions. The method was framed as economic gains from avoiding mercury-related adverse health endpoints. The authors projected that "cumulative lifetime benefits from the Minamata Convention for individuals affected by 2050 are $339 billion (2005 USD), with a range from $1.4 billion to $575 billion in our sensitivity scenarios. Projected Minamata benefits are more than twice those projected from the domestic policy." This economic range is similar to estimates made for Europe by Bellanger et al. (2013).

Other agreements and an initiative that impinge on POPs and mercury include the:

- Convention on Long-Range Transboundary Air Pollution (CLRTAP) Aarhus Protocols on POPs and Heavy Metals. The CLRTAP Convention is regional, and includes Europe, North America, and all states of the former Soviet Union. The protocols entered into force in 2001 and 2003, respectively. With the advent of the Stockholm Convention the POPs Protocol is now largely of historical significance;
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. It is a global MEA;

- Rotterdam Convention is a global MEA which promotes shared responsibilities in relation to importation of hazardous chemicals by prior informed consent;
- Strategic Approach to International Chemicals Management (SAICM).

The Present State of Scientific Understanding of Long-range Pollutants in the Arctic

POPs: The POPs initially listed in the Stockholm Convention (legacy POPs) are generally showing a declining trend in Arctic biotic and abiotic media, probably as a result of controls put in place both before and after entry into force. They were replaced in commerce by substances with similar utility, some of which are brominated rather than chlorinated POPs. Many of these substances are now also in the Stockholm annexes.

A new generation of substances termed "Chemicals of Emerging Arctic Concern" (CEAC) is now being detected that are not predicted from the criteria for long-range transport presented in Annex D of the Stockholm Convention. AMAP 2017 combined the output of screening studies by Muir and Howard 2006; Howard and Muir 2010; Scheringer et al. 2012; Rorije et al. 2011. AMAP 2017 reported that the combined output of these studies suggested that about 1200 substances have the potential for long-range transport to the Arctic. Without perfecting proactive management tools (see below), monitoring in remote areas such as the Arctic is the only way to detect and assess Arctic risk.

Mercury: Global anthropogenic atmospheric mercury emissions in 2015 were 20 percent higher than estimated for 2010. A continuing trend exists for lower emissions in North America and the European Union (achieved primarily from controls on coal generation electrical power facilities), offset by increases in Asian emissions (that account for 49 percent of the global total). Artisanal and small-scale gold mining are the major contributor to emissions from South America and Sub-Saharan Africa. In other regions, energy production and industrial emissions predominate.

Recent work by Zhang et al. (2016) indicates that air pollution control technology aimed at reducing SO_2 and NOx emissions from power stations has also altered the speciation spectrum of emitted Hg. This has contributed to lower than anticipated global anthropogenic emissions and subsequent deposition. This benefit will likely be lost with the introduction

in the United States of reduced emission standards aimed to regenerate coal-fueled power stations (Schartup et al. 2019).

Increasing trends in mercury levels continue in some Arctic marine species such as ringed seals in North America and polar bears in west Greenland. In east Greenland and the European Arctic, mercury levels in the same species have generally decreased. These opposing spatial trends may reflect changing emissions noted above, shifting bioavailability of mercury or climate induced ecosystem functioning. Mercury levels in various species of freshwater fish across Sweden, Finland, Norway, and the Kola Peninsula have declined, in step with the declining atmospheric mercury trend over Northern Europe.

From the mid- to late-19th century, mercury concentrations in the atmosphere and in aquatic biota increased in tandem until about the 1970s-80s. However, over the last two to three decades, a mismatch between aquatic biotic and atmospheric mercury trends has become apparent. This may be due to large inventories of mercury in soil and the ocean that are subject to different geochemical, climate, and ecosystem processes. Levels of methylmercury in biota were historically linked to the availability of Hg0 and HgII. Now there is sufficent mercury in the environment that mercury levels in biota may instead be limited by methylation and demethylation rates as well as other factors influencing biomagnification. This creates variable outcomes from place to place. Atmospheric mercury trends may now have little short-term influence on biotic mercury trends in many aquatic ecosystems. Globally, climate change is believed to be among the most important contributors to the mismatch, but in the Arctic the rapid decline in sea ice has also altered Hg partitioning, methylation and demethylation rates, promoted changes in primary productivity, and shifted food web structures.

Across the Arctic and in the Faroe Islands, human Hg body-burden levels remain elevated but have dropped in most areas over the past two decades, probably as a result of local dietary advisories, changing consumption patterns, and reduced emissions in Europe and North America.

The Arctic Council's Response to Long-range Pollution

The Arctic Monitoring and Assessment Programme (AMAP) was established to monitor and assess all aspects of the Arctic environment

(including human health) and to report its findings and assessments to the Arctic Council. The Arctic Council then may then request appropriate international bodies to address issues identified by AMAP. In this way the LRTAP Convention protocols on POPs and heavy metals (including mercury), the Stockholm Convention on POPs, and the Minamata Convention on mercury were born (English 2013; Stone 2015; Platjouw et al. 2018; and Selin 2018).

Possible Future Directions for Strengthening Global and Regional Responses

POPs:

- The long-term need is for national and international chemical management to move away from the present reactive approach where we wait for substances to move to and accumulate in cold environments before considering action. It could be replaced by a proactive mechanism where chemicals with predicted properties concerning chronic toxicity, propensity for long-range transport with cold trapping, and bioaccumulation are not allowed into commerce. Such an approach is possible, as demonstrated by REACH, which entered into force in the EU in 2007 (T. Öberg 2012). To comply, companies must screen, identify and manage the risks linked to the substances they manufacture and market in the EU and provide data on high-volume production chemicals. If the risks cannot be managed, authorities can restrict the use of substances.
- Spatial and temporal trends data for CEACs using common methodologies should be widely available in the Arctic. Lack of information on biological effects precludes evaluation of potential Arctic impacts and impedes development of proactive management.
- Microplastics have been shown to adsorb POPs from sea-water (Mato et al 2001; and Teuten et al. 2009). Dimethyl sulfide (DMS) is a chemical produced by phytoplankton and passed onto grazing zooplankton and higher trophic level organisms. It is also adsorbed onto the surface of plastics in seawater. Many pelagic seabirds use DMS to locate their prey. They may therefore mistake a microplastic particle for prey, thus providing a mechanism for the transfer of POPs to higher trophic levels (Savoca 2016). This illustrates the urgent need

for a comprehensive ecosystem-based investigation of microplastics.
- The impacts of climate change on transport and fate of CEACs and POPs urgently need attention.

Mercury: Top priorities include:
- Greatly improved understanding of the impact of Arctic climate change on the geochemical and biological cycling of mercury between environmental compartments is urgently required as illustrated by the following: 1) Changes in ecosystem structure induced independently by climate change and overfishing have the potential to pull in different directions in mid-latitude marine situations (Schartup et al. 2019); 2) Thawing permafrost releases about 200 micrograms of mercury per square kilometer per year, an amount that exceeds present Arctic deposition; 3) The relationships between mercury exposure and cardiovascular disease need to be better understood and the present cohort studies should be continued.
- All countries should be encouraged to ratify the Minamata Convention.

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The Polar Code and Vessel Source Pollution Prevention and Control in the Arctic

Drummond Fraser

The Polar Code takes into consideration the unique hazards and risks encountered by ships operating in the Arctic and Antarctic through the establishment of heightened international rules for safety and pollution prevention. Whereas prior to its entry into force on 1 January 2017, ships operating in the ice-infested waters of the Beaufort Sea or the remote reaches of the Ross Sea were generally subject to the same international standards as ships on voyages at lower latitudes, the Polar Code addresses the recognized need to provide a mandatory framework for operations beyond existing International Maritime Organization (IMO) instruments like the SOLAS and MARPOL Conventions.[1]

Notwithstanding the rights of Arctic Coastal States to establish their own domestic rules under the *United Nations Convention on the Law of the Sea* (UNCLOS), including the provisions of Article 234, which allow for the adoption and enforcement of non-discriminatory rules for the prevention of pollution from ships in ice-covered areas,[2] the Polar Code marks a significant advancement in the international regime related to ship design, equipment carriage, operations, seafarer training, and protection of the marine environment. Indeed, the absence of mandatory international measures up until this point resulted in a patchwork of individual Arctic state rules and an otherwise inconsistent regulatory environment for ships transiting the region.

The Polar Code is comprised of four separate sections. Part I-A covers mandatory safety measures, and is inclusive of 12 unique chapters on topics ranging from ship stability to voyage planning. Part I-B contains recommendatory safety measures designed to complement these 12 chapters. Part II-A addresses pollution prevention and contains four unique chapters that correspond with MARPOL Annex I (Prevention of Pollution by Oil); Annex II (Control of Pollution by Noxious Liquid Substances in Bulk); Annex IV (Prevention of Pollution by Sewage from Ships); and Annex V (Prevention of Pollution by Garbage from Ships). Similarly, Part II-B contains recommended pollution prevention measures in alignment with these four MARPOL annexes, though is also inclusive of guidance on ballast water management and biofouling.

There is no uniform or one-size-fits-all application of the Polar Code; rather, where, when, and how a ship intends to operate determines applicable requirements. As a baseline, the safety provisions of the Polar Code apply to all ships certified in accordance with SOLAS Chapter I operating in polar waters; in other words, cargo ships above 500 GT and passenger ships carrying more than 12 passengers. Beyond this, individual regulations are applied pursuant to a range of ship-specific criteria that include date of construction, tonnage, and the extent to which a ship will be exposed to low temperatures, ice conditions, or high latitudes.

Inasmuch as the suite of individual chapters in Parts I-A and I-B contribute to increased levels of safety, these same provisions also have a corollary in pollution prevention. Indeed, the relationship between the two is acknowledged in the Polar Code's preamble, clearly noting that steps taken to reduce the probability of an accident will also be of benefit to the marine environment.[3]

Like the safety requirements, the pollution prevention requirements apply on the basis of geography, though as a baseline are tailored according to MARPOL Annex I, II, IV and V certification. Specifically, the Polar Code's pollution-prevention measures apply to all ships concerning the release of oil, garbage, and those certified to carry noxious liquid substances. For the management of sewage, however, the Polar Code is applicable to ships of 400 GT and above and those certified to carry more than 15 passengers.

Prevention of Pollution by Oil

Concerning the prevention of pollution by oil, the Polar Code sets out both operational and structural requirements. Operationally, all discharges into the water column of oil or oily mixtures are completely prohibited, essentially aligning Arctic standards with measures already in place in the Antarctic area,[4] and thereby prohibiting trace amounts of discharge (e.g. 15 ppm) otherwise permitted under MARPOL.

Structurally, all ships built on or after 1 January 2017 that have been designed for operations in thin-to-medium first-year ice, and with an aggregate oil fuel capacity of less than 600 m^3, require the separation of oil fuel tanks, oil cargo tanks, and sludge tanks from the outer shell. In addition, smaller oil tankers of less than 5,000 tonnes, built on or after

1 January 2017, and also having been designed for operations in thin-to-medium first-year ice, require cargo tanks to be constructed with added protection. In doing so, the structural provisions currently applicable under MARPOL Annex I to larger ships are essentially extended down to ships of all sizes operating within the Polar Regions.

Control of Pollution by Noxious Liquid Substances in Bulk

Under MARPOL Annex II, ships (e.g. chemical tankers) are permitted the controlled discharge of certain noxious liquid substance (NLS) residues, as well as the discharge of ballast water or tank washings that contain NLS. The Polar Code completely prohibits these discharges in the Arctic Region only, as regulations already exist prohibiting similar discharges in the Antarctic area.

In addition, ships built on or after 1 January 2017 designed for operations in thin-to-medium first-year ice that under the *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk* (IBC Code) carry NLS deemed to present "sufficiently severe"[5] environmental and safety risks, now require approval by their Administration to carry these substances. "Sufficiently severe" is third in rank in the IBC Code behind "severe" and "appreciably severe," and unlike these other two categories is not subject to prescribed location requirements for cargo tanks. Accordingly, the goal of this provision is to limit the carriage of NLS against the outside side shell of ships.

Prevention of Pollution by Sewage from Ships

The Polar Code sets out operational requirements allowing for the release of sewage only when done in accordance with specific provisions, including at a range of specified distances based upon whether the sewage has been ground and disinfected or not. While MARPOL Annex IV establishes discharge distances from land, the Polar Code's primary difference is that it also considers discharge distances from ice.

For ships operating with an approved sewage treatment plant, discharge distances are less prescriptive, though must still occur as far as practicable from the ice shelf, fast ice, and areas exceeding 1/10th ice

concentration. All ships designed for operation in thin-to-medium first-year ice and all passenger ships constructed on or after 1 January 2017 must have an approved sewage treatment plant onboard otherwise sewage has to be retained. These rules are similar to those currently applicable under MARPOL Annex IV for passenger ships operating in Special Areas.

Prevention of Pollution by Garbage from Ships

The Polar Code also addresses the disposal of garbage generated onboard ships. As MARPOL Annex V already covers the Antarctic area and sets out strict discharge provisions, the Polar Code's regulations on garbage are primarily limited to the Arctic, making it a de facto Special Area. Therefore, throughout polar waters the discharge of garbage is prohibited, with the exception of food wastes, provided these wastes are ground and comminuted and disposed of at set distances from land and ice.

Pollution Prevention and Control beyond the Polar Code

For its deserved praise as a precautionary risk-based tool to mitigate the impact of ship operations, the Polar Code is not exhaustive in its treatment of the range of pollutants negatively impacting the Arctic and Antarctic environment, including greywater, heavy fuel oil (HFO), ballast water, and air emissions.

The omission of these waste streams from the Polar Code is certainly not a reflection on their level of importance, but rather in part an explicit decision on behalf of the IMO to focus already wide-ranging and challenging discussions in the interest of reaching consensus on a final product within a reasonable time frame. Moreover, with the exception of the management of HFO, which has only recently been taken up by the IMO in the context of the Arctic, ballast water and air emissions are being addressed globally, while greywater continues to remain untouched by binding international convention.

Heavy fuel oil use and carriage for use as fuel

The risks associated with heavy fuel oil (HFO) in polar environments

are well documented.[6] HFO has a toxicity greater than that of light- and medium-grade fuel oils, as well as a thicker viscosity, meaning it takes longer to degrade within the water column, particularly where lower temperatures prevail. Moreover, burning HFO results in elevated levels of atmospheric NOx, SOx, and black carbon compared to alternate or more distillate fuel types, and the accumulation of black carbon on snow and ice exacerbates the ice-albedo relationship, resulting in the absorption of solar energy.[7]

The first international effort to mandatorily address HFO use by ships in Polar Regions came to fruition in 2011 with the IMO amending MARPOL Annex I to ban its use via the creation of a Special Area in the Antarctic. Since then, there has been a growing campaign to enact similar prohibitions within the Arctic, beginning with the Polar Code's recommended guidance encouraging ships operating in the Arctic to adhere to this Antarctic prohibition, and culminating with a proposal to ultimately ban HFO for use and carriage for use as fuel in the Arctic, approved at the 72nd Session of the Marine Environment Protection Committee (MEPC) in April 2018.

While this decision marked a significant milestone in a multi-year effort to have the issue formally adopted as a new output for MEPC, the practical details of a ban continue to be analyzed and further considered by the IMO's Sub-Committee on Pollution Prevention and Response (PPR). In February 2019 PPR agreed on a draft methodology for conducting an impact assessment of the proposed ban on HFO. Contracting Governments now have the opportunity to conduct individual assessments on how such a ban would impact domestic communities and industries. It is anticipated that the review of these assessments will help shape or substantiate the specifics of the proposed ban, including timelines for entry into force, the impact of the upcoming 1 January 2020 sulphur limit in fuel oil, and whether certain exemptions or carve-outs should be considered.

Emissions of black carbon from international shipping

Black carbon is dark particulate matter capable of absorbing sunlight and melting snow and ice. Black carbon is also a short-lived climate pollutant, meaning that unlike other air emissions, it remains in the atmosphere for only brief periods of time. Since 2011 the IMO has been considering various ways to reduce emissions of black carbon from

international shipping, including the extent to which Arctic-specific action should be undertaken vis-à-vis more global work on air pollution pursuant to MARPOL Annex VI. Ultimately, the path agreed to by the MEPC was regional in scope, focusing only on the Arctic, and consisted of three primary deliverables: i) the development of a working definition for black carbon; ii) the consideration of various measurement methods for black carbon; and iii) an investigation into appropriate control measures for black carbon.[8] While this roadmap took a significant amount of time to complete and spanned multiple Committee and Sub-Committee sessions as well as Working and Correspondence Groups, all three deliverables are now complete,[9] culminating with the recent identification of 41 possible black carbon control measures.[10] From this inventory of measures, many were considered to be implementable within the next five years and included: i) the use of alternate fuel (e.g. LNG, distillate, biodiesel); ii) incorporating exhaust gas treatment technologies (e.g. diesel particulate filters, scrubbers); iii) improvements in engine and propulsion system design (e.g. hybrid/energy storage); iv) improvements in energy efficiency and design; v) various operational measures (e.g. slow steaming, trim optimization), and; vii) the introduction of international regulatory measures (e.g. developing a black carbon emission standard).

Non-binding Measures for Pollution Prevention and Control in the Arctic

The Working Group on the Protection of the Arctic Marine Environment (PAME) has a mandate to address policy issues in support of the conservation and sustainable use of the Arctic's marine and coastal areas.[11] One of six working groups of the Arctic Council, PAME provides a forum for international cooperation on a wide-range of Arctic marine environmental issues that generally fall within the themes of offshore oil and gas, marine protected areas, the ecosystem approach to management, and shipping. Regarding the latter, in 2009 the Arctic Council (under the guidance of PAME) released the Arctic Marine Shipping Assessment (AMSA). This landmark report considers both current and future shipping activity throughout the entire circum-Arctic Region, the impacts of this activity on Arctic residents and the marine environment, and the infrastructure needs in support of shipping. The results of this

comprehensive assessment are summarized into 17 key findings or recommendations that cover enhancements to marine safety, pollution prevention and marine environmental protection, and building marine infrastructure. Ten years out, AMSA's legacy still looms large, with the majority of PAME's shipping-related work linked in some degree to these various recommendations.

Unlike the IMO, which by virtue of its status as a specialized agency of the United Nations charged with the establishment of globally binding rules for ship safety and pollution prevention, the Arctic Council is instead a regional intergovernmental forum that addresses Arctic-specific issues through studies or measures that are recommendatory or voluntary in nature. These significant differences aside, in its capacity as a policy making body, the Arctic Council can and has played a role complementary to that of the IMO insofar as it can address certain issues of shared interest in an arguably more swift and focused way.

In this spirit, much of PAME's shipping-related work is now selected according to its current or potential relationship to outputs under consideration by the IMO's various committees and subcommittees. Such a strategy helps to ensure that often limited resources are better aligned in support of projects and initiatives with a more tangible benefit, and that regional support amongst Arctic nations can be galvanized behind issues in advance of more formal negotiations at the IMO. To that end, what follows is a sample of recent shipping-related projects being coordinated by PAME that can be considered mutually beneficial to work undertaken by the IMO.

Heavy fuel oil in the Arctic

PAME has overseen the release of a significant volume of work on the risks associated with the use and carriage of HFO by ships in the Arctic. Beginning in 2010, PAME initiated the first of several reports that identified trends in HFO consumption across the Arctic Region, analyzed various risks associated with a spill, and put forward for consideration strategies for minimizing these risks. Summaries and key findings from these reports were submitted to MEPC in 2018 on behalf of the eight Arctic states in an effort to inform ongoing discussions on a proposed ban.[12] PAME's work on this topic remains ongoing, with two dedicated projects on the 2019-2021 biennial work plan exploring the toxicity and fate of light and intermediate fuels oils in cold water, and an analysis of the extent of onshore use of HFO

by coastal Arctic communities.

Regional reception facilities planning guide

PAME has also coordinated the submission by the eight Arctic states of a Regional Reception Facilities Planning Guide for the Arctic. Recognizing that the Arctic presents unique challenges to shipping, PAME has long considered that the establishment of bilateral or multilateral regional arrangements for waste disposal—similar to arrangements currently in place for small island developing states—would be complementary to the Polar Code and a useful alternative to ensure that ships do not have an incentive to discharge waste.[13] While the development of guidance material was adopted by the IMO, the establishment of regional arrangements requires amendments to the appropriate MARPOL annexes, and to that end the eight Arctic states has since submitted a proposal to MEPC for a new output to make these amendments.[14]

Arctic shipping best practice information forum

PAME established the Arctic Shipping Best Practice Information Forum (the Forum) [15] in 2017 and its accompanying web portal a year later. The goal of the Forum is to promote effective implementation of the Polar Code and to raise awareness of its provisions amongst all those involved in or potentially affected by Arctic marine operations.

To accomplish this goal, the Forum facilitates the exchange of information and best practices among members on topics that include hydrography, crew training, traditional and local knowledge, and marine environmental protection. This information is then intended to be used by maritime administrations and Recognized Organizations alike in the issuance of Polar Ship Certificates, in conducting Operational Assessments, as well as in the development of Polar Water Operational Manuals—three key information-dependent components of the Polar Code.

Conclusions

In recent years the relationship between the Arctic Council and the IMO has only grown closer, evidenced perhaps most clearly though the

accreditation of the IMO as an official Arctic Council Observer during the 2019 Ministerial meeting in Rovaniemi, Finland. Moreover, while the primacy of the IMO as the global rules setting body for ships is well acknowledged and respected across the Arctic Council, previous attitudes quick to peg even the slightest non-policy shipping discussion as squarely within the remit of the IMO are gradually being replaced with more cooperative or symbiotic ones. This evolution has directly contributed to progress on the initiatives noted above, and portends positively regarding in-development PAME initiatives concerns underwater noise, marine litter, and black carbon.

Notes

1. Resolution MSC.385(94) and Resolution MEPC.264(68).
2. *United Nations Convention on the Law of the Sea*, A.234 Ice Covered Areas.
3. Resolution MSC.385(94).
4. Resolution MEPC.42(30).
5. *International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk* (IBC Code), 2.1.2.3.
6. Arctic Council, *Arctic Marine Shipping Assessment 2009 Report*, April 2009.
7. MEPC 71/16/4.
8. MEPC 62/24.
9. MEPC 68/21, PPR 5/24 and PPR 6/20/Add.1.
10. PPR 6/20/Add.1.
11. https://www.pame.is/index.php/shortcode/about-us.
12. MEPC 72/INF.14.
13. MEPC 72/16.
14. MEPC 74/14/2.
15. MSC 101/INF.18.

Plastic Pollution and Microplastics in the Arctic

Sherry P. Broder

Introduction

Plastic pollution and microplastics are a recognized international environmental crisis and the most common form of marine debris. It is a significant problem in the Arctic as well. Marine litter, including microplastics, has been found across the Arctic marine environment: along the shoreline, in sea ice, along the sea surface and subsurface waters, throughout the water column, on the seafloor, and embedded in its sediments.[1] Plastics result in harmful effects on marine life and biodiversity and produce negative impacts on human health as well.

Global industrial production of plastic began in the 1950s. The annual production of plastics increased nearly 200-fold to 381 million tons in 2015.[2] Plastic pollution in the oceans comes from human activities on land and at sea. But most of the ocean-based prevalence of primary microplastics —estimated to be as high as 98%—is generated from land-based activities.[3]

It is estimated that more than 150 million ton of plastics have accumulated in the world's oceans since the onset of industrial production in the 1950s. Marine plastic litter consists of macro-plastic items (greater than 5mm in size) or microplastics (less than 5mm in size). These include plastic fragments and plastics manufactured at that tiny size (pellets or microbeads), as well as from small pieces of plastic that are remnants of larger plastic debris that has been degraded by sun and weathering. Tiny microplastics can be pervasive, smaller than a grain of sand, and can be invisible to the naked eye. Microplastics tend to be more difficult to detect than larger plastic debris, yet clearly have an environmental impact. Microplastics are a major concern because organisms that are food sources at lower levels of the food web can easily consume these micro-sized particles, causing bio-accumulation in higher-level consumer organisms. Ingestion may be direct or indirect via trophic transfer (up the food web).[4]

Ingestion of plastic has become common among fish, seabirds, sea turtles, marine mammals, and marine organisms. This consumption can lead to accumulation within the stomachs of animals, sometimes leading to malnourishment and starvation. Scientists are warning that absorption and

ingestion of plastic debris by fish, bivalves and other seafood is particularly concerning for humans. Marine creatures can also become entangled in or ingest plastic debris, causing suffocation, starvation, and drowning. Fish species and barnacles can colonize floating plastic by following or attaching to the debris as it drifts long distances, which may likely increase the spread of invasive species.

Recent studies have shown that humans are ingesting, inhaling and absorbing plastics through direct skin contact, but the effect on human health is still poorly understood. It is not just the plastics themselves that create risks, but also the chemical additives in plastics and the pesticides and other chemicals that can attach to plastics.

How Serious of a Problem is Plastic and Microplastic in the Arctic?

PAME's Desktop Study on Marine Litter, including Microplastics in the Arctic (2019) ("The Arctic Study") was prepared for submission at the 11th Arctic Council Ministerial Meeting held in Rovaniemi, Finland, May 7, 2019.[5] The study found that knowledge about the extent of plastic pollution in the Arctic is limited. Estimates of plastic masses and particles in most of the world's ocean basins are available, but not for the Arctic. Although more data and studies are needed, the Arctic Study is an important collection of data regarding the extent and distribution of plastic and microplastics in the entire Arctic region.[6]

The Arctic Study found that the literature documents that marine litter, including microplastics, can be carried into the Arctic by ocean currents and circulation systems, and is also being carried by wind and deposited by snow. Plastic can come from very distant sources. Often plastics enter the oceans from coastlines, rivers, tides, and marine sources. Discarded materials, lost items, and dumping in the fishing industry are major sources as well. Microplastics have been found in sea ice.[7]

In the Arctic, marine litter, including microplastics, is not only a result of debris input originating from activities within the Arctic seas or its coastal areas, but is also linked to input arriving from inland areas through rivers, air currents and from distant oceanic areas through global oceanic circulation. The proportion of locally originated litter and microplastics versus those of distant origin is not known. Further studies

are recommended to establish where plastic originates and how it then travels to the Arctic.[8]

The Arctic Study reviewed data collected for areas where human activities are concentrated, such as the Barents, Norwegian, and Bering Seas, and for specific species that had already been the subject of research (e.g. seabirds such as the northern fulmar, shearwater, petrel, and puffin).[9] Marine litter is a major threat to Arctic marine life and birds because many species can ingest or become entangled in debris.

There is little if any data available for the Central Arctic and the coastal areas around of Siberia, Arctic Alaska, mainland Canada, and the Canadian Arctic Archipelago. However, from the available analysis of macro-litter data compiled on Arctic beaches or accumulating on the seafloor, most (50-100%) is from fishing activity, such as nets, floats, and other debris.[10]

Based on a review of the scientific studies and literature, the Arctic Study found that marine litter, including microplastics, is found in all Arctic marine environments, including beaches, ocean surface waters, the water column and the deep-sea floor.[11] It has been generally agreed that subtropical ocean zones have higher concentrations of marine debris due to prevailing currents and winds. Microplastics have been found in increasing amounts in all the oceans and are present in locations far from human populations, such as the deepest levels of the ocean and in frozen Arctic sea ice. The Arctic Study pointed to a report on data for a decade at the northern station of the Hausgarten Observatory, east of Svalbard, which found a 20-fold increase in marine litter in the Arctic in the last decade.[12]

Once deposited in the ocean, plastic can be dispersed by both wind and ocean currents and can be carried into the Arctic Ocean. The quantities of marine debris at the sea surface in the Arctic have been found to be relatively low in comparison to other ocean basins. Although for the most part the Arctic does not have the gyres of plastics that accumulate in the subtropical oceans, a recent study established that the pole-ward branch of thermohaline circulation brought floating plastic debris from the North Atlantic into the Greenland and Barents seas. The study projects that this area is a "single, dominant high-accumulation zone for floating plastic debris and accumulation" and a "dead end for the plastic conveyor belt."[13]

The first Arctic circumpolar study of microplastics in 2013 indicated particularly abundant plastic debris in the Greenland and Barents Seas. It estimated that 95% of the plastic load in the Arctic Ocean is found in this northeastern Atlantic sector of the Arctic Ocean. The nature of the particle

shapes and sizes pointed to a distant source region, confirming long-term model simulations that suggest that these microplastics were transported via the Atlantic branch of the thermohaline circulation.[14]

A recent study on global patterns of marine micro-particles demonstrated that concentrations were higher in the Arctic Basin than all other ocean basins in the world[15] Once reaching the Arctic, plastic particles can be incorporated into sea ice, which acts as a sink and transport vehicle of microplastics in the Arctic.[16]

Plastics, including microplastics, have washed ashore on some of the world's most remote beaches, uninhabited by humans. This includes the Arctic as well as other places throughout the world.[17] Microplastics are being found in the deep ocean. A recent study in Monterey Bay, California found that the farther from the shore the samples were collected, the more microplastics they contained, suggesting that these microplastics are not just coming from the California coast. Submerged microplastics were found to be widely distributed, from the surface to thousands of feet deep.[18] Plastics were found in every creature studied.[19] Another study[20] that examined the digestive tracts of whales, seals, and dolphins along the British coast found microplastics in every animal studied.

What Global Responses and Initiatives have been Taken to Address Plastic Pollution?

Global initiatives to reduce or eliminate the consumption of single-use plastic have been gaining momentum.

Recognizing plastic pollution as a serious and rapidly growing problem that requires an urgent global response, the UN Environment Assembly (UNEA) has been working to increase global action on ocean plastics.

At the UNEA-3 meeting in December 2017, States formed an Ad-Hoc Open-Ended Expert Group (AHOEEG) to present options to combat marine plastic litter and microplastics. It was recognized that there was a need to increase coherence, coordination, and synergies among existing mechanisms, and to enhance cooperation and governance with a view to better address the challenges posed by marine litter and microplastics at the local, national, regional, and global levels.[21]

AHOEEG met twice in 2018, reporting back options for continued work that included calls for systemic full life-cycle management to

address the problem of plastic pollution and to seek solutions for both the prevention and elimination of all kinds of marine litter. Multiple approaches to strengthening coordination and governance were also discussed, with many countries across all regions calling for a legally binding agreement on marine litter and microplastics. These might include binding global reduction targets, caps on production and consumption of plastics, and requirements for loss prevention, collection, and recycling of all plastics.[22]

At the UNEA-4 meeting in March 2019, States considered but did not adopt several resolutions proposing to improve international action to halt plastic pollution. Norway, Japan, and Sri Lanka sought to strengthen international cooperation and coordination on marine plastic litter and microplastics, including through a possible new legally binding agreement. India proposed the phase-out of single-use plastics worldwide.

During the UNEA sessions, compromise texts were agreed upon with regard to Addressing Single-use Plastic Products Pollution (UNEP/EA.4/L.10) and Marine Plastic Litter and Microplastics (UNEP/EA.4/L.7). The COW approved and forwarded both resolutions to UNEA-4. Japan, Norway, and Sri Lanka welcomed adoption of the resolution, with Japan stressing the role of UNEP in implementing the marine plastic litter resolution and the need to collaborate with the Basel Convention and International Maritime Organization. India and the EU expressed disappointment that the single-use plastics resolution was weakened.

Significantly, the mandate of AHOEEG was extended to continue its work and to provide a report on its progress on response options at UNEA-5 in February 2021. The extension of this mandate is important and continues to provide a mechanism to consider a future legally binding agreement.[23]

The Basel and Stockholm[24] Conventions have a direct impact on the plastic waste trade, on standards for the management of plastic waste, and on the toxic exposure inherent in the plastic pollution crisis for large and microscopic plastics on the land and in the marine environment. The UNEA had invited the Basel Convention "to increase their action to prevent and reduce marine litter and microplastics and their harmful effects," and the Basel, Rotterdam, and Stockholm Convention (BRS) Secretariat has participated in and presented at UNEA's AHOEEG.

Norway proposed amendments to the Basel Convention annexes to bring the global trade in dirty, hard-to-recycle, or unrecyclable plastics

under the scope of the Basel Convention and it was adopted at the COP in May 2019.[25]

MARPOL already prohibits the dumping or discharging of plastics into the sea. The International Maritime Organization ("IMO") Marine Environment Protection Committee 73 ("MEPC") adopted an action plan at its October 2018 meeting to reduce marine plastic litter. It seeks to enhance existing regulations and introduce new supporting measures to reduce marine plastic litter from ships. The Action Plan provides IMO with a mechanism to identify specific outcomes, and actions to achieve these outcomes, in a way that contains concrete measures and details.[26] These issues were considered by MEPC 74 at the May 2019 meeting and further follow up to identify all international regulatory instruments and best practices associated with the issue of marine plastic litter from ships. This review provided an analysis of the existing body of knowledge on marine plastic litter from all sea-based sources, and an assessment of data gaps. These and other issues will be the subject of a report at the next meeting.[27]

The UN 2030 Agenda on Sustainable Development includes 17 goals, each with specific targets. Goal 14 (Life Below Water) includes a target to, "by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution."[28]

Regions, countries, cities and businesses have been responding by restricting the consumption and sale of single-use plastics, such as plastic straws, bags, cups, bottles, utensils, and others.

How Has Plastic Pollution been Addressed on the Regional Level including through the Arctic Council?

In 1998, the Arctic Council adopted the Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-Based Activities (RPA). The RPA was to "take action individually and jointly, which will lead to the prevention, reduction, control and elimination of pollution in the Arctic marine environment and the protection of its marine habitat." In 2004, the Arctic Council adopted the Arctic Marine Strategic Plan. Soon thereafter, the Arctic Council Ministers requested PAME to review and update the RPA. PAME amended the RPA and released the updated version on 29 April 2009.

The Arctic Marine Strategic Plan 2015-2025 (AMSP), a framework to guide the Arctic Council's actions to protect Arctic marine and coastal ecosystems, also addresses marine litter through various Strategic Actions. For example, the Strategic Plan calls for improving the understanding of cumulative impacts on marine ecosystems from human activity-induced stressors, including local and long-range transported pollution from land- and sea-based sources and marine litter (Strategic Action 7.1.3).

The 2017 Fairbanks Declaration of the Arctic Council Ministerial (Fairbanks, Alaska) noted "with concern the increasing accumulation of marine debris in the Arctic, its effects on the environment and its impacts on Arctic communities, and decide[d] to assess the scope of the problem and contribute to its prevention and reduction, and also to continue efforts to address growing concerns relating to the increasing levels of microplastics in the Arctic and potential effects on ecosystems and human health."

The PAME working group met Sept 9-12, 2019 in Reykjavik, Iceland. This was the second PAME meeting of 2019, and the first to be held under the Icelandic Chairmanship of the Arctic Council (2019-21). Iceland has unequivocally stated:

> *During its Chairmanship, Iceland will highlight plastic pollution in the Arctic marine environment, drawing on the findings of the first desktop study on marine litter in the Arctic. The Arctic Council will work on the development of a Regional Action Plan to reduce marine litter, including micro-plastics, along with other efforts to monitor and limit its impacts.* [29]

PAME initiated a serious effort to develop a Regional Action Plan on Marine litter which is planned to be submitted to the April 2021 meeting of the Arctic Council. The project includes leadership and collaboration by Canada, the Kingdom of Denmark, Finland, Iceland, Norway, Sweden, USA, AIA and OSPAR and other working groups.[30] The development of a Regional Action Plan (RAP) on Marine Litter in the Arctic builds upon the Phase I Project "Desktop Study on Marine Litter including Micro-plastics in the Arctic (2019)" among other things.[31]

What Future Directions are being Considered or Should be Considered for Preventing and Controlling Plastic Pollution in the Arctic?

The Arctic Study made the following major findings, which provided a sea lane for the way forward at the present time:

> *The presence of marine litter, including microplastics, in the Arctic Ocean is connected to human activities occurring within and outside the Arctic region. Despite the lack of estimates of marine litter input linked to different human activities occurring in the Arctic region, the analysis of existing coastal and seafloor litter data identifies fisheries-related activities as a major source in the Arctic. Other sea-based activities like aquaculture, passenger and goods shipping, and oil and gas exploration activities constitute additional sea-based sources. As for land-based sources, coastal litter data points to deficient waste and wastewater management systems in some coastal Arctic communities as an important localized source of marine litter.*[32]

The Arctic Study recommended that: (1) a formal consistent monitoring programs that covers all the sources, pathways, compartments and impacts of this environmental challenge be established; and (2) more studies and data collection should be supported that would provide more comprehensive knowledge on Arctic-specific marine litter sources and pathways and its effects on the Arctic marine environment.

In addressing the problem of plastics in the Arctic, getting agreement on the facts is extremely important. Defining universal terms of reference assists in the accessibility and usefulness of the data collected. The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), established in 1969, advises the UN system on scientific aspects of marine environmental protection. GESAMP's March 2019 report on Guidelines for the Monitoring and Assessment of Plastic Litter proposes to standardize definitions and methods of collecting data, which should will facilitate data sharing and protect the integrity of the data.

The Arctic Study concluded that it was critical to envision and develop a Regional Action Plan (RAP) on marine litter in the Arctic. The RAP could be modified over time as more information becomes available and could include a monitoring program or utilize a parallel monitoring program to

collect baseline data and allow for evaluation of future scientific and policy directions.[33]

Plastics will remain a matter of great concern, not only in the Arctic, but also for the environment worldwide and for human health.

Notes

1. PAME, *Desktop Study on Marine Litter including Microplastics in the Arctic* (Iceland: PAME International Secretariat, 2019), 75. https://www.pame.is/images/03_Projects/Arctic_Marine_Pollution/Litter/Desktop_study/Desktop_Study_on_marine_litter.pdf. ("The Arctic Study"). This paper is based in part on the collection of literature, data and conclusions in this report.
2. Hannah Ritchie and Max Roser, *Our World in Data* (Sept. 2018). https://ourworldindata.org/plastic-pollution
3. Microfibers from clothing and textiles are a major source of microplastics in our oceans. Due to their minute size, these fibers pass through wastewater treatment plants and end up in the ocean. The International Union for Conservation of Nature (IUCN) estimates that 35% of all primary plastics that end up in our oceans have come from textiles, making it the largest source of microplastics, followed by those which come from the degradation and abrasion of car tires (28%). Secondary microplastics are mostly from mismanaged waste. Julien Boucher, Damien Friot, *Primary microplastics in the oceans : a global evaluation of sources*, IUCN, 2017. https://portals.iucn.org/library/node/46622
4. The trophic level of an organism is the position it occupies in a food chain.
5. The Arctic Study.
6. Ibid. The authors point out that this compilation is not "comprehensive." Ibid., 3.
7. Ibid.
8. Ibid.
9. Ibid., 89. Table 3.1. Plastic ingested by seabirds in the Arctic; Table 3.2. Average plastic ingestion by seabirds in the Arctic (species and foraging strategies).
10. Ibid.
11. Ibid., 77-100. Table 2.1. Abundance of macroplastics observed on beaches; Table 2.2. Abundance of plastic observed in sea ice and seawater; Table 2.3. Abundance of litter observed on seafloor; Table 2.4 Abundance of microplastics observed in sediments.

12. M. B. Tekman, T. Krumpen and M. Bergmann, "Marine litter on deep Arctic seafloor continues to increase and spreads to the North at the Hausgarten observatory," *Deep Sea Research Part I: Oceanographic Research Papers* 120 (2017): 88-99.
13. A. Cózar, E. Martí, C. M. Duarte, J. García-de-Lomas, E. Van Sebille, T. J. Ballatore, V. M. Eguíluz, J. I. González-Gordillo, M. L. Pedrotti, and F. Echevarría, "The Arctic Ocean as a 104 dead end for floating plastics in the North Atlantic branch of the Thermohaline Circulation," *Science advances*, 3(4) (2017): e1600582.
14. Ibid.
15. A. P. W. Barrows, S. E. Cathey, and C. W. Petersen, "Marine environment microfiber contamination: Global patterns and the diversity of microparticle origins," *Environ Pollut*. 237 (Jun 2018): 275-284. Doi: 10.1016. https://www.ncbi.nlm.nih.gov/pubmed/29494921
16. Peeken, I., S. Primpke, B. Beyer, J. Gutermann, C. Katlein, T. Krumpen, M. Bergmann, L. Hehemann and G. Gerdts, "Arctic sea ice is an important temporal sink and means of transport for microplastic," *Nature Communications* 9 (1505), 2018. DOI: 10.1038/s41467-018-03825-5
17. In 2018, lava from Hawaii's Kilauea volcano reached the ocean and new sand was created for a new beach, Pohoiki. Samples of the new sand contain hundreds of tiny pieces of plastic, although the area had been basically untouched by humans. The study compared Pohoiki samples with those taken from two other neighboring beaches that were not formed by volcanoes, Pohoiki has about 30 to 50 percent of the plastic older nearby beaches have. Most of the plastic on Pohoiki were microfibers. https://www.nationalgeographic.com/environment/2019/05/newborn-hawaii-beach-already-polluted-with-plastic/
18. *Microplastics Have Invaded The Deep Ocean—And The Food Chain*, June 6, 2019 9:01 AM ET, Heard on All Things Considered, Christopher Joyce 2010. [See also, Nature Scientific Reports.] Although this study was limited to local samples, Dr. Robison pointed out that 70 years of manufacturing plastic may have created a global ocean problem. "We humans are constantly coming up with marvelous ideas that eventually turn around and bite us on the butt." https://www.npr.org/sections/thesalt/2019/06/06/729419975/microplastics-have-invaded-the-deep-ocean-and-the-food-chain
19. Ibid. Marine biologist Dr. Anela Choy, Scripps Institution of Oceanography, San Diego and was lead scientist on the study. She reported, "We found microplastics everywhere we looked, in every sample and specimen we looked at." Dr. Choy also explained further that the deep ocean is like a giant feeding trough. "It's filled with animals," she says, "and they're not only moving up and down in the water column every day, forming the biggest migration on the planet, but they're

also feasting upon one another." For example, the deep ocean is filled with sea creatures like larvaceans that filter tiny organisms out of the water. They're the size of tadpoles, but they're called "giant larvaceans" because they build a yard-wide bubble of mucus around themselves—"snot houses," Choy calls them. The mucus captures floating plankton. But it also captures plastic. "We found small plastic pieces in every single larvacean that we examined from different depths across the water column," Choy says. Another filter feeder, the red crab, also contained plastic pieces—every one the researchers caught.

20. https://www.nature.com/articles/s41598-018-37428-3
21. UNEP/EA.3/Res.7 Marine Litter and Microplastics
22. UNEP/AHEG/2018/1/INF/3 (8 May 2018)
23. UNEP/EA.4/Res.6. Marine plastic litter and microplastics. "Decides to extend until its fifth session the mandate of the ad hoc open-ended expert group on marine litter and microplastics established by its resolution 3/7, and requests the expert group, building on its previous work, to: (a) Take stock of existing activities and action by governments, regional and global instruments, international organizations, the private sector, non-governmental organizations and other relevant contributors to reduce marine plastic litter and microplastics with the aim of the long-term elimination of discharge into the oceans; (b) Identify technical and financial resources or mechanisms for supporting countries in addressing marine plastic litter and microplastics; (c) Encourage partnerships that undertake activities such as the development of source inventories, the improvement of waste management, awareness-raising and the promotion of innovation in relation to the prevention of marine litter, including plastic litter and microplastics; Invites the Environment Management Group to engage in and contribute to the work of the ad hoc open-ended expert group on marine litter and microplastics by providing, inter alia, mapping of all United Nations agencies, programmes, initiatives and other sources of expertise relating to marine litter, including plastic litter and microplastics."
24. Many chemicals listed in the Stockholm Convention are toxic chemical additives to plastics (including flame retardants and plastic softeners). All plastics contain toxic additives. A great many more additives are present in plastic, but not revealed by manufacturers. The Stockholm Convention regulates persistent organic pollutants (POPs)—some of which can be found in plastic and which present deeper concerns if recycled, dumped, or incinerated.
25. Because the U.S. is not a party to the Convention, the amendments adopted act as an export ban on unsorted, unclean, or contaminated plastic waste for the U.S. towards developing countries who are parties to the Convention and not part of the OECD or other similar agreements. The amendment will have a similar effect for the EU, a party to the Convention, whose own internal legislation

bans such exports of waste.

26. IMO, Marine Environment Protection Committee (MEPC), 73rd session, 22-26 October 2018. http://www.imo.org/en/MediaCentre/MeetingSummaries/MEPC/Pages/MEPC-73rd-session.aspx
27. IMO, Marine Environment Protection Committee (MEPC), 74th session, 13-17 May 2019. http://www.imo.org/en/MediaCentre/MeetingSummaries/MEPC/Pages/MEPC-74th-session.aspx
28. https://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-14-life-below-water/targets.html
29. Together Towards a Sustainable Arctic Iceland's Arctic Council Chairmanship 2019-2021. https://www.government.is/topics/foreign-affairs/arctic-region/icelands-chairmanship-of-the-arctic-council-2019-2021/
30. PAME, Regional Action Plan on Marine Litter, 2019. https://www.pame.is/images/03_Projects/Arctic_Marine_Pollution/Litter/RAP_Work_Plan.pdf
31. Ibid., 38.
32. The Arctic Study, *supra* at 74.
33. Ibid., 74-76.

Hydrocarbon Development in the Arctic: Rights and Responsibilities

Rachael Lorna Johnstone

Hydrocarbon activity can be both harmful and hazardous. It is harmful if, in the course of normal operations, it damages its surrounding environment and/or the interests of other states. States and operators should implement a number of technical measures to ensure that the impacts remain below the legally relevant threshold of "significant" harm. However, hydrocarbon activities are also inherently hazardous because there is always a risk of a low probability/high impact accident, such as an oil spill or an explosion. The harsh conditions of the Arctic, coupled with its sensitive biodiversity, mean that activities in the Arctic are more hazardous than in more temperate parts of the world.

This paper addresses three themes to clarify the rights and responsibilities of states pursuing offshore hydrocarbon development in the Arctic: international law regarding permanent sovereignty and constraints to protect the environment; the interests of other states and the rights of Indigenous and other peoples; the role and limitations of the Arctic Council; and the challenge of Indigenous sovereignty and Indigenous rights.

Global Standards and Principles Regarding Offshore Oil and Gas Pollution Prevention and Their Application in the Arctic

The starting point for any exploration of the Arctic's hydrocarbon resources is the principle of *permanent sovereignty over natural resources*[1] *on or under territory and sovereign rights* over the continental shelf.[2] Part VI of the UN Convention on the Law of the Sea (UNCLOS)[3] determines the principles for allocating rights of access to the continental shelf, delimitation between opposite and adjacent states, and delineation between the coastal states' rights to the shelf and the common heritage of mankind in the Area beyond national jurisdiction. Although not a party, the United States has long endorsed Part VI as customary international law, with the exception of article 82 regarding sharing of the benefits of exploitation beyond 200 nautical miles. Any exploitation of the continental shelf beyond

200 nautical miles (the Area[4]) in the Arctic is still many decades away, leaving these questions largely hypothetical at the present time.

Since extractive activities on the continental shelf are subject to the exclusive jurisdiction of the coastal state, each state regulates these under domestic law. The regimes have been evaluated and compared elsewhere.[5] There is no *obligation* to explore and exploit the continental shelf and each State can establish regulations as strict as it wants or ban it altogether. If development proceeds, the coastal state must respect its international obligations to preserve and protect the marine environment within its own maritime zones, within the zones of neighbouring states, and beyond national jurisdiction.[6] This means that each state is obligated to ensure that its domestic regulation is sufficiently robust to minimise the risk of significant negative impact and to maintain a civil liability regime that will ensure adequate compensation in the event of an accident.[7] In short, international law sets *minimum* standards for states that seek to exploit the continental shelf but no *maximum* standards.

The no-harm principle in international law incorporates the principle of prevention and is an obligation of *due diligence*; the state must take appropriate measures to reduce the risk of *significant* harm.[8] The state must ensure that it maintains the institutional competence to oversee offshore activities and the staff working for these institutions must exercise adequate care, i.e., exercise due diligence.[9] However, the state "does not guarantee that the harm would not occur."[10] The threshold for damage is "significant," not "serious or irreversible."[11] The ostensibly higher risk attached to Arctic activities may increase the burden on the state, the Seabed Disputes Chamber having held that the degree of diligence due is higher for riskier activities.[12]

The principle of prevention in the offshore hydrocarbon industry includes rather stringent obligations to conduct environmental impact assessments (EIAs) and ongoing monitoring.[13] The rights of Indigenous Peoples and human rights must also be protected; even activities far offshore can have major impacts on the natural resources on which Indigenous and other local communities rely. These specifically include cetaceans, fish, and crustaceans, with associated concerns regarding rights to property, culture, food, and private and family life.[14] Certain procedural rights to consultation and, in some cases, free, prior and informed consent (FPIC), also come into play.[15] These are usually managed (though not always adequately) through social impact assessments (SIAs), which vary

among jurisdictions.[16] Indigenous Peoples also have a right to share in the benefits of development, in addition to compensation for any damage.[17]

A number of regional treaties provide more precise regulation; in particular, the Espoo Convention on transboundary environmental impact assessment and the Aarhus Convention on public participation and access to justice.[18] Only five Arctic states are formally parties to the Espoo Convention but all eight are signatories. It is today the "primary standard" for EIA in the Arctic.[19] Denmark (including Greenland), Finland, Norway, and Sweden are parties to the Kiev Protocol on Strategic Environmental Impact assessment, which applies also in cases where only internal impacts are foreseen.[20] Canada, Russia, and the United States have yet to ratify the Aarhus Convention, and the Kingdom of Denmark has a territorial exemption for Greenland. Although each of these countries has its own provisions for public participation, they are not as robust as that required by the Aarhus Convention. Neither the Espoo nor the Aarhus Convention extends to the High Seas or Area.

The International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC) does not regulate the extraction of hydrocarbons as such but it does require offshore petroleum states to prepare for a spill by, for example, training personnel and having equipment on standby.[21] As Shapovalova points out, the logistical challenges in the Arctic suggest that "on standby" is subject to interpretation and that qualified personnel and specialized equipment might be many days' journey away.[22] The OPRC calls on states parties to enter regional agreements on preparedness and response and was the basis for the Eight Arctic states' Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (MOPPR).[23]

The precautionary approach or principle remains contested in international law and the International Court of Justice has yet to endorse it explicitly. However, the Seabed Disputes Chamber considers it "an integral part of the general obligation of due diligence" in cases where there is plausible *prima facie* evidence of potential impacts which is not scientifically conclusive.[24] The precautionary approach has potential application where impacts are insufficiently understood, for example, from seismic testing on marine mammals and fish.[25] In any case, a precautionary approach does not reverse the burden of proof—i.e., it does not require an operator to prove there is *no* harm before proceeding—and it certainly does not prohibit an activity.[26] Commitment to the precautionary principle amongst the Arctic states is varied and later Arctic Council ministerial

declarations have eschewed the term, even if they sometimes implement it in practice.[27]

The OSPAR Convention and subsidiary instruments also reach into a small sliver of the Arctic Ocean.[28] Annex III addresses "prevention and elimination of pollution from offshore sources." It obligates states to require best environmental practices and best available techniques in offshore petroleum activities and prohibits dumping of waste or abandonment of disused installations, etc.[29] The OSPAR Commission has addressed, *inter alia*, environmental monitoring,[30] use of chemicals,[31] discharges,[32] and carbon dioxide storage,[33] etc. However, oil spill prevention is outside the scope of OSPAR and the OSPAR Commission has been restrained in adopting even non-binding measures in this respect.[34] OSPAR was admitted as an observer to the Arctic Council in 2017 and has long worked with the PAME and EPPR Working Groups, as well as the Task Forces on Arctic Marine Cooperation. Operators in the Norwegian or Greenland offshore must be members of the Offshore Pollution Liability Agreement, which ensures that compensation will be available in the event of an injurious oil spill or discharge.[35]

The Role and Limitations of the Arctic Council

The Arctic Council Working Groups play an important role in collating and synthesising scientific data and identifying gaps in knowledge, which are undoubtedly manifold as regards the Arctic marine environment as well as the social impacts of large-scale extractive projects offshore. Setting standards is more difficult, but PAME and CAFF have been active in agreeing on ambitious but non-binding recommendations with regard to, for example, biodiversity, area protection, and ecosystem-based management.[36]

Under AEPS, a set of guidelines for EIA in the Arctic were developed and endorsed by the Arctic states in 1997.[37] They cover only domestic impacts because at that time, it was expected that all the Arctic states would ratify the Espoo Convention, which governed transboundary impacts.[38] These guidelines were largely ignored, but under the 2017-19 Finnish chairmanship, the Sustainable Development Working Group attempted to breathe some life into them and produced a final report in 2019.[39] The five broad recommendations are: engaging in meaningful dialogue with local people; integration of Indigenous and local knowledge;

educating officials regarding the Arctic and capacity-building for local communities; providing space for community input to influence and shape project development; and committing to the Espoo Convention, including for non-parties in the Arctic region.[40] Whether these recommendations will have any real impact remains to be seen. The topic is not a priority of the Icelandic chairmanship.[41]

PAME's Arctic Oil and Gas Guidelines, which are also non-binding, have had more impact.[42] These cover principles for the EIA, including social and human impacts, ongoing monitoring, safety systems, operating practices, emergency preparedness and response, and site clearance. They are intended primarily to encourage the regulatory authorities of the Arctic states to incorporate the standards into the planning process but are also hoped to "be of help to the industry when planning for oil and gas activities and to the public in understanding environmental concerns and practices."[43] They go further than either the OPRC or the MOPPR and, although non-binding, have been found to influence domestic regulation.[44] They are complemented by a "guidance document" on Systems Safety Management and Safety Culture, which focuses on accident prevention.[45]

A recent project by PAME also focused on improving Indigenous and local engagement with marine activities in the planning processes. PAME's 2017 Review of the Arctic Council's recommendations on participation uncovered 29 instruments and defined and mapped the contents of meaningful engagement.[46] PAME followed up the initial report with a more substantial *Part II: Findings for Policy Makers in 2019*.[47] It identified ten examples of "good practice" that Arctic Council institutions, governments, industrial entities, and others could share to improve public participation.[48]

Around 2011, there was a push for binding regulation of offshore hydrocarbon development in the Arctic, including a Greenland-led proposal for a common pre-funded civil liability regime.[49] It proved impossible at that time to agree on common standards, but attention turned to cooperation in clean-up after the fact, which led in turn to the 2013 MOPPR.[50] The agreement builds little on general international law and has no enforcement mechanism. However, it is expected to encourage cooperation by, for example, making it easier to move personnel and equipment across maritime boundaries in an emergency. Some table-top and live-action practise exercises have also been conducted and these are coordinated and reviewed by the EPPR Working Group.[51]

A dedicated Task Force developed a framework plan for cooperation

on prevention of oil pollution from petroleum and maritime activities in the marine areas of the Arctic in 2015.[52] *Inter alia*, it calls on the regulatory authorities to cooperate, share best practices and promote common standards, but is non-binding and subsidiary to domestic law.[53] Implementation of the plan is monitored by the EPPR Working Group.[54] The Arctic Council created the Arctic Offshore Regulators Forum in 2015 to further the Task Force's recommendations, in particular through exchanges of knowledge and experience, exchange of technical and operational information, and creating a network of offshore petroleum safety regulators.[55] The members are the Arctic states, represented by their respective regulatory agencies. Observer status is also possible.[56] The Forum cannot make binding regulations.[57]

In 2019, the Second Task Force on Arctic Marine Cooperation proposed the creation of an SAO mechanism to facilitate improved sharing of information and standards on offshore activities, provide strategic guidance on marine issues to other Arctic Council bodies, and monitor follow-up of Working Group recommendations.[58] The ministers accepted the proposal but the precise format is yet to be developed.[59]

Although the Arctic Council is not a law-making body, the three binding treaties negotiated under its auspices prove that its structural ambiguities are not a barrier if there is sufficient will. In any case, the three treaties have no enforcement provisions to speak of, so the distinction between "hard law" and "soft norms" or guidelines is not necessarily that important.[60] The Arctic Council's weak structure can also be viewed as one of its strengths: flexibility. Not being restricted by a founding treaty that exhaustively lists its competences, the states and permanent participants can turn their attention to *any* matter of interest, *so long as all of them agree to do so*. This also means, of course, that it takes only one state, or, in practice, the collective efforts of the permanent participants, to keep a matter *off* the table. The consensus approach would make it difficult to agree on binding resolutions but allows for constructive and inventive non-binding strategies. Softer guidelines and frameworks also make it politically easier to include non-Arctic states as Arctic Council members can seek cooperation without ceding control.[61]

The examples mentioned already are not exhaustive of the Arctic Council's work in this area. Marine environmental security is a concern of all Arctic states, and especially among the permanent participants. The Council's work is not directly impeded by the United States' current unique

position regarding climate change science. However, the work is only often at a general level or on issues not connected to hydrocarbons. The Arctic Marine Environment is one of four policy priorities for the Iceland chairmanship, but the emphasis is on plastic litter, living marine resources, and shipping safety.[62] Russia and Norway will follow as chairs and, given the relatively advanced state of their Arctic hydrocarbon industries, attention might return.

The Arctic Council has historically been shielded from international tensions, including very serious disputes such as over the Russian annexation of Crimea. That comity is not guaranteed. The U.S. Secretary of State Mike Pompeo's speech at Rovaniemi in May 2019 indicated a less cooperative approach. However, given recent practice, this Secretary of State may well be replaced long before the U.S. Arctic policy.

Arctic Sovereignty Re-examined and the Rights of Indigenous Peoples

The Arctic states assert their sovereign rights in the Arctic as elsewhere. Tartupaluk (Hans Island) aside, there are no inter-state sovereignty disputes in the Arctic. However, this does not mean there are no *sovereignty* disputes. State sovereignty is contested *inside* of states. Arctic Indigenous Peoples are particularly well organised and active in pursuing their international legal rights to self-determination, including permanent sovereignty over their resources. This includes maritime areas and resources upon which they have historically relied. However, Indigenous sovereignty might extend even further offshore.

A state's sovereign rights to the continental shelf, as we all know, "*exist ipso facto and ab initio, by virtue of its sovereignty over the land*."[63] However, if a state's sovereignty over its land is contested and incomplete, then its maritime zone might also be challenged. If an Indigenous People holds sovereignty over the land, it follows that the "natural prolongation" of that land also belongs to the Indigenous People. To date, most states reject indigenous title offshore.[64] Nevertheless, the potential of an Indigenous challenge to a state's sovereign rights complicates the future of offshore extractives in the Arctic.

Arctic states do acknowledge and accept limited rights of Indigenous Peoples to govern, amongst other things, their own land, resources, and

development based on their historic sovereignty claims and to continue their traditional ways of life without interference from offshore industrial activities.[65] Therefore, any hydrocarbon activities must be conducted in a manner that does not disturb the migration, feeding and mating routes of the marine mammals and fish on which Indigenous Peoples continue to rely.[66]

Indigenous Peoples have very strong rights to participation in the decision-making processes that are increasingly moving towards the principle of free, prior, and informed consent. From the corporate perspective, an investment *without* the free, prior and informed consent of the Indigenous community is a risky one indeed and can expect protracted litigation and delays, and potentially even termination.[67]

Environmental impact assessments (EIAs) have tended to rely on western scientific method and the consultation methods have often been transplanted directly from industrialised, large-population centres without sufficient sensitivity to the nuances of small, isolated, Arctic settlements.[68] There are basic problems of linguistic translation – where certain words simply do not exist in Indigenous languages. For example, there is no word in Kalaallisut (West Greenlandic) for "seismic." The closest translations to "seismic testing" in Kalaallisut are *immap naqqa misissorlugu* or *immap naqqanik misissuineq* (en: "investigating the sea bottom") but neither captures the technical nature of the activity.[69] There are incongruences between what developers and local communities consider important. For example, at consultation meetings (which are very often information lectures with limited time for interactive discussion), the technical experts might be able to present complex scientific and technical information but not be able to answer the questions that local people have about social and spiritual impacts.[70] There are also fundamental challenges of cultural translation. Indigenous Peoples have different ways of expressing consent or dissent; silence might simply indicate that people are taking time to consider a matter and should not be mistaken for acquiescence or agreement.[71] In small settlements, people are more likely to use informal pathways rather than formal consultation meetings, and both developers and governments need to look to new strategies to ensure a full exchange of information.[72]

An effective EIA or SIA process requires genuine multi-directional communication. Developers need to talk to local communities, but they must also listen. Scientific information will not necessarily be presented in

the figures and graphs to which they are accustomed but might come in anecdote, story or song. Translation is not only a matter of language but also of epistemological frameworks. Western-trained engineers cannot do this without the support of Indigenous and local people within their teams.

Notes

1. UN General Assembly, Permanent Sovereignty over Natural Resources, UNGA Res 1803 (XVII), 14 December 1962.
2. See Rachael Lorna Johnstone, *Offshore Oil and Gas Development in the Arctic under International Law: Risk and Responsibility* (Brill: Leiden, 2015), Ch. 4.
3. UN Convention on the Law of the Sea 1982, 1833 UNTS 397 (UNCLOS).
4. The "'Area' means the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction": UNCLOS, article 1. It is common heritage of mankind and is regulated according to Part XI of UNCLOS and the Agreement Relating to the Implementation of Part XI of UNCLOS 1994, 1836 UNTS 42.
5. On domestic regulatory standards, see, e.g., Daria Shapovalova, "International Governance of Oil Spills from Upstream Petroleum Activities in the Arctic: Response over Prevention?" *The International Journal of Marine and Coastal Law*, 2019. DOI: <https://doi.org/10.1163/15718085-23342029>; Daria Shapovalo, "Special Rules for the Arctic? The analysis of Arctic-specific safety and environmental regulation of offshore petroleum development in the Arctic Ocean States," (forthcoming, 2019); *Governance of Arctic Oil and Gas Activities*, Cécile Pelaudeix and Ellen Margrethe Basse, eds. (Routledge: Abingdon, 2017); Timo Koivurova and Pamela Lesser, Environmental Impact Assessment in the Arctic: A Guide to Best Practice (Edward Elgar: Cheltenham, 2016); Maria Madalena das Neves and Nigel Bankes, "The Energy Policies of Selected Arctic States," *Polar Law and Resources*, Natalia Loukacheva, ed. (Norden: Copenhagen, 2015); James Henderson and Julia Loe, "The Prospects and Challenges for Arctic Oil Development," *The Oxford Institute for Energy Studies Working Paper* 54 (November 2014). https://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/11/WPM-56.pdf?v=0bfc16cc12ef (accessed July 4, 2019)
6. UNCLOS, *supra* note 3, Part XII. See, especially, article 192, 194 and 208, requiring domestic standards to be 'no less effective' than internationally agreed norms.
7. See, generally, Johnstone, *supra* note 2, especially chapters ten and eleven.
8. Ibid., 30-45.

9. *Pulp Mills on the River Uruguay, Case Concerning (Argentina v Uruguay)* (Merits) [2010] ICJ Rep 14, para 197; *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area*, International Tribunal for the Law of the Sea: Seabed Disputes Chamber Case No. 17 (Advisory Opinion), February 1, 2011. http://www.itlos.org/index.php?id=109 (accessed July 2, 2019), para 115; International Law Commission, Draft Articles on Prevention of Transboundary Harm from Hazardous Activities 2001 in Report of the International Law Commission on the Work of its Fifty-third Session, UN GAOR, UN Doc A/56/10 (2001), commentary to article 5, para 3; and Pisillo-Mazzeschi R, "Due Diligence" e Responsabilitá Internazionale degli Stati, Series: Quaderni di <Studi Sensi> *Raccolti da Paulo Nardi* no. 67 (Giuffré: Milan, 1989): 231-232.
10. ILC Draft Articles on Prevention, *supra* note 8, commentary to article 3, para 7.
11. Pulp Mills, *supra* note 8, para 101.
12. *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, supra* note 8, para 117; see also ILC Draft Articles on Prevention, supra note 8, commentary to article 3, para 11.
13. Ibid., paras 204 and 266; *Case Concerning the Gabčíkovo-Nagymaros Project (Hungary v Slovakia)*, Separate Opinion of Weeramantry [1997] ICJ Rep 88, 111-2. See also Johnstone, *supra* note 2, chapters seven and eight.
14. See Johnstone, *supra* note 2, chapter five; see also Michael Burger, "Narratives in Conflict: Alaska Natives and Offshore Drilling in the Arctic," [2014:1] N*ordic Environmental Law Journal* 77 (on *Alaska Wilderness League v Kempthorne* 548F.3d 815, 817-818 (9th Cir. 2008)
15. Johnstone, *supra* note 2, chapter five; see also Rachael Lorna Johnstone, "Indigenous Rights in the Marine Arctic," In *Governance of Arctic Oil and Gas Activities, supra* note 4, 72-91.
16. See, e.g., Emma Wilson, "What is Social Impact Assessment?" *Indigenous Peoples and Resource Extraction in the Arctic: Evaluating Ethical Guidelines*, January 2017. https://www.researchgate.net/publication/315550573_What_is_Social_Impact_Assessment (accessed March 12, 2019)
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Arctic Council Responses to Land-based and Air Pollution

Jim Gamble

The Arctic Council's working groups develop their activities on pollution using a bottom-up approach that includes input from the Arctic states, Permanent Participants, and accredited Observers (both countries and organizations).

In this paper I will provide a brief history of the Arctic Council (AC), highlighting the importance that the growing awareness and knowledge about Arctic pollution played in the formation of the AC. I'll discuss the Regional Programme of Action for Protection of the Arctic Marine Environment from Land Based Activities (RPA) and its role as an early framework document of the AC for action on Arctic pollution, summarize the activities of the Arctic Monitoring and Assessment Programme (AMAP), which works to provide reliable and sufficient information on the status of and threats to the Arctic environment, and highlight the achievements of the Arctic Contaminants Action Program, which was specifically created to address Arctic pollution sources identified through the work of AMAP. Later, I'll provide an overview of the series of task forces and expert groups created by the Council to address black carbon, methane, and other short-lived climate pollutants, beginning with the Task Force on Short-Lived Climate Forcers, which was created by the AC in 2009. Finally, I will summarize the successes of these groups, and discuss steps that might be taken to make work of the AC on land-based and air pollution more effective.

A Brief History of the Arctic Council

Mikhail Gorbachev's 1987 speech, sometimes referred to as the Murmansk Initiative, officially opened the possibility of cooperation with the USSR on Arctic environmental protection and management.[1] Gorbachev's idea to organize an international conference, and perhaps a council on Arctic scientific research coordination, was realized in 1989 when Finland initiated a process on international cooperation to protect the Arctic environment.

The USSR's gesture and Finland's response were partially due to growing evidence that there was an accumulation of trans-boundary contaminants and pollution in the Arctic. The Finnish initiative began a negotiation among the Arctic states known as the Rovaniemi Process, which culminated in 1991 at the first ever meeting of the Ministers of the Environment of the Arctic states. Working groups addressed specific environmental issues, and also drafted the Terms of Reference for the Arctic Environmental Protection Strategy (AEPS). In June 1991, the AEPS and the Declaration on the Protection of the Arctic Environment ("Rovaniemi Declaration") were formally adopted. The AEPS outlined five objectives:

1) To protect the Arctic ecosystem, including humans;
2) To provide for the protection, enhancement, and restoration of environmental quality and the sustainable utilization of natural resources, including their use by local populations and Indigenous peoples in the Arctic;
3) To recognize and, to the extent possible, seek to accommodate the traditional and cultural needs, values and practices of the Indigenous Peoples as determined by themselves, related to the protection of the Arctic environment;
4) To review regularly the state of the Arctic environment;
5) To identify, reduce, and, as a final goal, eliminate pollution

Wishing to expand the AEPS in order to include sustainable development and other issues, the ministers of the Arctic states began a negotiation resulting in the Ottawa Declaration, which established the Arctic Council in September of 1996.[2]

The Arctic Council Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities (RPA)

The AC Ministers adopted the Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities (RPA) in 1998. The RPA is the regional extension of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA). The GPA is designed to be a source of conceptual and practical guidance to be drawn upon by regional and national authorities

in devising and implementing sustained action to prevent, reduce, control, and eliminate marine degradation from land-based activities.[3]

Since its establishment, the RPA has provided a way to undertake action on many AC priorities and has influenced a number of AC outputs, including the Arctic Climate Impact Assessment (ACIA) and the Arctic Human Development Report (AHDR). The RPA also serves as a basis for national programs adopted by the Arctic states. The RPA framework also provides essential guidance for the development of long-term plans of action such as the Arctic Marine Strategic Plan (AMSP), which encompasses actions related to the Arctic marine environment by all of the AC.

The effectiveness of the RPA must be viewed through two lenses. First, the process developed by the RPA has been extremely successful in improving cooperation among the Arctic states, non-Arctic states, and other entities engaged in activities to address land-based sources of pollution. Second, for the RPA to remain up to date, it must monitor and consider new research, technology, methodology, and policies adopted by the Arctic governments. It is in this area that the RPA has fallen short. If the RPA is to provide a mechanism for improving cooperation, there must be regular reviews of the RPA. For this to happen, a well-organized mechanism (a secretariat or other entity) should be tasked with accumulating outputs from the AC working groups and other sources, and then updating the RPA. As it stands now this function happens on an ad hoc basis, and reviews have not happened regularly. Also, changes to the text of the RPA must go through a review by the Senior Arctic Officials, necessitating a process of drafting, review, re-drafting, etc. A better mechanism might be to amend the RPA through a series of annexes, which would allow the original text to remain unaltered. The ideas outlined above, were also part of the conclusions drawn from an update to the RPA, which was completed by the Protection of the Marine Environment (PAME) working group of the AC in 2009.[4]

As development increases in the Arctic, the RPA must address new threats by encouraging action through national and regional environmental programs. But despite its importance, the RPA has fallen behind. I asked a colleague who has worked within the AC on pollution issues for many years what his opinion was of the RPA; his response was that he had never heard of the document. I believe that a review and update of the RPA by the AC could revive it as a tool to aid cooperation on reducing pollution in the Arctic.

The Arctic Monitoring and Assessment Programme (AMAP)

Established by the Arctic Environmental Protection Strategy in 1991, AMAP measures levels of anthropogenic pollutants in the Arctic environment, documents pollution trends, and tracks the sources and pathways of pollutants. AMAP also examines the impacts of pollution on Arctic flora and fauna, emphasizing those used by Indigenous Peoples. AMAP provides advice to ministers of the Arctic states on how to prioritize actions to improve Arctic conditions. AMAP prioritizes a number of contaminant groups and issues, including persistent organic pollutants (POPs), heavy metals (including mercury, cadmium, and lead), radioactivity in the Arctic, the environmental consequences and biological effects of climate change, and ocean acidification. AMAP also seeks to understand the combined effects of pollutants and other stressors on both ecosystems and humans in the Arctic.[5]

AMAP has published a number of groundbreaking assessments, and its work on POPs provides an example of the way AMAP has influenced pollution control in the Arctic. In the 1970s, DDT was detected in the blubber of marine mammals in the Arctic, and by the 1980s there was evidence that DDT and other POPs were being transported to and accumulating in the Arctic.[6] The rising levels of these pollutants represented an urgent threat to the Indigenous Peoples of the Arctic who depend on marine mammals as a significant part of their diet. The vast majority of these pollutants were being transported into the region from afar, so regional policies on POPs were not an effective mechanism to reverse the trend. The United Nations Environment Programme (UNEP), recognizing the evidence of POPs accumulation in the food chain, convened an International Negotiating Committee (INC) mandated to prepare an instrument for action on 12 compounds (the so called "Dirty Dozen"). This resulted in the adoption of the Stockholm Convention on Persistent Organic Pollutants 2001.[7] AMAP did significant work on the state of POPs in the Arctic environment,[8] and the participation of Arctic states in the negotiation was guided by AMAP's assessment. The negotiation of the Stockholm Convention could have turned out differently if it were not for the data provided by AMAP and the participation of Arctic states and Permanent Participants. Notably, the Inuit Circumpolar Council's involvement in the negotiations put a human face on the issue, and had a very positive influence on the proceedings.[9]

The significance of the Stockholm Convention can't be overemphasized because we now know that the regulations have resulted in a decrease of legacy compounds in the Arctic.[10] In addition to monitoring legacy pollutants, AMAP also identifies new compounds that could pose a threat to the Arctic, allowing those to potentially be regulated through regional, national, or international action.[11]

The success of the Stockholm Convention is just one example of AMAP having an influence on Arctic affairs. The relocation of the AMAP Secretariat to Tromsø, Norway should improve collaboration even further with the AC.

The Arctic Contaminants Action Program (ACAP)

ACAP was founded in 2006 to address Arctic pollution sources identified by AMAP. ACAP seeks to bring about national actions to reduce emissions, discharges, and other releases of pollutants, as well as to mitigate identified concentrations of pollutants in the Arctic. ACAP has four expert groups: POPs & Mercury, Hazardous Wastes, the Indigenous Peoples Contaminants Action Program (IPCAP), and Short Lived Climate Pollutants (SLCP)

The on-the-ground nature of ACAP's work can be illustrated by past projects of the group:

- Environmentally Sound Management of Obsolete Pesticides in the Russian Federation, Phases I and II.[12] The survey, assessment, and safe storage of nearly 7000 tons of obsolete pesticides in the Russian Arctic
- Murmansk Bus Company Retrofit Project.[13] Murmanskavtotrans, the largest bus company in Murmansk, cut its black carbon emissions by 90 percent.

ACAP has also produced Arctic pollution fact sheets on dioxins, renewable energy in the Arctic, black carbon, and Indigenous community waste management. In recent years, ACAP has increased its focus on climate pollutants.

ACAP supports the Russian Federation, where remoteness and lack of infrastructure make pollution issues more urgent, in meeting their international obligations from the Stockholm, Basel, and Minamata Conventions. ACAP also shares best practices on waste management, which

represents a way to reduce contaminants, climate pollutants, and marine litter, which is particularly important in areas off the road system, where adherence to waste disposal regulations might not be possible.

ACAP has been aided by the development of the Project Support Instrument (PSI), a fund administered by the Nordic Environment Finance Corporation (NEFCO), which supports prevention and mitigation of pollution in the Arctic region.[14] The PSI is funded by a number of Arctic states and regional entities, and criteria for determining the suitability of a particular project include: approval by one or more AC working groups; replicability; and whether it will lead to actions towards pollution prevention, abatement, and elimination, with positive effects on the Arctic environment. The fund, launched in 2014 with contributions of nearly 16 million Euros, is available to any of the AC working groups, but the mandate to accomplish pollution mitigation/elimination means that PSI projects are virtually all within ACAP. One exception is a Conservation of Arctic Flora & Fauna (CAFF) project to protect habitats for Arctic migratory birds. Migratory birds are affected by pollutants along their flyways, and are also a vector for transporting pollutants into the Arctic.[15]

The PSI has been a case study of how an AC funding mechanism might work. However, a successful PSI proposal must take into account the wishes of contributing countries (particularly the Russian Federation, which contributed the largest amount to the fund), the rigorous vetting by NEFCO, and AC timing for project approvals. So, the pursuit of PSI funding is a daunting task, and the original contributions to the PSI still have not been fully dispersed.

In sum, ACAP has had much success with pollution prevention and mitigation, and streamlining the PSI could make the group even more effective.

Black Carbon and Methane Pollution in the Arctic

In 2004, the Arctic Climate Impact Assessment found that Arctic warming is occurring twice as fast as the rest of the planet.[16] Thus the Arctic, a region that contributes little to no anthropogenic greenhouse gas emissions, is disproportionately affected by global processes over which it has little control. This is especially true for Arctic Indigenous Peoples, who face an existential threat to their way of life due to the cascading biological impacts

of this rapid warming.

While the Arctic states are involved in processes to reduce GHG emissions and slow warming globally, a regional approach to reducing the emissions of short-lived climate pollutants (SLCPs) can result in near-term reductions in warming, mitigating some of the effects of the warming Arctic[17] while efforts to reduce carbon dioxide emissions continue globally. The AC is working on assessing and mitigating emissions of SLCP's from within the Arctic, focusing on black carbon (soot) and methane. Reducing emissions of black carbon is particularly important, as the effects of black carbon are local in nature. The settling of black carbon on ice and snow results in greater absorption of the sun's energy and increased melting, so emissions of black carbon in the Arctic have a stronger effect than outside the Arctic.[18] The reduction of methane globally benefits the Arctic disproportionately, so efforts to reduce methane emissions pay off with an "extra" benefit for the Arctic.[19]

Work aimed specifically towards black carbon and methane reductions by the Arctic states has occurred in a series of task forces and expert groups designed to examine the problem and devise mitigation measures. These are:

The Task Force on Short-Lived Climate Forcers (SLCF), 2009—Initially focused on black carbon, but then methane and tropospheric ozone were added to its mandate. The group produced a progress report and recommendations to ministers on black carbon in 2011, and a further report in 2013.

The Task Force on Black Carbon and Methane (TFBCM), 2013—was mandated to develop actions to achieve black carbon and methane reductions in the Arctic, and in 2015 produced a report which included a framework for action.

Expert Group in Support of Implementation of the Framework for Action on Black Carbon and Methane, 2015—is mandated to assess progress on implementation of the Framework, and to inform policy makers from Arctic states and participating AC observer states. This includes preparing every two years a "Summary of Progress and Recommendations" report, with appropriate conclusions and recommendations. This group had their 6th meeting in Helsinki, Finland in 2019 and remains active in the AC.

Key commitments in the Framework include:

- Taking "enhanced, ambitious, national and collective action to accelerate the decline in overall black carbon emissions and to significantly reduce overall methane emissions."

- Adopting, an "ambitious, aspirational and quantitative collective goal on black carbon, and to consider additional goals."
- Submitting biennial national reports on countries' existing and planned actions to reduce black carbon and methane, national inventories of these pollutants and, if available, projections of future emissions.

To achieve these commitments the Framework compiled a list of 12 recommendations in four key areas: 1) Diesel-powered mobile sources, 2) Oil/gas methane leakage, venting and flaring, 3) Residential biomass combustion appliances, and 4) Solid waste disposal.[20]

Work under the Framework is accomplished through partnership with AC working groups, notably AMAP, which provides assessments on the state of SLCPs in the Arctic environment, and ACAP, which undertakes projects to mitigate real-world sources of SLCPs.

Summary and Conclusions

The 2009 Tromsø Ministerial meeting, which marked the conclusion of the first Norwegian Chairmanship of the AC, included two key presentations. One was by U.S. Vice President Al Gore, who gave a version of his "An Inconvenient Truth" talk, and the second was by Dr. Robert Corell, summarizing what had occurred since the publication of the Arctic Climate Impact Assessment five years previously. These presentations complimented each other perfectly; the first about the dangers facing our planet, and the second about changes in the Arctic happening faster than expected.

Since the Rovaniemi Process, the AC has focused its attention on pollution in the Arctic. The work of AMAP and ACAP has made substantial contributions to remarkable accomplishments, including the Stockholm Convention, the Minamata Convention (on reductions of mercury), and pollution mitigation actions resulting in the safe disposal of hundreds of tons of obsolete pesticides, PCB's, heavy metals, and other pollutants. Efforts have been made to include the Indigenous Peoples of the Arctic in these activities and to address those sources of pollution that affect them directly. I feel the 2009 Tromsø Ministerial meeting was where the AC turned its public face towards the growing problem of climate change in the Arctic and began an organized, deliberate process to address the issue

with its work on SLCPs.

The AC historically suffers from a few shortcomings; its consensus-based decisions follow what is acceptable to the least ambitious, limiting bold action. The lack of a consistent source of funding for AC activities means that projects are sometimes underfunded and may slow or stall due to a lack of resources, and the limited funding of the Permanent Participants means that while their contributions are needed, their engagement is often limited or missing. In addition, mechanisms like the RPA, which should be updated on a regular basis, are underutilized as tools due to a lack of timely scrutiny and action.

There has been significant progress on pollution and climate change issues in the Arctic, and there continues to be a focus on new challenges through AMAP, ACAP, and the Expert Groups. If the AC could address internal issues that are slowing this progress, even more could be done.

Notes

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A Perspective from an Early Career Researcher

Jeehye Kim

Introduction

This paper will examine the issue of preventing and controlling pollution in the Arctic from a non-Arctic state perspective, more specifically through the case of the Republic of Korea (hereinafter referred to as Korea). The first part will examine the extent Korea has participated in the Arctic Council (AC) to address Arctic pollution issues and its limitations. The second part will look at Korea's effort at implementing global agreements to address long-range pollution in the Arctic, and about air pollution more generally. Finally, the paper will highlight some of the potential areas Korea could make an impact towards clean shipping.

Efforts through the Arctic Council

Having become an AC observer at the Kiruna Ministerial in May 2013, Korea does not have a long history in the AC. Furthermore, limitations imposed on observers in the AC affect the level and extent of participation by observer states. For example, observers can only make project proposals through an Arctic state or a Permanent Participant, and in any given project the total financial contributions from all observers cannot exceed the financing from Arctic states, unless otherwise decided by the Senior Arctic Officials.[1] From a more realistic standpoint, AC working group projects also tend to pursue projects with a regional, sub-regional, or local focus, which further narrows the scope for participation by observer states that either lack the expertise or interest. Nevertheless, Korea has been part of some meaningful engagements with the AC with regard to Arctic pollution prevention and control that are worth mentioning here.

The AC encourages observers to primarily participate in the AC through its working groups.[2] While projects related to preventing and controlling pollution in the Arctic are being carried out to varying degrees in the six AC working groups, Korea has been the most active in the working group for Protection of the Arctic Marine Environment (PAME), participating in

projects that relate to shipping. Korea regularly attends PAME meetings, and the first AC project Korea participated in was also a PAME approved project, the Arctic Marine Indigenous Use Mapping (AMIUM) project, led by the Aleut International Association, where Korea Maritime Institute provided financial and in-kind support. The project aimed to develop tools for the indigenous community to map how they were using the oceans, in line with AMSA Recommendation II (A), which encouraged Arctic states to conduct surveys on Arctic marine use by indigenous communities where gaps are identified to collect information for establishing up-to-date baseline data to assess the impacts from Arctic shipping activities. Another PAME project that Korea has been participating in is the project to develop a framework for more systematically engaging observers on shipping related matters. The AC in general has in recent years sought to increase observer engagement, and this project saw the need to more effectively leverage the expertise, experience, and resources of AC observers as PAME has seen an increase in its shipping-related projects with the growing shipping activity in the Arctic.[3]

Korea also continues to seek to learn and contribute to the building of knowledge about shipping issues that are of importance to the Arctic community and explore areas where Korea could cooperate by attending meetings organized by PAME such as the Arctic Marine Litter Workshop and the Arctic Shipping Best Practice Information Forum, and organizing seminars inviting experts from the PAME Shipping Expert Group. Korean experts have also participated in authoring working group publications, and some important AC publications have been translated into Korean to help expand the outreach and important works of the AC. Additionally, Korea has sought to contribute to building knowledge about the state of black carbon and methane in and around the Arctic by voluntarily submitting the national report and by attending the Expert Group on Black Carbon and Methane (EGBCM) meetings.

Implementing Global Agreements Addressing Long Range Pollution in the Arctic

More science is needed but the AC AMAP working group has identified that some Long Range Transported (LRT) contaminants found in the Arctic (such as Persistent Organic Pollutants (POPs) and heavy metals) originate in lower-latitude regions. For example, the main source for mercury

accumulating in the Arctic is increasingly coming from coal burned to produce electricity in Southeast Asia.[4] While it would be difficult to figure out exactly which LRT contaminants that end up in the Arctic have their sources originating from the Korean peninsula, examining Korea's efforts at the domestic and international level in addressing important LRT contaminants could help assess Korea's contribution.

In this regard, Korea has been active in joining various global agreements that address LRT contaminants, being a party to more than 50 major international environmental agreements, some of which concern transboundary pollution, including the Minamata Convention on Mercury, the Stockholm Convention on POPS, and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. Furthermore, these international standards and rules have been adopted into domestic law and governance systems for implementation. For example, after Korea ratified the Stockholm Convention in 2007, the "Law on the Management of POPs" was enacted, which came into force a year later. In 2016, in preparation to ratifying the Minamata Convention on Mercury, Korea revised its law to include regulation prohibiting the import and export as well as the use of mercury and mercury compounds. Korea continues to update its national policy on mercury every five years and continues to monitor the nation's mercury level.

On Korea's efforts to combat air pollution in general, after experiencing a rapid industrial development in the latter half of the 20th century, air pollution started to become a serious problem in the late 1960s. In 1997, Korea set environmental limits on sulfite gas, and has since established environmental limits for carbon monoxide, nitrogen dioxide, and other pollutants. Korea has embarked on a path to transition into a green economy, becoming a party to the Paris Climate Change Agreement, and making the commitment to reduce its GHG emissions by 37 percent compared with BAU by 2030. However, with an economy dependent on energy-intensive industries, it will be a significant challenge for Korea to transition towards a cleaner economy. In fact, according to an OECD report[5] that reviewed the environmental performance of Korea, it pointed out that Korea has declared many ambitious policies, and while the country is a technology leader that is well placed to profit from a transition to a low-carbon economy with an energy mix currently dominated by fossil fuels, Korea's greenhouse gas emissions actually rose by 39 percent between 2000 and 2013.

Potential Contribution to Clean Shipping

As a maritime nation with 99 percent of its trade seaborne and an advanced shipbuilding industry, Korea has the potential to make important contribution to clean shipping. In 2018, Korea ranked 8th in the world for ship-owning,[6] and was the biggest shipbuilder in terms of orders volume, doing particularly well in the LNG carriers market.[7] Korea is well positioned in the shipbuilding industry in response to the growing demand for environmentally-friendly vessels, and the country has the capacity to introduce clean shipping technologies globally and in the Arctic. Already, Korean shipbuilding companies have been part of the Arctic development. A Korean shipbuilding company, DSME, was involved in constructing and delivering 15 LNG icebreakers to be used for the YAMAL project. Other shipbuilding companies such as Samsung Heavy Industries are also making R&D investments to develop year-round icebreaking vessels with double acting hull in preparation for Arctic LNG-2 and other projects.[8] In addition, Hyundai Mipo Dockyard (HMD) recently developed the first ballast-free LNG bunkering vessel, which could have positive implications for sensitive Arctic waters as we see increased traffic along Arctic sea routes.

When it comes to international standards in shipping, Korea has already adopted the Polar Code and domestic legislation is in place to support its provisions. Also, Korea has been cooperation with Russian universities in respond to challenges in providing adequate training for seafarers in polar navigation. Furthermore, Korea follows the general global trend towards stronger regulation of shipping emissions and promoting clean shipping, which will undoubtedly have positive ramifications for the Arctic as well. In particular, from 2020 the global Sulphur cap for marine fuels will be lowered from the current 3.5 percent to below 0.5 percent. Accordingly, Korea has adopted a law on promoting the development and supply of environmentally friendly vessels, and has also adopted a special law aimed at improving air quality in regions where ports are located. Additionally, Korea is considering establishing Emission Controlled Areas (ECAs) in Korean waters, joining the movement towards setting high standards in marine fuels. At the moment there are four ECAs (along the U.S coast, the Caribbean, North Sea, and Baltic Seas) where sulfur content is limited to a maximum of 0.1 percent. China too has recently established a coastal ECA that limits sulfur content of marine fuels to a maximum of 0.5 percent.

However, some challenges in moving forward to cleaner shipping will include the costs for shipping companies in switching to cleaner fuel sources. Changing vessel designs to accommodate cleaner fuel or applying systems that

allow for cleaner emissions all mean added costs for shipping companies. At a time when the national and international shipping and shipbuilding industries are going through difficult times, making a transition to cleaner shipping will be an extra burden for many companies. Furthermore, a smaller-sized clean shipping-related market in Korea compared to other countries and regions such as Europe could be another challenge.

Conclusion

As a major maritime nation with a large and advanced shipping and shipbuilding industry, Korea has much potential to contribute to preventing and controlling pollution in the Arctic, especially vessel-source pollution as shipping activity grows in the Arctic. Thus, the AC would stand to benefit from better engaging observers, which is a question the PAME working group and the AC in general are currently looking at. Overall, the global trend towards clean shipping and many efforts by countries, including that of Korea, to transition to a cleaner economy, despite it challenges, will undoubtedly also have positive ramifications for the Arctic.

Notes

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Resource Development and Pollution Prevention in the Russian Arctic

Daria Shapovalova

Russia accounts for more than half of the Arctic Ocean coastline and has sovereign rights for its vast Arctic offshore petroleum resources. The Northern Sea Route (NSR) along the Russian coast is projected to become the main shipping lane for Arctic resources.[1] Russia is the largest gas and second-largest oil exporter in the world.[2] Its economy is highly dependent on petroleum exports,[3] as witnessed by the recession that followed the 2014 oil price drop.[4] With maturing provinces onshore, and more than half of Russian State revenue coming from oil and gas development, the industry is turning to the Arctic and Far East.[5]

Anthropogenic activities have had negative impacts in the Russian Artic for decades, including topsoil and permafrost destruction from industrial development, mining, pipelines, nuclear testing, and—more recently—an acceleration of oil and gas exploitation. Most of the pollution in the region originates from domestic anthropogenic activities and from Southeast Asia.[6] Additionally, there is substantial "legacy" pollution accumulated over decades of poor environmental policies during Soviet times.[7]

Today, resource development activities comprise the biggest sources of pollution in the Russian Arctic. The so-called "pollution hotspots," formed around large industrial projects, are usually located next to population centres and can have catastrophic effects on the environment and human health.[8] Among such hotspots are areas around Norilsk (nickel mining centre), Western Siberia (oil and gas development), and Kola Peninsula (metal mining).[9] Further, there are concerns over radioactive contamination associated with dumped nuclear waste in the Russian Arctic, especially around Novaya Zemlya.[10] A growing concern today is the possibility of oil spills from the expanding offshore petroleum industry, as any such pollution would be challenging to clean up and have long-lasting effects on the local flora and fauna[11]—as well as on its Indigenous human populations.

This paper briefly outlines Russian Arctic policy and environmental regulation with a focus on resource development. It then examines the extent of Russia's participation in international and regional environmental

governance. Finally, it considers successes and challenges in pollution prevention in the Russian Arctic.

Environmental Protection in Russian Arctic Policy

Russia is a federal republic, yet Arctic governance is highly centralised due to its economic, strategic, and political importance. Arctic policy documents in Russia cover a range of issues, such as military security and the development of the NSR as the main transportation lane in the Arctic. The main Arctic-related policy documents are:

- 2008 *Fundamentals of the State Arctic Policy until 2020 and Further*,[12] which defines national interests, priorities, and tasks, and serves as basis for all further Arctic-related legislation. The Fundamentals define four national interests: 1) using the Arctic as a resource base for the country's socio-economic development; 2) preserving it as a zone of peace and cooperation; 3) preserving unique Arctic ecosystems; and 4) using the NSR as a national transport artery in the Arctic.
- 2013 *Strategy for the Russian Arctic Zone Development and Ensuring State Security until 2020*,[13] which elaborates on the mechanisms necessary to achieve the goals set for Arctic development. It acknowledges risks and threats of operating in the Arctic: extreme climatic conditions, low population and infrastructure density, and the limited resilience of the Arctic ecosystem.[14] It notes the increasing anthropogenic pressures on Arctic ecosystems, with significant pollution concentrations on land and offshore, characterized by pollution hotspots and accumulated pollution.[15] The Strategy outlines a number of measures to address environmental issues in the Arctic, most of them relating to increased monitoring, establishment of protected areas, and imposing stricter regulation on potential polluters.[16]

Although Russian Arctic policy acknowledges the environmental problems in the Arctic and outlines some ways to address these, it also places a significant emphasis on resource development without meaningful acknowledgment that the two can be in conflict.[17] Thus, the policy notes the need to extend hydrocarbon development operations north and offshore

and calls for enhanced exploitation of offshore petroleum resources, as well as increased use of the NSR. To reconcile these two goals, a revision of the current legislative framework for resource development in the Russian Arctic is necessary. The next section examines the current regulatory framework for offshore petroleum development in the Russian Arctic.

Environmental Regulation of Resource Extraction Activities in the Russian Arctic[18]

While Russian legislation establishes stringent requirements for companies with regards to gaining access to petroleum licenses in the Arctic waters, it does not provide substantial additional requirements in the environmental or safety regulation of petroleum operations.[19]

The legal framework for offshore petroleum development is constantly evolving and consists of federal laws, codes, presidential and governmental decrees, and other normative documents issued by the relevant agencies. The AMAP estimated that there are more than 800 documents regulating environmental protection and natural resources use in Russia.[20] The main legislative basis for offshore hydrocarbon development can be found in the Subsoil Law, the Continental Shelf Law, the Exclusive Economic Zone Law, and the Environmental Protection Law.[21] The Subsoil Law requires that license holders on the continental shelf blocks be legal entities with at least five years of experience operating on the Russian continental shelf and that Russian State owns more than 50 percent of its shares.[22] The petroleum regulation system in Russia is highly prescriptive and State-centric. The State governs offshore petroleum production through the Ministry of Energy (Minenergo) and the Ministry of Natural Resources and Environment (Minprirody). While generally, resource development is under the joint competence of federal and regional authorities, Arctic offshore fields are exclusively subject to federal regulation.[23]

Environmental regulation of offshore petroleum activities in Russia is primarily based on the Environmental Protection Law and the relevant provisions of the Subsoil Law and the Continental Shelf Law. The Environmental Protection Law does not contain any specific provisions for northern development.[24] It is largely based on the polluter-pays principle and includes economic incentives for companies to limit their pollution (Art. 16).

The Subsoil Law establishes State supervision to prevent safety and environmental violations (Art. 38). The Federal Service on Supervision in the Sphere of Natural Resources Use (Rosprirodnadzor) monitors compliance with environmental regulations and licences. Rosprirodnadzor issues safety rules for equipment and processes for offshore petroleum development.[25] Sidortsov highlights the lack of Arctic-specific norms in Russian petroleum regulation with the exceptions of some provisions on operating in ice and cold weather conditions.[26] Indeed, the Rosprirodnadzor rules prescribe that drilling must cease in the presence of floating ice or a storm;[27] decisions regarding the construction and exploitation of ice-resistant platforms must be made considering their performance in low temperatures and the presence of ice.[28] Rescue operations must consider evacuation equipment and procedures in ice conditions.[29]

There have been reports of developing Arctic-specific standards for materials used in offshore petroleum exploration and production,[30] but none have been adopted so far.

Regulation of petroleum development in the Russian Arctic is, in principle, different from that in the other Arctic states due to its highly prescriptive nature. The difficulty with such an approach is that the legislation might not keep up with the rapid development of technology in the offshore industry.[31] This means that prescriptive standards may not be sufficiently up-to-date to address current issues, much less evolving ones. However, with the growing interest in developing Arctic offshore resources and the ever-developing legal framework, there is room for the adoption of higher standards and more specialised rules.

How Adequate Has Russian Participation Been in Global and Regional Pollution-related Agreements?

Russia is a member of the Arctic Council and the Barents Euro-Arctic Council. It cooperates closely with Norway, with whom it shares terrestrial and maritime borders. Russia's relations with other Arctic states have been hampered by the 2014 Russian annexation of Crimea and the ongoing Ukrainian crisis.[32] The EU and U.S. adopted economic sanctions that prohibit Western companies to sell, supply, transfer or export technology to Russian companies for the purposes of oil development in the Arctic.[33] Despite that, cooperation over Arctic affairs has been largely unaffected. In

the domain of Arctic affairs, Russia remains as cooperative as ever.[34]

Russia is a party to almost all international Arctic-related pollution prevention and mitigation treaties. These are examined below.

Marine oil pollution

Russia is party to the UN Convention on the Law of the Sea, and to both general[35] and Arctic-specific oil pollution-related agreements.[36] Russia has also been participating in Arctic Council-led initiatives on oil pollution prevention, such as the Arctic Offshore Oil and Gas Guidelines[37] and the Task Force on Oil Pollution Prevention.[38]

For the most part, Russia complies with treaty requirements regarding oil pollution cooperation. These include the requirement for an oil-spill response plan, international cooperation in response operations, participation in exercises, and procedural requirements on how to notify neighbouring States about an accident and to request/provide assistance.[39]

However, Russia is the only Arctic offshore oil-developing State that does not have a relief well policy, which would require a second rig to be available to drill a relief well in case of a blowout. The Arctic Offshore Oil and Gas Guidelines include relief well arrangements as a necessary element of oil-spill planning. This is because, in the case of a blowout, it is imperative to stop the uncontrolled flow of oil as soon as possible, and definitely before the drilling season ends due to incoming ice.

Air pollution

Russian participation in the air pollution prevention treaties is not as comprehensive as it is with maritime oil pollution cooperation. Russia is party to the Convention on Long-Range Transboundary Air Pollution (CLRTAP),[40] but has not ratified a number of protocols, which require quantitative emission reductions.[41] With regards to climate change, Russia is party to the UNFCCC[42] and to the Paris Agreement.[43] Given Russian refusal to undertake emission limitations within the second commitment period of the Kyoto Protocol and a strong industry lobby, this is not entirely surprising.[44]

In contrast, Russia has been active in the Arctic Council's non-binding Black Carbon and Methane Framework.[45] Thus, it participated in a number of projects directed at mitigating Black Carbon and funded by the Council's

Project Support Instrument, such as joint United States-Russia initiatives to update the bus fleet in the Murmansk area[46] and energy upgrades to off-grid cluster settlements in Karelia.[47]

Finally, Russia is a party to the Stockholm Convention on Persistent Organic Pollutants;[48] and has signed but not ratified the Minamata Convention on Mercury.[49]

Generally, Russian participation in international environmental governance is active and cooperative. Compared to Scandinavian countries, however, the obligations that Russia has assumed under these agreements are not as ambitious. It appears that agreements requiring quantitative emission reductions are less attractive to Russian officials than those regarding general cooperation and knowledge sharing.

Challenges and Successes

The acknowledgment of environmental problems in Russian Arctic policy is a step forward compared to Soviet times, when environmental problems were marginalized.[50] However, translating policy into effective legislation is a step yet to be taken by Russian authorities. Legal standards for the petroleum and mining industries need to be made more stringent, but also must move away from ineffective and slow prescriptive regulation, which is a legacy of the Soviet legal system. This highly prescriptive system also comes with contradictory regulations and a lack of compliance enforcement.[51] In the Arctic resource development context, there is room for legislative reforms that can help shift from prescriptive to hybrid systems, such as those used for Arctic developments in the U.S. and Canada. International industry standards and regional cooperation under the Arctic Council agenda, such as the Offshore Regulators Forum, could facilitate the necessary knowledge and experience transfer. Russia is participating in a number of international initiatives directed at minimizing maritime and air pollution but is reluctant to undertake quantified binding emission reduction targets.

Notes

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PART VI

THE ROLES OF NON-ARCTIC STATES IN THE ARCTIC

China's Performance after Being Accepted as an Observer in the Arctic Council

Yang Jian

China formally submitted its application for observer status in the Arctic Council in December 2006. Since then, China has been actively participating, as an ad-hoc observer, in almost all senior official meetings of the Council. China was accepted to the Arctic Council at the Kiruna ministerial meeting in 2013, together with other Asian applicants and Italy. Because of the huge size of China's economy and its growing influence in other areas, China's role, responsibility and influence in Arctic affairs have attracted the attention of Arctic countries and some stakeholders. In early 2018, the Chinese Government issued a white paper entitled "China's Arctic Policy," which systematically set out China's principles, positions and main concerns in the Arctic. The Chinese government's white paper was designed to play a role in enhancing international trust and reducing misperceptions, but there are also some different interpretations.

This paper seeks to investigate and sort out China's participation in Arctic affairs since 2013 in order to analyze the development track of China's Arctic policy.

"Be Part of It, But Never Overstep": China's Arctic Policy

By summing up the white paper on China's Arctic Policy and the statements made by Chinese officials on the Arctic Council, Arctic Frontiers, and the Arctic Knowledge Tour, we can observe that China's position mainly focuses on its views on Arctic affairs, its understanding and attitude toward the Arctic Council, and its understanding of relations between Arctic and non-Arctic countries. To clarify the relevance of China to Arctic affairs and China's contribution to Arctic governance, several points can be summarized as follows:

- In the light of the accelerated melting of Arctic ice and snow, the need for governance on climate change and environment protection is becoming more pressing. The possibility of Arctic economic development in the near future intertwines Arctic affairs with

two strong, and sometimes oppositional, forces (protection and exploitation). In order to address the needs of Arctic governance, Arctic countries and non-Arctic countries that share a common concern about the future of the Arctic need to explore the Arctic/non-Arctic interface with regard to issues affecting the future of the Circumpolar North and to develop an efficient cooperative partnership based on mutual respect, trust, interaction, and benefits.

- The sovereignty, sovereign rights and jurisdiction of Arctic countries in the Arctic region and their substantial interests in the Arctic should be recognized and respected. At the same time, non-Arctic countries also have rights and interests in navigation and scientific research in the Arctic. The guiding principle of cooperation between Arctic and non-Arctic countries should be a commitment to peace, stability and sustainable development in the Arctic.
- The Arctic Council is the most important and principal high-level regional intergovernmental forum on the Arctic environment and sustainable development. It plays a key role in coordinating Arctic scientific research, promoting Arctic environmental protection, and promoting cooperation in economic and social development in the Arctic region. China hopes that Arctic states and the Arctic Council will adopt an open and inclusive attitude toward the cooperation between Arctic and non-Arctic States to effectively resolve the relevant issues.

In January 2018, the Chinese government released a White Paper entitled "China's Arctic Policy" (PRC State Council, 2018). At the press conference, the vice minister of Ministry of Foreign Affairs of China, Kong Xuan, used the phrase "Be part of it but never overstep" (不缺位,不越位) to describe China's policy and its relations with Arctic affairs. *Never overstep* means that the secondary will never supersede the primary and that China will not regard itself as an Arctic country. It will not assume the responsibilities, claim the rights, or interfere with the affairs that belong to and should be handled by Arctic countries. *Be part of it* means China can play roles in accordance with the requirements of the observer states of the Arctic Council, the requirements of United Nations norms, and with the rights and obligations granted by relevant international law. China's role in Arctic affairs is to *supplement and to cooperate, not to replace*.

Two phrases in China's white paper have drawn attention. One is

Polar Silk Road, which was explained in my paper included in NPAC 2018 proceedings volume.[1] Here I would like to quote one paragraph from this paper: *The Polar Silk Road is not only a part of China's BRI initiatives but also a contribution to the joint efforts by Arctic nations, international organizations, and other stakeholders for Arctic governance and the coordination of Arctic policies for developing and protecting the Arctic.*

Another phrase is "near-Arctic state." U.S. Secretary of State Mike Pompeo displayed his discontent with China during the Ministerial meeting in 2019 in response to Beijing's claims to be a "near-Arctic State." He said, "There are only Arctic States and non-Arctic States. No third category exists, and claiming otherwise entitles China to exactly nothing."

However, both in terms of geo-climate, geo-environment, and geo-economy, China is an important stakeholder in Arctic affairs. What's more, an increase in telecoupling is a feature of the earth system in the Anthropocene. China's statements with regard to being a near-Arctic state illustrate that China regards itself as a non-Arctic state and emphasizes the fact that China is an important stakeholder in the Arctic. Among the non-Arctic countries, there are indisputably some countries that are more relevant to Arctic affairs. That is the reason why the Arctic Council set certain criteria for selecting some countries as observers of the Arctic Council, rather than allowing all countries to be observers.

In addition to China, other non-Arctic countries, such as the United Kingdom, have made similar expressions of interest. The reasons behind these countries' statements are similar to those of China. In its document, the UK government says "The UK is the nearest neighbour to the Arctic" and it would like to step up the UK's engagement.[2]

An Overview of China's Participation and Performance in the Arctic Council

The Chinese Government attaches importance to the development of positive interaction and cooperation with the Arctic Council and respects the leading role of the Arctic Council and the eight Arctic countries in Arctic affairs.

In its white paper, the Chinese government stated that China stands by the commitments it made when applying to become an observer to the Council. It fully supports the work of the Council, and dispatches experts

to participate in the work of the Council, including its Working Groups and Task Forces. According to the manual of AC observers, China continues to contribute to the work of the Arctic Council as an observer. China has attended all the governmental meetings open to observers under the umbrella of the Arctic Council, such as the Ministerial meetings, Senior Arctic Officials (SAO) meetings, International Meetings of States-Members of the Arctic Council, States-Observers to the Arctic Council and Foreign Scientific Community, Arctic Science Ministerial meetings, etc. China appointed Gao Feng as the first Special Representative for Arctic Affairs of the MFA on 2nd November 2016. Gao also acts as China's senior Arctic official to the Council to further enhance China's contribution to the Council.

China has attended meetings of the Working Groups, Task Forces and Expert Groups of the Council, including the meetings of PAME working group, CAFF working group, AMAP working group, and the Scientific Cooperation Task Force (SCTF). China has recommended more than 30 experts to relevant programs; eight of them have been invited to engage in specific programs: two experts for the Global Ocean Acidification Observing Network of PAME, two experts for recommendation and reviewing relevant reports of the Arctic Contaminants Action Program (ACAP), three experts for the Arctic Contaminants Action Program (ACAP), three experts for the Arctic Migratory Birds Initiative (AMBI) of CAFF, and one expert for the Adaptation Actions for a Changing Arctic (AACA) of AMAP. Several concrete suggestions and contributions were made to relevant projects from the Chinese experts. China has established a pool of experts ready to participate in the work and projects of the Council once invited, including 13 experts for PAME, 18 experts for AMAP, three experts for CAFF, five experts for ACAP, four experts for SDWG, and two experts for EPPR.

Although China is a newcomer as an observer of the Arctic Council, it is accumulating experience and familiarity with the Council's work and protocols. Chinese representatives and experts have maintained good working relations with the Arctic Council in all aspects. China is satisfied with its position in the Arctic Council. The role that China has played is complementary. Participation in the work of the working groups is gradually integrated. Due to the lack of experience and domestic procedure of overseas travel management in China, many Chinese research institutes can not guarantee that the most suitable experts are able to continuously participate in all the activities of the Working Groups. There is an old saying in China that translates as, "going far requires steady and unhurried

steps." It is believed that China's participation in activities at the working group level of the Arctic Council will be gradually promoted.

China's Multi-channel Approach to Engagement in Arctic Affairs

The Arctic Council is the principal high-level forum dealing specifically with Arctic matters. But the Arctic Council does not constitute the only channel of engagement regarding Arctic issues of interest to non-Arctic states. In its white paper, the Chinese government mentioned that China plays a constructive role in the work of the International Maritime Organization, and China emphasizes co-operation through platforms such as the International Arctic Science Committee (IASC). Chinese scientists are encouraged to conduct international academic exchanges and deepen involvement with the University of the Arctic. China supports the participation of all Arctic stakeholders in Arctic governance and international cooperation. China welcomes more inclusive, comprehensive and diversified cooperation with all relevant stakeholders regarding Arctic affairs. China supports platforms such as "The Arctic: Territory of Dialogue," "The Arctic Circle," "Arctic Frontiers," and "The China-Nordic Arctic Research Center" in promoting exchanges and cooperation among stakeholders. All these mean that China has adopted a multi-channel approach to engage in Arctic affairs.

The International Arctic Scientific Committee (IASC) is a non-governmental Arctic scientific coordination organization established in 1990 by the eight Arctic countries. Its purpose is to formulate plans for Arctic scientific research and environmental protection and to coordinate, organize and promote scientific research, environmental protection, and academic exchanges and cooperation among Arctic countries. It has become an important platform for carrying out scientific diplomacy, making it an important platform for solving a series of Arctic problems. The International Arctic Scientific Committee currently has 23 members, including eight Arctic countries and 15 non-Arctic countries' national academies or research councils. Yang Huigen, a Chinese scientist, is a vice chairman of IASC. In March 2019, seven members of the IASC Executive Committee met in Shanghai to discuss the direction and agenda of the future work of the International Arctic Scientific Committee.

The Arctic Circle has, since it was established in 2013, become a leading venue for international talks on the Arctic. The Arctic Circle held a Forum on May 10-11 2019 in Shanghai with the title "China and the Arctic." The Polar Research Institute of China (PRIC), the Shanghai Institutes for International Studies (SIIS), and the secretariat of the Arctic Circle combined to organize the Forum. Significant discussion was held on ocean and marine science, transport and infrastructure, renewable energy, geopolitics, and Arctic governance.

China sent a high-level delegation to attend the fourth and fifth "The Arctic: Territory of Dialogue" conferences held in Russia. Chinese Vice Premier Wang Yang said in this venue that China adheres to the three major policy concepts of respect, cooperation, and sustainability to participate in Arctic affairs. As conditions evolve, we should strengthen protection of the Arctic environment, constantly deepen scientific exploration, rationally develop and utilize Arctic resources in accordance with the law, and improve the Arctic governance system.

A seminar entitled "Green Solutions for a Sustainable Arctic" was held in Shanghai on 18 October 2018. It was organized by Arctic Frontiers in cooperation with the Royal Norwegian Consulate General in Shanghai, Shanghai Institutes for International Studies, and the Polar Research Institute of China, focusing on questions such as how technology and connectivity might enhance resilience in Arctic communities and promote a green economy.

To facilitate and provide a platform for academic cooperation on the Arctic, four Chinese and six Nordic institutions dedicated to Arctic research established the China-Nordic Arctic Research Centre (CNARC) in Shanghai in December 2013. The establishment of CNARC was done with the purpose of "building the bridge" and "filling in gaps of knowledge" so that both China and Nordic countries have an enhanced understanding of each other. Its work helps China to understand major issues with regard to Arctic governance, to figure out main concerns of the Arctic states, to make up for lack of relevant knowledge, and attempt to construct an innovative cooperative model between Arctic and non-Arctic states.

Enhancing bilateral and multilateral dialogue and cooperation among Arctic States and non-Arctic States is another of China's approaches. China has set up an annual dialogue mechanism for bilateral dialogues with both Russia and the United States.

Cooperation with Nordic countries has been very impressive. At the

invitation of Finnish President Sauli Niinistö, President Xi Jinping paid a state visit to Finland in April 2017. The leaders confirmed the establishment of a future-oriented new-type cooperative partnership between the two countries. The Joint Declaration mentioned that, given the vulnerability of the Arctic environment, the two sides shared the view that economic activities in the Arctic region should take into full consideration the protection and sustainable use of its natural resources. The two countries will intensify economic and technological cooperation in the fields of Arctic marine industry, Arctic geology, marine and polar research (including polar weather and sea ice monitoring and forecasting), environmental protection technology, shipping and maritime safety, including vessel monitoring and reporting, ICT and tourism. During President Niinistö's visit to Beijing in January 2019, the two sides adopted a five-year plan for bilateral cooperation. China's second icebreaker *Xuelong 2* (雪龙 2), that was constructed in partnership with the Finnish shipbuilding firm Aker Arctic, started her service as an advanced polar research vessel in May 2019.[3]

Chinese President Xi Jinping also met with Norwegian Prime Minister Erna Solberg in Beijing on April 10, 2017. Xi expects Norway to play a more positive role in promoting cooperation between China and the Nordic region, saying that China will deepen cooperation with Norway in Arctic research, resource exploration, and environmental protection. Prime Minister Solberg said that the Norwegian government supports the Belt and Road Initiative and is ready to expand cooperation that will produce mutual benefits in areas that include Arctic issues, and will cement communication and coordination on global issues.

China also values cooperation with other non-Arctic States. It has conducted bilateral dialogues on the Law of the Sea and polar issues with the United Kingdom and France. In 2016, China, Japan, and the Republic of Korea launched high-level trilateral dialogues on Arctic issues to promote exchanges on policies, practices, and experiences regarding Arctic international cooperation, scientific research, and commercial cooperation.

The Third Trilateral High-Level Dialogue on the Arctic was held on June 8, 2018 in Shanghai. Special Representative for Arctic Affairs of the Ministry of Foreign Affairs of the People's Republic of China Gao Feng, Ambassador for Arctic Affairs of the Ministry of Foreign Affairs of the Republic of Korea (ROK) Kang Jeong-sik, and Ambassador in charge of Arctic Affairs at Japan's Ministry of Foreign Affairs Eiji Yamamoto attended the dialogue. The three countries recognized the global challenges

and international impacts brought about by the changes in the Arctic and expressed willingness to continue to contribute to the peaceful, stable, and sustainable development of the Arctic. The three countries welcomed the white paper on China's Arctic Policy, which had been officially publicized that January by the Chinese government, and agreed to make scientific research in the Arctic a priority for cooperation. They all expressed that they will continue to support the work of the Arctic Council. The three countries issued a joint statement after the meeting.

How to Perceive U.S. Secretary of State Pompeo's Speech about China?

U.S. Secretary of State Mike Pompeo criticized China during the Arctic Council's Ministerial meeting in May 2019. He said that China could use its civilian research presence in the Arctic to strengthen its military presence. My personal perspectives on Pompeo's remarks are as follows:

(1) The restrictions imposed by the United States on China in Arctic affairs are not limited to the Arctic, but reflect a larger shift in American policy. In other words, the United States now treats China as a strategic opponent, and the Trump Administration does not welcome any Chinese move to play a greater role in international affairs. This basic policy is bound to be reflected in Arctic affairs. Therefore, Pompeo's criticism of China on the Arctic issue is only part of the current U.S. administration's comprehensive containment policy.

(2) It is illogical for the United States to accuse China of trying to provoke geographical tensions and competition in the Arctic because China cannot benefit from security tensions in the Arctic. China was, is, and will be the beneficiary of peace and stability in the Arctic. Given that China stands to benefit from Arctic shipping, oil and gas development, and scientific research, maintaining peace and reducing geopolitical and security disputes in the Arctic is beneficial to China.

(3) It shows that the pivot of the current U.S. administration in Arctic affairs has shifted from an emphasis on the climate issue in the Obama administration to today's geopolitically based Arctic diplomacy, which deserves the attention of China and other

countries. The Obama administration made climate change and environmental governance an important issue, and the Arctic is a key region where climate change impacts are already apparent and are projected to become more widespread. In fact, it was the Obama administration that succeeded in persuading China to participate in the Paris climate agreement and to take the initiative to assume responsibility. Moreover, Secretary Pompeo's insistence that any reference to climate change be excised from the Council's statements only served to further isolate the current U.S. administration – and created for the first time in the Council's history a failure to reach consensus on a joint declaration.

(4) China has a huge economy on the world economic stage. Understandably, it will receive more attention than other non-Arctic countries in Arctic affairs. The size of China's economy and its involvement in the Arctic are likely to cause widespread concern. This requires continuous communication and coordination between China and other stakeholders.

Notes

1. Yang Jian and Henry Tillman, "Perspective from China's International Cooperation in the Framework of the Polar Silk Road," in *The Arctic in World Affairs: A North Pacific Dialogue on Arctic 2030 and Beyond—Pathways to the Future*, eds. Robert W. Corell et al. (Seoul: KMI and East-West Center, 2018), 275-292.
2. Secretary of State for Foreign and Commonwealth Affairs, "Government Response to the House of Lords Select Committee Report HL 118 of Session 2014-15: Responding to a changing Arctic," July 2015. http://www.parliament.uk/documents/lords-committees/arctic/50434_Cm%209093_accessible.pdf
3. In 2012, Aker Arctic was contracted by the PRIC to provide the concept and basic design for a polar research vessel. The construction commenced in the Jiangnan Shipyard (江南造船公司) in Shanghai and completion of the 122m-long Polar Class 3 icebreaker is scheduled for 2019. Aker Arctic advertises the icebreaker it designed as "the world's most advanced polar research vessel."

Japan's Arctic Policy and Observer Status in the Arctic Council

Natsuhiko Otsuka

A Brief History of Japan's Arctic Policy Formation

After being an ad-hoc observer of the Arctic Council (AC) since 2009, Japan was admitted as a permanent observer in the AC at its 8th Ministerial Meeting in 2013. Once admitted, the Japanese Ministry of Foreign Affairs announced that Japan would attend various meetings of the AC and contribute to the work of the Council by cooperating with AC member states and Arctic Indigenous Peoples, as well as through Japan's participation in Working Groups of the Council.[1] In the same year, the Ministry of Foreign Affairs appointed an ambassador in charge of cultural exchanges, who would concurrently be in charge of Arctic affairs. At about the same time, Japan's cabinet adopted the *Second Basic Plan on Ocean Policy*, which outlines policy and strategy regarding the Arctic Ocean for the first time in Japan's history. In July 2013, a "Liaison Conference of Relevant Ministries and Agencies for Arctic Issues"[2] drafted Japan's formal Arctic Policy.

In response to growing international interest in the Arctic, not only with regard to global warming but also to maritime shipping, natural resource development, and international governance in the Arctic Ocean, in 2015 the Headquarters for Ocean Policy in the Cabinet Office of Japan adopted "Japan's Arctic Policy" based on the Second Basic Plan on Ocean Policy. The initiatives of the policy include the fields of diplomacy, national security, environment, resource development, and science and technology, with a multidisciplinary perspective that includes contributions from industry, academia, and the government. In 2018, *The Third Basic Plan on Ocean Policy* was approved. Here, the task of "Promoting Arctic Policy" was stated as one of the six main measures for the first time in "The Basic Plan on Ocean Policy." This paper aims to summarize Japan's Arctic policy and discuss the pros and cons of having observer status in the AC.

Arctic Issues in Japan's Basic Plan on Ocean Policy

The *Second Basic Plan on Ocean Policy*, which was approved on 2013 based on the Basic Act on Ocean Policy (Act No.33 of April 27, 2007), formulated six main measures: promotion of marine industries, securing safety and security, promotion of marine surveys and integration of marine information, developing human resources, management of sea and formulation of plans, and other important measures. In the "other important measures," the Arctic was mentioned for the first time in the formulation of Japan's cabinet decisions. Following this principle, the plan intended to implement observations, surveys, research and other activities in the Arctic by taking into account the fact that the region would have a great impact on Japan's climate as well as on the rest of the world. In addition, measures aimed at future use of Arctic sea routes were also mentioned. Furthermore, it was declared that the government should make concerted efforts to gain observer status at the AC.

Then, the Headquarters for Ocean Policy approved the *Third Basic Plan on Ocean Policy* in 2018. In this latest plan, maritime security and eight other ocean measures were highlighted. These include promoting the industrial use of the ocean, maintaining and conserving the marine environment, strengthening the capacity for maritime domain awareness, promoting research and development for ocean surveys and marine science and technology, preserving remote islands and developing EEZs, promoting Arctic policies, ensuring international collaboration and promoting international cooperation, developing human resources and promoting domestic understanding of Arctic issues.[3]

Here, the Arctic was taken up as a central organizing principle for the first time in Japan's ocean policy. In the Basic Plan, three pillars—research and development, international cooperation, and sustainable use—were taken up as specific measures of Arctic policy. Included in "international cooperation" is a goal to strengthen Japan's contributions to the activities of the AC.

Thus, Japan has been formulating its Arctic policy measures through the Basic Plan on Ocean Policy in parallel with Japan's Arctic Policy, which was formulated in 2015.

Japan's Arctic Policy

In 2015, the Headquarters for Ocean Policy approved "Japan's Arctic Policy."[4] In the policy, Japan aimed to become a main player that actively participates in international Arctic initiatives and contributes to Arctic issues by making "proactive contributions to peace" that are based on principles of international cooperation. The policy sets strategic initiatives for diplomacy, national security, environment, transportation, resource development, information and communications, and science and technology, using a multidisciplinary approach that includes perspectives from industry, academia, and the government.

At the Arctic Circle 2018 meeting in Reykjavik, Japan's Minister of Foreign Affairs, Taro Kono, outlined the idea of an "ideal Arctic," based on the following three elements[5] included in Japan's Arctic Policy:

- The mechanisms contributing to environmental changes in the Arctic must be clarified and better understood, and the necessary responses to these changes must be shared with the international community. We need to further advance scientific research.
- Sustainable economic activities are to be pursued in the Arctic, while respecting the ecosystem and the lives of Indigenous Peoples.
- "The rule of law" must be ensured and international cooperation must be promoted in a peaceful and orderly manner.

The adoption of Japan's Arctic policy was slower to take form than the other non-Arctic observer states of the AC. Thus, Japan could review all the Arctic policy documents that other countries had implemented or proposed prior to formulating its own positions. To serve industry, academia, and the government, the policy considers multiple issues based on various interests. As a result, the Japan's Arctic Policy could be a typical showcase for Arctic policy measures. This approach could be summarized in several principles: responding to global warming and the changing Arctic environment, making scientific contributions, promoting international cooperation and contributions to Arctic nations, ensuring sustainable use of the Arctic, and developing natural resources and Arctic sea routes.

Above all, the characteristics of Japan's Arctic policy could be found as follows:

- The Headquarters for Ocean Policy (a cabinet-level position) formulates two Arctic related policy documents: the Basic Plan on

Ocean Policy, and Japan's Arctic Policy.
- Ocean-related policy is emphasized as the most significant field in Japan's Arctic Policy.
- Previously, there was no agency that specialized in the Arctic. Today, under the leadership of Headquarters for Ocean Policy, related ministries and institutions are asked to implement measures on Arctic issues.

Japan As a Permanent Observer of the AC

Scientific activity

A large part of Japan's Arctic-related activity is in the scientific domain. The Ministry of Education, Culture, Sports, Science and Technology had implemented the national GRENE Arctic Climate Change Research Project[6] from 2011 to 2016. This project was followed by the Arctic Challenge for Sustainability (ArCS) project (2015-2019).[7] The ArCS is Japan's flagship research project in the Arctic, which covers a wide range of scientific fields, including climatology, physical oceanography, marine biology, geography, ocean engineering, anthropology, political science, data science and others. The ArCS also aims to elucidate the changes in the climate and environment, clarify their effects on human society, and provide accurate projections and environmental assessments for internal and external stakeholders. In this regard, the AC could be one of the most important and the largest stakeholders for the ArCS. Under the ArCS, Japanese scientists have been participating in AC's working group of CAFF, AMAP, PAME, SDWG and some expert group activities/projects as well. Though being an observer under "the Rules of Procedure"[8] of the AC, these scientists have had a chance to make remarks in those working group meetings and join the activities. Through these activities, Japan has been able to exchange information and ideas of interest to other Arctic stakeholders.

However, in comparison with other international cooperative activities concerning the Arctic that do not place limits on non-Arctic members, this observer status that Japan and other countries hold can limit observer nations' motivation to contribute, even if one or more of those observer nations promotes very good ideas or plans that can help achieve AC's objectives. In any case, the scientific fields provide the greatest chance for

Japan to join the AC's activities, and enables Japan to enhance its presence among Arctic nations.

Emerging interest and commercial activity in the Arctic

Against the background of emerging shipping activity along the Northern Sea Route (NSR) and natural resource development along the Russian Arctic coast since 2010, Japan's shipping business sectors have gradually been increasing their interest in the Arctic. So far, the Chinese shipping company COSCO Shipping carried out three shipping attempts of goods via the NSR from Europe to Hokkaido region in Japan since 2017, by 36,000DWT bulk carrier. In 2019, 20, 40-foot containers of lumber

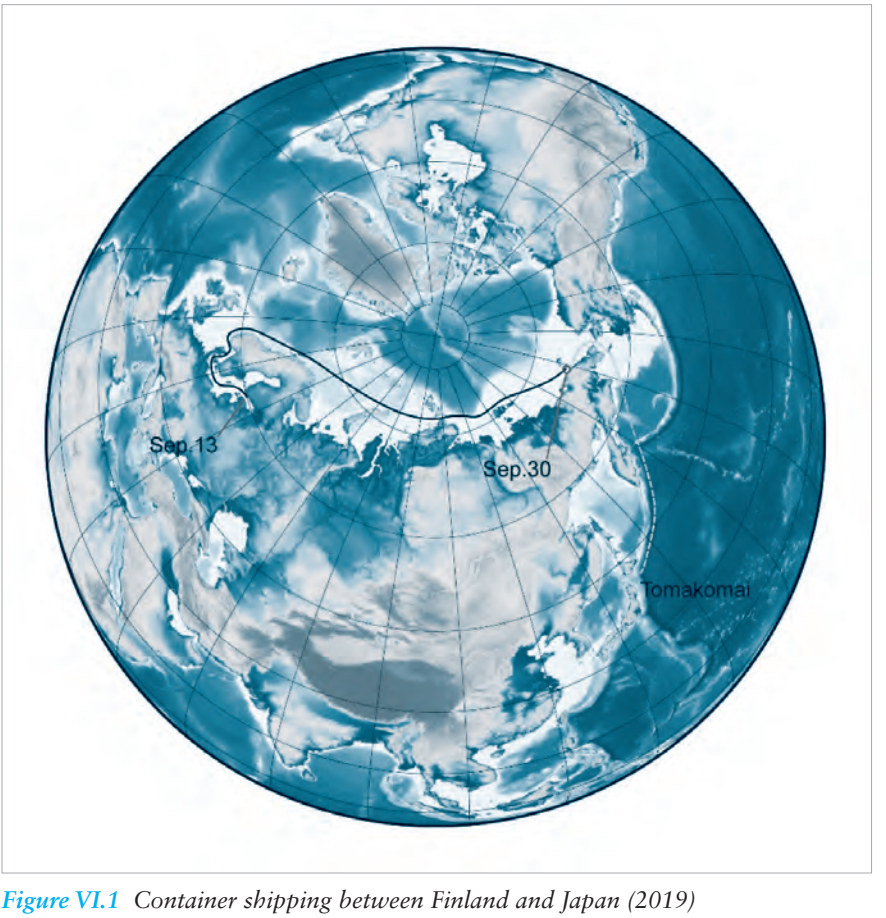

Figure VI.1 Container shipping between Finland and Japan (2019)

were shipped from Finland to the Port of Tomakomai by one of COSCO Shipping's general cargo ships. This was the second attempt in the history of the NSR to ship containers, and the first container-shipping attempt for commercial purposes (Figure VI.1).

LNG projects in the Arctic have been the most pressing issue for Japan's Arctic activity. Mitsui O.S.K. Lines became a part owner of three icebreaking LNG carriers for Yamal LNG, together with COSCO Shipping. The Japan Bank for International Cooperation, Japan Oil, Gas and Metals National Corporation, Mitsui & Co., Ltd. and Mitsui O.S.K. Lines also decided to participate in the Novatek's forthcoming Arctic LNG 2 Project and related projects in Kamchatka and Murmansk Oblast.[9,10]

In parallel with Japan's emerging interest in the Arctic as stated above, Japan's Arctic policy places greater emphasis on commercial use of the Arctic. The Ministry of Land, Infrastructure, Transport and Tourism brought up Arctic shipping issues in the intergovernmental meetings among Russia,[11] Korea, and China.[12] At the same time, in order to serve the interest of the national industry sector in a sustainable manner, Japan emphasizes its desire to be appropriately involved in international discussions regarding Arctic development, including documenting best practices, appropriate governance, and ensuring the sustainability of local communities. Together with the importance of documenting the rapidly changing Arctic environment, Japan decided to co-host the 3rd Arctic Science Ministerial with Iceland, which will take place in Tokyo in 2020.

Multi-level international agreements and regulations regarding the Arctic

There are multiple levels of stakeholders interested in Arctic issues (such as bi-lateral, multi-lateral, regional, and international). In addition, there are multiple levels of intergovernmental agreements defining Arctic issues. This could be categorized as follows (Table VI.1):

- Bilateral and multi-lateral agreements between Arctic States
- International agreements/regulations for the Arctic
- International rules/agreements that could apply to the Arctic

Among these levels of activities, the AC would be the most powerful and comprehensive body to promote discussion and international cooperation in the Arctic. However, it is limited to regional levels of

Table VI.1 *Multi-level international agreements and regulations*

	Political circumstances of Arctic Council and emerging interest	Bilateral, multi-lateral agreements/ rules between Arctic States	International agreements/ regulations for the Arctic	International rules/ agreements that could have relations to the Arctic	AC observers
~	Establishment of cooperative body among Arctic States **envirnment,* **sustainability* **global warming*	1987: Gorbachev's speech in Murmansk; opening NSR etc.	1973: The Agreement on the Conservation of Polar Bears		
1990 ~		1991: The Arctic Environmental Protection Strategy (AEPS, Finish Initiative)	1990: The International Arctic Science Committee (IASC)		
	Accelerating climate change Achieving Arctic governance among Arctic States. Increasing interest from Non-Arctic States **Warming Arctic* **Natural resources* **Shipping route*	1996: The Ottawa Declaration, AC		1994: United Nations Convention on the Law of the Sea	1998:UK, Germany, Holland, Poland
2000 ~				2001: Agreement Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks	2000: France 2006: Spain
		2008: Ilulissat declaration, 2008,2010: Arctic ocean Conference			
2010 ~	Accelerating climate change Geopolitical transformation with advancing non-Arctic States **Maritime safety* **Commercial*	2011: the Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic			
		2013: Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic			2013: China, India, Italy, Japan, Korea, Singapore
		2014: Arctic Economic Council 2017: agreement on Enhancing International Arctic Scientific Cooperation	2017: IMO Polar Code 2018: CAOF Agreement		
2020 ~		~among Arctic states			
		Arctic States between non-Arctic States			
		Cross border environmental issues (i.e.; marine plastics, underwater noise,			

discussion due to the limited number of member states.

The Arctic Policy, which was implemented by Arctic and non-Arctic Nations (including Japan), notes some emerging topics, such as freedom of research in the Arctic Ocean, freedom of navigation in the Arctic Ocean, and fishing in the Central Arctic Ocean. Though the AC could be one of the most important bodies to discuss these topics and achieve international harmonization of policies and regulatory procedures among the Arctic Nations, discussions of these topics cannot be complete if only Arctic Nations participate. Repeatedly, the Japanese government made reference that Japan needs to be appropriately involved in international discussions regarding the Arctic, since Japan is both a maritime state and a country that attaches much importance to global environmental issues. In this regard, the AC could not fully represent Japan's concerns if Japan were limited to participate only as an observer of these discussions and negotiations. At this moment, Japan is not expecting an institutional re-arrangement of its observer status of the AC. Instead, the Council should consider more active involvement of Arctic observer states in a way that allows observers a chance to express opinions and formulate frameworks for binding agreements.[13]

Expected Observer Roles of Japan

To follow the Rules of Procedures of the AC, the principle role of Japan as an observer state of the AC continues to be:

- To expand/upgrade AC's activity level by participating as a party that shares responsibility for the conservation of the Arctic.
- To participate in member discussions about regional governance and utilization of the Arctic.

Based on Japan's Arctic Policy, the Arctic-related governmental entities of Japan (such as Ministry-related work and the product of research institutions) are engaging to achieve social implementation of renewed scientific efforts. These efforts should then be considered and reflected in environmental policy measures and commercial activities in response to the various Arctic stakeholders' requirements. At the same time, scientists are requested to help benefit Japan's diplomatic activity through their scientific achievement and international cooperation. For example, the

satellite monitoring data service of the Arctic[14] could serve not only the international scientific community, but also Japan's scientific diplomacy. In this regard, the working group activity of the AC could provide an important opportunity for scientists to share their achievements with stakeholders in the Arctic. Japan's Arctic research projects are beginning to make clear contributions to the AC, in collaboration with Arctic communities.

Summary

- Japan's Arctic Policy is organized under the framework of Japan's Ocean Policy, and measures are promoted by the Headquarters for Ocean Policy in the Cabinet Office.
- Japan's latest Basic Plan on Ocean Policy promotes Arctic policy comprehensively and systematically as principal measures. Three pillars of this policy—research and development, international cooperation, and sustainable use—were formed to respond to specific measures. This includes strengthening contributions to the activities of the AC.
- Japan has been placing emphasis upon AC's working group activities. Under the national Artic research project (ArCS), scientists have been participating in working groups and some expert group activities. Through these activities, Japan can exchange information and develop network with the actual Arctic stakeholders. However, compared with other international cooperative activities of the Arctic, which have little limitations to non-Arctic members, this observer status is limiting Japan's motivation to participate more enthusiastically.
- In order to serve the emerging interests of the industrial sector in a sustainable manner, Japan emphasizes its desire to be appropriately involved in international discussions regarding Arctic development, best practices, appropriate governance, and the sustainability of local communities.
- Being a maritime state and one that attaches much importance to global environmental issues, the AC could not fully benefit from Japan's important contributions and perspectives if it remains limited to being an observer on the sidelines.
- At this moment, Japan is not expecting institutional arrangement of

the observer status of the AC. Instead, the Council should consider allowing more active involvement of Arctic observers in some way that allows observers a chance to express opinions and participate in formulating binding agreements.

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Notes

1. Ministry of Foreign Affairs of Japan, 2013. (Viewed on Jul. 25 2019) https://www.mofa.go.jp/press/release/press6e_000092.html
2. The Liaison Conference consists of Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Foreign Affairs, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Agriculture, Forestry and Fisheries, Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of the Environment, and Ministry of Defense).
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Lessons learned and Future Roles for Korea in the Arctic

Jong Deog Kim

Introduction

The Republic of Korea (Korea) has been involved as an ad hoc Arctic Council observer since 2008. Korea's activities can be divided into Phase 1 and 2, separated by its formal accreditation in 2013. In Phase 2, since 2013, there has been a significant increase in Korea's participation in the Arctic Council (AC) and its subsidiary bodies; Korea barely participated prior to 2013, during Phase 1.

Since joining the Arctic Council as an observer in May 2013, Korea has undertaken various activities to support and contribute to the work of the AC and related issues. Korea recognizes the crucial role the AC has played for the last 23 years as the premier forum on Arctic issues for peace and cooperation throughout the region. The Korean government adopted its 1st Arctic Policy Master Plan in December 2013 as its first comprehensive effort regarding Arctic Policy. In July 2018, the government formulated its 2nd Plan with a view to approach Arctic issues in a more systematic way throughout the government. Those plans were constructed in consultation with and agreement from relevant ministries and research institutes that have domestic roles related to the Arctic.

Master Plans demonstrated the importance of Arctic affairs within the Korean government, with an emphasis on the following goals: i) promoting international cooperation by participating in the AC and other international forums on the Arctic; ii) strengthening scientific research relevant to climate change and environmental protection of the Arctic; iii) exploring new opportunities through cooperation with Arctic States; and iv) developing domestic institutional arrangements for capacity building.

Arctic Council Cooperation

Korea has actively participated in AC working groups, task forces, and expert groups since 2013. Furthermore, in recognition of the unique and

critical role of Indigenous Peoples in Arctic issues, Korea has made efforts to support the Permanent Participants in the Arctic Council. Korea has regularly attended the Senior Arctic Officials (SAO) meetings of the AC, which are held twice a year. The SAO meetings serve as a useful opportunity to keep abreast of current priorities and issues of the AC and introduce Korea's Arctic affairs team, which can help to identify how Korea can connect to the work of the AC. In particular, during the observer session introduced by the U.S chairmanship, which the observers have found very useful, Korea shared its perspectives and contributions that have been undertaken with regard to Arctic affairs and reaffirmed Korea's continued support for the Council's work.

Korean experts have participated in meetings of the working groups (AMAP, CAFF, PAME, EPPR, SDWG), task forces (SCTF, TFAMC), and expert groups (EGBCM); they attended about 30 meetings during the past two years. Members of the Korea Arctic Experts Network (KAEN), which was established in 2014 to include various areas of expertise related to the Arctic, have been engaged in the relevant subsidiary bodies of the AC. Below, I discuss some of the activities conducted by Korean organizations supported or sponsored by the Korean government.

The Korea Maritime Institute (KMI) has held seminars with PAME SEG (Shipping Expert Group) since 2016 to discuss issues and possible projects related to PAME's shipping agenda. Those seminars have helped increase Korean experts' understanding of PAME's activities, and promoted cooperation between PAME SEG and Korea at the expert, institutional and governmental levels. They also allowed the exploration of potential areas or projects where Korea and PAME could collaborate. KMI has been involved in PAME as a project partner in the "Arctic Indigenous Marine Use Mapping (2015-17)" project, led by Aleut International Association (AIA), one of six Permanent Participants in the Arctic Council. This project aims to produce a tool based on established techniques and open-source software that will allow coastal Indigenous communities to produce their own scientifically accurate maps of marine use. Korea provides both financial and in-kind support for this project based on the rules of the AC's observer guidelines. This project was also the first cooperative activity between Permanent Participants and Observer states under the Arctic Council framework (including Korea), and can serve as a useful model for future partnerships.

As for AMAP, experts from the Korea Polar Research Institute (KOPRI)

have been involved in relevant meetings and activities, including SAON (Sustaining Arctic Observing Network). In addition, reported and listed in the Arctic observational inventories on the SAON website are Arctic observational programs conducted by KOPRI such as Arctic expeditions (through the North Bering, Chukchi, and East Siberian Seas) undertaken by the Korean research icebreaker *Araon*, research on tele-connections between the Arctic and mid-latitude climates, and the circum-Arctic permafrost monitoring program.

Korea has also been actively involved in the Arctic Migratory Birds Initiative (AMBI) of CAFF. Korea's National Institute of Ecology (NIE) has been conducting research to examine and accumulate data on the habitat carrying capacity of migratory water birds along their migratory routes and wintering areas. This work has focused on the East Asian-Australasian Flyway, in collaboration with research institutions in Australia and the United States, and the East Asian-Australasian Flyway Partnership (EAAFP) Secretariat based in Korea.

Korea has contributed to the EGBCM (Expert Group on Black Carbon and Methane) as well. Korea voluntarily submitted a national report on black carbon and methane in November 2015. Since then, Korea's National Institute of Environmental Research (NIER) has participated in the EGBCM meetings. Among the five working groups exploring the sources of emissions, Korea took part in the working group on mobile sources and provided expertise and input focusing on diesel.

In relation to EPPR, the Korea Research Institute of Ships and Ocean Engineering (KRISO) is interested in participating in projects on oil-spill prevention and response in the Arctic, given its expertise in the field. KRISO houses the Regional Activity Center under NOWPAP (Northwest Pacific Action Plan) specializing in oil-spill prevention and response. Since Korea has the technology to predict oil-spill trajectories in particular, Korea tried to discuss ways to apply this technology to support oil-spill prevention and response efforts in the Arctic. Korea would also seek ways to participate in the meetings of the Expert Group on Search and Rescue (SAR), which was established by a decision made at the EPPR meeting in October 2015.

KMI has joined the Arctic Renewable Energy Atlas (AREA) project as a partner with the Institute of the North (ION) in SDWG.

With regard to knowledge sharing, KMI has translated reports published by PAME and CAFF such as *Actions for Biodiversity 2013-2021, Arctic Migratory Birds Initiative, and 2015 Progress Report on*

Implementation of the 2009 Arctic Marine Shipping Assessment into Korean in cooperation with the PAME and CAFF Secretariats, and disseminated them in Korea as part of the efforts to raise public awareness of the work of the AC.

Capacity Building

For systematic participation in the AC's subsidiary bodies and comprehensive research, Korea established a pool of Korean scientists and experts, including the Korea Arctic Experts Network (KAEN) and the Korea Arctic Research Consortium (KoARC), who are willing and capable of contributing scientific and other expertise in shipping, oil-spill response, and ecology.

Furthermore, Korea initiated a student exchange program called the Korea Arctic Academy (KAA), in partnership with the UArctic (another observer in the Arctic Council), in order to strengthen Korea's support and engagement with members of future generations in Arctic affairs. By 2019, 150 students were invited to the Academy, including 56 Korean students and 47 Indigenous students. Since 2016, Korean high school students joined an annual outreach program, "the 21C Dasan Juniors," performing lab experiments as well as engaging in field expeditions in Svalbard. In addition, Korea has been conducting graduate student education programs in cooperation with leading universities in the Arctic, including The Arctic University of Norway (UiT), University of Lapland in Finland, and North Eastern Federal University in Russia.

Another noteworthy Korean activity is the North Pacific Arctic Conference (NPAC), which KMI has been hosting annually since 2011 in collaboration with the East-West Center in Hawaii. Bringing together Arctic experts and policymakers around the Pacific region, NPAC provides a valuable opportunity to exchange views and ideas on Arctic issues, and to develop innovative solutions to critical issues in the Arctic.

As part of efforts to enhance public understanding of Arctic culture in Korea, the Korea National Maritime Museum (KNMM) has held Arctic exhibitions in cooperation with partner organizations in the Arctic since 2015. The KNMM partnered with the Fram Museum of Norway in 2015 under the theme, "Meeting Arctic and Antarctic." In December 2016, the KNMM invited the Arctic Center of Lapland University in Finland to

organize an exhibition entitled "The Future of the Arctic."

In view of the significant potential of observer nations to contribute in the Arctic, Korea took the initiative to convene the First Trilateral High-Level Dialogue on the Arctic among Korea, Japan, and China in 2016. The three countries reaffirmed their commitment to contributing to the AC, and agreed to explore ways to cooperate in the field of scientific research in particular.

As a platform of knowledge sharing and communication, Arctic Partnership Week (APW) was established in 2016. APW provides opportunities to discuss issues such as policy, science, shipping, energy, and culture in the Arctic over the course of a week. Organizers support and encourage inviting experts from different areas to enhance mutual understanding.

Regarding economic cooperation, Korea shipping companies have conducted five NSR voyages since 2013, and DSME delivered 15 icebreaking LNG tankers for the Yamal LNG project.

Limiting Factors for Korea

Although Korea accomplished several meaningful contributions to Arctic affairs during the six years since obtaining its observer status in the Arctic Council, there are still some important challenges to be addressed in the future. These may become limiting factors in considering Korea's ongoing interest in engaging in Arctic affairs through the AC.

Generally speaking, the roles of observer states in the AC are gradually expanding. However, it can be said that the capacity of observer states has not been fully utilized, especially compared to their capacity with regard to Arctic issues. For example, many observer states also invest national budgets to support Arctic science research and sustainable Arctic businesses, including shipping and technological innovation. If the AC and its subsidiary bodies can provide continuing opportunities for this collaboration to address issues in the Arctic, these joint efforts can provide meaningful solutions to the many challenges facing the international community with regard to Arctic affairs.

Korea has accomplished outstanding economic development since the 1970s. But simply speaking, Korea's economy is heavily dependent on foreign trade and resources. Trade accounts for 87 percent of GNI, and

shipping accounts for 99.7 percent of trade volume. Korea imported 96.5 percent of its oil and gas resources, and the distance to import energy resources is almost 10,000 km. With these facts in mind, securing energy resources and its shipping routes is essential to the Korean economy. Therefore, so is the Arctic. Arctic economic issues are major news in the media, as was the case when Korea obtained observer status in the Arctic Council in 2013. Nevertheless, the slow progress toward more economic cooperation in the Arctic is reducing Korea's interest in the Arctic, even though natural gas reserves, the Northern Sea Route, and shipbuilding businesses are strongly connected to the Korean government's New Northern Policy.

In addition to the situation mentioned above, Korea has not been able to enact laws concerning domestic Arctic affairs. The Polar Cooperation Law (not official title) was submitted in 2016, but it is still in the review process in Congress. This law includes articles to support science research, economic cooperation, and capacity building for future cooperation.

In Korea, a strong legal foundation is crucial to ensure sustainable implementation of government policy. This is the reason why Korea successfully developed a comprehensive Arctic policy in 2013 through its Arctic Policy Master Plan, but it is still isolated from other national policies, such as the energy, climate and trade sectors.

At this moment, Korea does not have any university-level educational programs related to the Arctic, except for limited polar science being implemented though the Korea Arctic Academy and other training programs. This makes it difficult to accumulate comprehensive knowledge and drive academic progress regarding the Arctic.

Expected Future Roles

As an observer on the Arctic Council, Korea has actively participated in various activities of the Council for the last six years, including meetings and projects of the SAO and subsidiary bodies. Korea has striven to identify possible ways in which it may be able to play a valuable role in contributing to the work of the Council. Korea has also made efforts to establish a solid foundation of bilateral cooperation with all Arctic States and Permanent Participants, particularly in the realm of scientific and environmental research and exchange programs. Korea will continue to

further its efforts for the support and contribution to the Council and for the conservation and sustainable development of the Arctic.

In December 2018, the Ministry of Oceans and Fisheries, which is responsible for polar science, marine environment, fisheries, and shipping in the Korean government, announced a "2050 Polar Vision; A Responsible State of Contributing to the Polar Region." The goals of this Vision are: i) enhancing polar research for predicting and responding to climate change; ii) encouraging polar (Arctic) economic cooperation by utilizing the potential of the polar regions; and iii) positioning reliable partnerships for polar cooperation.

To accomplish those goals, seven principles are suggested:

- Propelling polar policy by responding preemptively to climate change
- Endeavoring to utilize the full potential of the polar region
- Galvanizing future industries in the polar region as a new engine for growth
- Fulfilling polar research and putting the results to practical use
- Joining positively in international cooperation for polar environmental protection
- Advancing into the Arctic with an expansion of intellectual, scientific, and diplomatic exchanges
- Securing research infrastructure and enhancing domestic capacity building

Based on those goals and principles, Korea can contribute to and facilitate Arctic cooperation in the following areas:

- Providing more environmentally friendly measures in the Arctic through R&D in science and technology, including 4th Industrial Revolution technology
- Contributing to address the Arctic Council's challenges, including climate change and marine environment protection by helping to supply infrastructure, including scientific research bases and vessels
- Developing innovative business models to add value to Arctic resources throughout the Asian region through Korea's domestic and international networks.

A Russian Perspective

Andrei Zagorski

Russia is among the countries that benefit from international cooperation in the Arctic, including with non-Arctic states. At the same time, Russia seeks to cooperate in a way that will allow it to protect its sovereignty and sovereign rights in the Arctic from any kind of "internationalization" —either through developing a comprehensive universal treaty governing the region (the option that has been raised particularly by international environmental NGOs but did not find support among Arctic states and beyond)[1]—or through allowing decision making on regional issues to migrate from regional frameworks (primarily the Arctic Council) to universal international organizations, such as the International Maritime Organization (IMO) or other potential ad hoc arrangements.

The sensitive issue is thus not the participation of non-Arctic states per se, but rather the way and the extent to which they are involved in governance of the region. This is one reason why Moscow was supportive of the fairly restrictive rules of procedure adopted by the Arctic Council in 2013 that minimized the possibilities of observer states to influence the Council's decisions, a prerogative which remains reserved for members only.[2] As a result, the consolidation of the Arctic Council into an exclusive club has generated disappointment and dissatisfaction among various observers.[3]

Moscow, as with other states in the region, is aware that the jurisdiction of coastal states does not extend to the entire Arctic Ocean. According to the Law of the Sea, in the Arctic Ocean's central part comprised of high seas, non-regional states have particular rights and responsibilities. This limits the possibility for coastal states to extend the competencies of regional forums, such as the Arctic Council, throughout the Arctic Ocean —since in that case they would infringe on third countries' rights. If non-Arctic states are not parties to decision making regarding issues that go beyond the national jurisdictions of Arctic Council member states, these non-Arctic states would not be bound by such decisions and, furthermore, could seek to assert their rights unilaterally or through broader institutions —a situation that Russia seeks to avoid.

Moscow thus faces a dilemma. Should it remain committed to

strengthening Arctic exceptionalism built on and around the Arctic Council, it could well be confronted with growing internationalization of the discussion of some issues on the regional agenda within global organizations (the IMO in particular) unless it offers observer states reasonable ownership of the regional process. In order to solve the dilemma, Russia should identify a proper balance between strengthening the Arctic Council by more actively engaging observer states while, at the same time, working together with observers in global organizations.

Finding the balance between the two tracks of addressing relevant issues of sustainable management of economic activities in the Arctic Ocean is still a work in progress. However, the general approach to defining this balance was formulated in 2008 by the five coastal states in the Ilulissat Declaration. They emphasized that the "unique position" of the coastal states to address Arctic issues is defined by the extent of "their sovereignty, sovereign rights, and jurisdiction in *large areas* of the Arctic Ocean" (emphasis added). "Large areas," but not the entire Ocean. At the same time, the agreement stressed that the existing "extensive international legal framework" based on the 1982 UN Convention on the Law of the Sea (UNCLOS) "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" (emphasis added).[4]

Ten years later, the Russian Foreign Minister Sergey Lavrov reconfirmed this approach by emphasizing that, "international law provides reliable guarantees for securing the interests of both coastal *and other States*," while at the same time stressing that "the coastal States have a special role in and responsibility for the future of the region" (emphasis added).[5] The particularities of this balance, however, have yet to be sorted out.

What Are the Main Roles Non-Arctic States Can Play in the Future of the Arctic?

Advancing and improving cooperation between Arctic and non-Arctic states regarding Arctic issues may be pursued in different ways. It may require:

- More active engagement of observer states within the Arctic Council
- Engagement of relevant non-Arctic states within a wider "Arctic Council Framework"

- Closer cooperation between Arctic and non-Arctic states in relevant universal organizations, particularly within the IMO, on issues on the regional agenda.

The Arctic Council

The room for improving the engagement of non-Arctic states within the AC is defined by two parameters. On the one hand, membership in the Arctic Council is limited to countries that exercise sovereignty over at least some territories above the Arctic Circle.[6] This implies that it is not expected to grow with new members. Countries that enjoy observer status don't have the option of upgrading their status and applying for membership. On the other hand, the existing rules of procedure of the Arctic Council introduced in 2013 are straitjacketing observers. These rules limit observers' formal possibilities to engage in the process of consensus building and decision shaping to participation in working groups and other subsidiary bodies to which they have been invited to participate, and contributing to the implementation of projects agreed upon by the member states.

This means that better integration of observers can be achieved primarily by identifying appropriate ways to make their engagement more flexible, e.g. by liberalizing the rules of procedure to the extent that would be acceptable to all member states and satisfactory to the observers. The discussion of reasonable adjustments of the rules of procedure also has to take account of the fact that all observers reveal very different levels of engagement and performance based on their current status,[7] so that the rationale for granting them significantly expanded opportunities for participation is not obvious for all member states.

The existing rules of procedure give the Chair of the Arctic Council the discretion to identify forms of engaging observer states in working groups and in other venues by inviting them to make statements, present written statements, submit relevant documents and provide views on the issues under discussion.[8] After 2015, consecutive Chairs have tested different policies in order to allow observers to expand their input. For instance, Finland, which held the Chair in the Arctic Council from 2017-2019, built upon practices developed by previous Chairs, particularly during the U.S. chairmanship between 2015-2017. Finland organized a special session of the plenary meeting of Senior Arctic Officials (SAO) in October 2017 to give observers the opportunity to present their pollution prevention

work within the Arctic Council framework. At the next SAO meeting in March 2018, Finland arranged for the opportunity for observers to directly interact with AC working groups in order to discuss appropriate forms of collaboration on specific projects and initiatives.[9]

While the Chairs' efforts to make the participation of observers more flexible are welcome, they do not address the core of the problem because they avoid raising the issue of a general "liberalization" of the rules of procedure. The following measures in particular could be considered to expand the opportunities for observers' participation:

1. A particularly obsolete rule of procedure is one that allows the suspension of the status of an observer should any member state withdraw its consensus to invite any observer state to join the meetings, should an observer engage "in activities which are at odds with the Council's Declaration" or the rules of procedure.[10] Threatening to exclude observers based on such potentially subjective criteria is not conducive to their better integration or to developing a more inclusive framework.
2. The same applies to the requirement that observers regularly provide self-reports about their relevant activities and contributions to the work of the Arctic Council "should they wish to continue as an observer to the Council."[11] At least in some cases this requirement encourages observer states to artificially compile evidence of their interest in and contribution to the work of the Arctic Council simply for the sake of producing a convincing report. Both the reporting and the review systems could be established in a more partnership-like and inclusive manner as has been attempted, for instance, in recent years by organizing special observers' sessions of SAO plenary meetings.
3. The rule establishing that "the total financial contributions from all Observers to any given project may not exceed the financing from Arctic States" could also be made more flexible by making more significant funding from observer states a normal procedure rather than an exception to be approved by the SAOs.[12]

These are a few proposals for very moderate reforms of the engagement of observers in the Arctic Council's work by removing the most obsolete elements of the rules of procedure.

The Arctic Council framework

The current decade has witnessed a significant growth of a network of forums which formally are not part of the Arctic Council proper but are closely intertwined with it and, as such, constitute a wider circle of AC-related activities that can be conceptualized as the "Arctic Council framework" or, as Erik Molenaar puts it, the "Arctic Council System."[13]

Those include, in particular, the practice of conducting *senior level thematic meetings*, such as the meetings of the Arctic Environment ministers initiated by Sweden in Jukkasjärvi in 2013[14] and followed up by Finland in the fall of 2018.[15] In September 2016, the U.S. held a high-level Arctic Science Ministers meeting in Washington[16] followed up by a second Arctic Science Ministerial held in Berlin, Germany (one of the observer states) in October 2018.[17] In 2012 and 2013, two meetings of the Defense Chiefs of the eight AC member states were held but have been suspended since 2014.

The three *legally binding agreements*—on cooperation on Aeronautical and Maritime Search and Rescue (2011); on Marine Oil Pollution Preparedness and Response in the Arctic (2013), and on Enhancing International Arctic Scientific Cooperation (2017)—were negotiated under Arctic Council auspices (within relevant Task Forces) but formally are agreements among the eight member states and are not a formal part of the Arctic Council aquis.[18] A series of *Arctic bodies* have been established in recent years, which are not part of the Arctic Council structure but are often very closely linked to its work. These include the Arctic Economic Council, the Arctic Offshore Regulatory Forum, and the Arctic Coast Guard Forum.[19]

This wider "Arctic Council Framework" appears to be a set of much more flexible platforms for engaging observer states. Representatives of observer states attended all thematic Arctic ministerial meetings on environment and science, without applying the stringent rules of procedure. While all three legally binding instruments were negotiated and signed only by AC member states, the process of formulation of the most recent agreement on scientific cooperation included consultations with observer states[20] and the agreement itself anticipates different forms of "Cooperation with non-Parties,"[21] the potential of which has yet to be explored.

Engagement of observer states within the more flexible "Arctic Council Framework" is far from perfect today. However, some forms of the engagement are promising and are appreciated by non-Arctic states.[22] They

could and should be further advanced, in particular by:

1. *Institutionalizing regular thematic high level meetings that would fully involve observer states*; and
2. *Devising regional agreements that would be open for observer states*. For example, should the Arctic states opt to develop a regional Arctic Memorandum on Port States Control for the purpose of facilitating the proper implementation of the Polar Code provisions, which would bring together countries otherwise splintered between the Paris (North Atlantic) and Tokyo (North Pacific) Memorandums, it would require intensive collaboration between the Arctic and relevant non-Arctic states and would thus benefit greatly from including willing observer states in the arrangement.[23]

Universal organizations

As described above, further developing the rules to ensure Arctic sustainability cannot be restricted to the Arctic Council alone. These efforts will have to involve relevant global organizations that can adopt binding decisions and facilitate their enforcement. For some time to come, the IMO will be the most important such organization for managing various aspects of vessel traffic in the Arctic. For this reason it would make sense to consider institutionalizing regular consultations of Arctic states (establishing an "Arctic caucus) within the IMO in order to increase cohesion of their policies on issues on regional agenda subject to discussions within the Organization, considering inviting observer states to take part in those consultations on a regular, or at least on an ad hoc, basis.

Summing Up

The proposals offered above represent options for a moderate, or evolutionary, improvement of the engagement of non-Arctic states in the process of consensus building on issues relevant for the sustainable development of the region. In discussing these and other proposals, one should keep in mind that the political environment, in which the Arctic regional cooperation in embedded, is changing and is not likely to remain conducive for the pursuit of even modest adjustments, at least in the short term. Apart from the general reluctance of members of the Arctic

Council to consider any significant reform of the forum, most recently even the previously achieved level of cohesion has been challenged. This is manifested in particular in the failure of the most recent Ministerial meeting in Rovaniemi, Finland, for the first time in the Arctic Council history, to reach consensus on a declaration (and on the strategy for the future), and in the increasing rhetoric stipulating increasing competition in the region that involves both Arctic and non-Arctic states.

Against this background, pursuing more intensive engagement of observer states within the extended format of the "Arctic Council Framework" rather than within the Council itself appears the most promising avenue in the short term. Although following this path would not be easy either, it could be reasonably expected that the current and the forthcoming Chairmanships could significantly contribute to better integrate observers within that broader framework.

Notes

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A Perspective from an NPAC Fellow

Sebastian Knecht

The former Danish ambassador to South Korea was quoted as saying in 2013, "I don't really care if there are 30 observers—it's not going to dramatically change the workings of the Arctic Council. Networking is important, and presence is important" (Bennett 2014, 84). As much as his remark praises forms of non-institutional cooperation outside the Arctic Council, including but not limited to bi- and multilateral agreements, joint ventures, or cultural, educational and exchange programs, it also raises skepticism about what actors in the capacity of observer can achieve in the Arctic's most important regional forum.

Despite ongoing discussions about weaknesses and inefficiencies in the Council's institutional setup, working group coordination, and internal procedures, it remains a well-functioning organization serving the Arctic region and its peoples. When judged against the means it has available to achieve the ends it was designed for, the Arctic Council remains a highly successful, adaptable and effective institution for the region (Kankaanpää and Young 2012; Young 2016). Today, Arctic Council working groups (WGs), task forces (TFs) and expert groups (EGs) conduct and finalize more projects and assessment work than ever before, some of it highly influential in regional and global climate governance and multilateral negotiations for environmental protection and sustainable development. At the same time, it has also become clear that the direct participatory benefits to some Arctic Council stakeholders are far from obvious and in many cases reflect neither their expectations nor their aspirations. State and non-state actors participating as observers are in positions that are too weak to substantially alter Arctic Council processes or outcomes. They are more often targets of than contributors to the work of the Arctic Council. This constraint leaves little room for observers to advance their own agendas, interests and policies, and is intended by design.

However, there are advantages of observer status that pull more and more actors into the Council. The first is a legitimacy-boosting effect of admission to the "preeminent intergovernmental forum for the Arctic region." Admission as an Arctic Council observer is one if not the ultimate gateway to recognition as a *rightful* Arctic stakeholder, no matter how

strong "networking" and "presence" really are. Once these actors are in, the second benefit is to receive first-hand information not only about the state and development of the Arctic region, but also of Arctic states' future intentions for regional governance arrangements. Even if observers may not be able to wield any direct influence on these policies, they receive a fuller picture of the region that allows them to constantly assess, develop and alter their own strategies, preferences, and policies in response.

In exchange for these benefits, observers are asked to contribute to the work of the Arctic Council, primarily at the level of WGs, TFs and EGs. The admission and readmission of observers has become increasingly conditional on their performance in these subsidiary bodies, and the Arctic Council invests more and more resources in monitoring performance and reviewing state and non-state actors in their observer capacities. With the reform of the Council's rules of procedure (RoP) in 2013, observers are required to submit activity reports to the Council. The original 1998 regulations included a directory provision that was optional (as opposed to a mandatory provision) regarding the submission of such activity reports (Arctic Council 1998, paras. 4, Annex 2). The 2013 RoP reform established a continuous and close-meshed monitoring system made up of two complementary components for assessing observers: a self-reporting mechanism on the one hand, and internal reviews conducted by the Senior Arctic Officials (SAOs) on the other.[1]

Under the self-reporting process, observers are asked to submit an activity report with information on concrete contributions to the Arctic Council before the biennial Ministerial meeting if they want to retain observer status with the Council (Arctic Council 2013, paras. 4, Annex 2). Submission of activity reports is a necessary requirement for observers to signal their continued interest in the status to the Council. The reporting guidelines provided to all observers make it very clear that non-compliance with this condition will be interpreted by the Arctic states as "an indication that the Observer is no longer interested in maintaining status as an accredited Observer to the Arctic Council"[2] (Arctic Council 2019a, 2). Regular submission of a report, however, does not guarantee the observer will also stay on the Council. The complementary observer review process by SAOs evaluates the reports that observers submit in a four-year interval after first admission. In the two review rounds already completed in 2017 and 2019, the status of all observers was renewed.

Another monitoring mechanism the Arctic Council has installed

recently is the project-tracking tool AMAROK. This was developed under Canadian Chairmanship of the Council (2013-2015), and its first edition was presented to Arctic ministers at the Iqaluit meeting in April 2015. The Council introduced AMAROK as "a database of all ongoing Arctic Council projects […] to help Arctic Council members, as well as Observers and the general public, to better appreciate the breadth and diversity of the Arctic Council's work, as well as to track progress and coordinate cross-cutting efforts" (Arctic Council Secretariat 2018, 40). AMAROK should therefore be seen in combination with the establishment of an observer reporting-and-review process and the Council's broader efforts to achieve institutional adaptation, procedural streamlining, and increased efficiency and effectiveness in a changing regional and global context. Initially managed and updated by the Arctic Council Secretariat, AMAROK was in 2017 transferred to an online database that allows for direct entries by WGs, TFs and EGs. It is thus not an impartial and centralized monitoring system, but is fed—just as the observer reporting process—with information from decentralized self-reporting, in this case by the chairs of the subsidiary bodies. The kind of information they are asked to provide to track progress in the work of the Arctic Council has become more and more detailed and now also includes contributions by observers, thus implying that the Arctic Council indeed considers their contributions an asset to successful and timely project implementation.[3]

All these different monitoring devices tell us a great deal about observers' integration into Arctic Council work, especially when assessed in combination. Comparing AMAROK entries with observer self-reports reveals striking differences in the notified and perceived performance of observers. More precisely, observer states seem to systematically over-report their performance in Arctic Council subsidiary bodies to a non-trivial extent. Only about half of all direct project contributions reported by the 13 observer states in the recent observer reporting process have also been recognized by subsidiary body chairs in AMAROK. While all observer states misrepresented their contributions, the degree to which they have done so varies from twenty-five percent to two-thirds of all projects mentioned.

Over-reporting does not necessarily equal low performance, as even observer states with a high percentage of over-reported activity have contributed to several projects, and usually allocate additional in-kind and financial resources to the Arctic Council. It may not even be that this difference is necessarily a result of misrepresentation on the side

of observers or subsidiary bodies. A certain margin of error is intrinsic to the reporting process, since both instruments rely on imperfect monitoring and subjective assessments. The discrepancy between the two mechanisms may rather point to different standards, understandings and interpretations of what "performance" means in the context of Arctic Council work rather than an actual performance-recognition gap. In the observer reporting process, observers shall provide information on "contributions to the subsidiary *bodies through project participation and support*, as well as collaboration with Permanent Participants" (emphasis mine). "Participation" and "support" are rather broad terms to measure performance, in that mere attendance at Arctic Council meetings would count as a contribution. And what many observer states indeed do in their activity reports is to list instances of representation at certain Arctic Council meetings, irrespective of whether this has actually resulted in voice or influence. On the other hand, AMAROK asks subsidiary bodies to report instances where "Observers *contributed in a particularly meaningful way* to this initiative" (emphasis mine), which sets a much higher bar for performance closer to impact.

What this cursory review of the different monitoring mechanisms shows is the necessity to distinguish between different "worlds of commitment" that includes varying levels of access, participation, and integration of observers in the work of the Arctic Council and particularly its subsidiary bodies. The observer reports and the AMAROK project-tracking tool further indicate that observer states' contributions are not as varied as would be possible or as Arctic actors probably consider desirable. Although all observer states contribute to Council projects in one way or another, it is remarkable that there is limited diversity regarding where they contribute. Most non-Arctic states concentrate as observer coalitions in a few projects, including the *Adaptation Actions for a Changing Arctic* (AACA) project, the *Sustaining Arctic Observing Networks* (SAON) project, the *Actions for Arctic Biodiversity 2013-2021* implementation plan, the Arctic Migratory Birds Initiative (AMBI), the *Short-lived Climate Forcers (SLCFs) EG*, and the *Expert Group in Support of the Implementation of the Framework for Action on Black Carbon and Methane*.

But (when) does presence result in impact? We know very little about how observer states engage in epistemic communities that constitute the Council's subsidiary bodies, which roles they ought or intend to play, how these roles vary across WGs, TFs, EGs and projects, what strategies

observers use to seek access, voice, and impact in these networks, and whether or not they succeed in establishing social ties with Arctic states and Indigenous communities in the long run. Much of the debate about the inclusive model of the Arctic Council implicitly or explicitly rests on the normative assumption that observer states' involvement and contributions are welcomed, needed and valuable in furthering the goals of the Arctic Council (Stokke 2013; Lunde, Yang, and Stensdal 2015; Bennett 2014). Others argue that observer status is a weak institution that comes with unfavorable terms for status holders, decreases their policy space with regard to Arctic affairs and gives Arctic states much more room to influence observers than the other way around (Young 2012; Guo 2012; Bekkevold and Offerdal 2014; Graczyk et al. 2017). I do not intend to dispute any of these claims, but only hint at the fact that to date no study has empirically assessed the amount and quality of contributions that observers bring to the Arctic Council, nor the conditions under which they can have a positive and lasting impact on its work.

What we know so far is that access, participation, and contribution is an integrative process and the three categories are connected. However, the level of integration in the work of the Council is not necessarily correlated to the level of participation in its meetings. Many observers score high on presence, and yet do not make a difference to the agenda or output of the Arctic Council (Knecht 2017b). On the other hand, some observers can be singled-out as having a larger impact on the Council although they are not represented at all levels or in a wide variety of projects. Previous research has shown that observer states with a higher degree of domestic policy coordination through strategic planning, inter-departmental harmonization or institutionalized focal points for polar affairs—such as an "Arctic ambassador"—have a significantly higher participation record in Arctic Council meetings (Knecht 2017a). Beyond representation, stronger engagement at the subsidiary body level and in distinct projects is often hampered by access barriers to Arctic Council epistemic communities, which are largely organized in "shadow networks" decoupled from the wider Arctic Council infrastructure (Knecht Forthcoming). Several case studies have tried to shed light on the mechanisms behind these more general patterns, with mostly Asian observer states being in the spotlight. Drawing on the Chinese example, some scholars suggest observer delegations are bigger and more diverse in the years following admission in order to get to know how the Council operates, only to see a decline in

presence later when observers are asked to contribute to specific projects (Koivurova et al. 2017, 169-78). There is little evidence supporting the idea that China—or any other observer state for that matter—would engage in forms of hard power diplomacy to further its own agendas, interests and governance solutions in the Council. Most analyses point to Chinese science diplomacy as a soft-power strategy for trust-building (Su and Mayer 2018; also Bertelsen, Li, and Gregersen 2017) or as a form of norm entrepreneurship to promote ideas of Arctic governance as an international responsibility that China would be ready and particularly well-suited to assume in partnership with Arctic states (Lanteigne 2017).

With the RoP reform of 2013, observer status has been restructured from a flexible and rather informal institution deeply rooted in the Council's WGs to a rules-based and formalized mechanism. Today, political criteria play a much greater role in the admission and review of observers than their capacity and ability to contribute to the scientific work conducted under the auspices of the Arctic Council. Any proposal to reorganize the future relationship among Arctic Council member states, PPs, and observers will have to strike a balance between the desire of Arctic states to keep observers at a fair distance and non-Arctic states' wishes to be involved as closely as possible. To achieve such reconciliation of interests, Oran Young has already suggested in 2012 to create an "informal mechanism that will not seem threatening to the members of the A8 but that will seem appealing to key non-Arctic states as a means of gaining a serious hearing for their views about matters of Arctic Ocean governance" (Young 2012, 293). Such a mechanism became a regular part of Arctic Council deliberations since the SAO meeting in Anchorage in October 2015. At "observer special sessions," Arctic states engage with observers in a "general discussion on the role of observers in the Arctic Council, with particular emphasis on how Observers can contribute to the Working Groups (WGs), Task Forces (TFs), and Expert Groups (EGs)" (ACSAO 2015). Observer special sessions take place back-to-back with SAO meetings, and thus are paradoxically both an instrument of deeper integration into Arctic Council governance as well as an instrument of exclusion from it. Participants consider the observer special sessions a valuable instrument for stakeholder interaction between Arctic and non-Arctic actors, though the benefit for deepened observer integration in Arctic Council projects is not entirely clear yet. The latest proposal to promote observer contributions has been to have "speed-dating" events at which WG representatives and observers can discuss concrete ways and opportunities

for collaboration in specific projects and initiatives (Arctic Council 2019b, 8). With proposals for institutional and procedural reform only increasing in number, the ultimate question the Arctic Council is soon likely to face is whether a piecemeal approach can have visible and sustained effects on observer integration in Arctic Council projects or whether the observer system needs to be rethought and reorganized in its entirety.

Notes

1. SAOs review the reports provided by observers and formulate recommendations for readmission based on this information. The final decision rests with Arctic ministers at Ministerial meetings.
2. In 2018, only 19 out of 21 observers that were supposed to report for the review process also submitted a report, while two non-governmental organizations failed to do so. The *National Geographic Society* (NGS) withdrew from observer status within a year after admission in May 2017 and before the deadline for the activity reports on December 1, 2018. Another non-state observer, the *Advisory Committee on Protection of the Sea* (ACOPS), has for unknown reasons missed the deadline. Apparently, this had no consequences for its observer status. Although not formally an accredited observer, also the European Union (EU) has to regularly report on its activities and contributions to the work of the Council.
3. Similarly, also contributions by Indigenous communities represented by Permanent Participants (PPs) have only become a criterion to be monitored and tracked in AMAROK at a later stage. Having been a controversial issue, the SAOs agreed at an executive meeting in Washington, D.C. in June 2015 to add elements to the AMAROK checklist that reflect and cover PP involvement in project planning and implementation (Arctic Council 2015).

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A View from Japan: A Perspective from an NPAC Fellow

Hajime Kimura

Although Japan has been involved in many activities in the Arctic, the Japanese government did not develop an official Arctic policy until recently. As the impact of climate change on the Arctic became increasingly apparent, the Japanese government began to define its role and interests in the Arctic.

In April 2013, the Japanese Cabinet adopted the *Basic Plan on Ocean Policy*. With its passage, problems relating to the Arctic were given official government importance. The plan set down three focus areas: observation of and research on the Arctic from a global perspective; international cooperation on the Arctic; and examination of the feasibility of Arctic sea routes. After Japan gained observer status at the Arctic Council (AC) in May 2013, a "Liaison Conference of Relevant Ministries and Agencies for Arctic Issues" was established to draft Japan's Arctic Policy. The conference consists of the Cabinet Secretariat, Cabinet Office, Ministry of Internal Affairs and Communications, Ministry of Foreign Affairs, Ministry of Education, Culture, Sports, Science and Technology, Ministry of Agriculture, Forestry and Fisheries, Ministry of Economy, Trade and Industry, Ministry of Land, Infrastructure, Transport and Tourism, Ministry of the Environment, and Ministry of Defense. After a total of 10 meetings, "Japan's Arctic Policy" was approved by the conference in October 2015.[1] In May 2018, the *Third Basic Plan on Ocean Policy* was approved by the Meeting of the Headquarters for Ocean Policy, followed by a Cabinet decision. In this Third Basic Plan on Ocean Policy, the policy for the Arctic was, for the first time, announced as one of its main measures.

Japan maintains a consistent strategy for the Arctic. In October 2018, Taro Kono, Japan's Minister for Foreign Affairs, attended an international conference held in Iceland and said that the challenges in the Arctic are common concerns shared by the international community, regardless of whether or not they are Arctic states.[2] He pointed out three elements of an "ideal Arctic" for all stakeholders. The first element is an understanding of the mechanisms driving environmental changes in the Arctic. As Japan's Arctic Policy puts it, "for more than half a century, since the 1950s, Japan

has carried out observations of and research on the Arctic. In 1991, more than 20 years ago, Japan became the first non-Arctic state to establish an observation station in the Arctic. It was the first non-Arctic state to join the International Arctic Science Committee (IASC), which was established in 1990. Observation data and scientific knowledge from Japan have made major contributions to understanding the environmental changes in the Arctic."

The second element, Foreign Minister Kono indicated, is the sustainable economic use of Arctic Sea Routes. Japan focuses on potential opportunities for this route and will encourage more Japanese companies to pay attention to Arctic business opportunities. Japan also considers the increasing risk of shipping accidents that may lead to Arctic pollution to be a serious concern. Japan can contribute to develop effective new technologies for the safety of navigation in the Arctic Ocean using its expertise in science and technology. Foreign Minister Kono indicated that the National Institute of Polar Research (NIPR) of Japan has been developing the "VEssel Navigation Unit support System," or VENUS. The system provides an overview of destination-specific information on sea ice and weather conditions almost in real time, covering a thousand kilometers from any ship that may have access to this VENUS system. With regard to this point, Japan has sent its experts to a meeting of one of the AC's working groups—Protection of the Arctic Marine Environment (PAME)—to contribute to its reports.

On the third element, Foreign Minister Kono stressed that free and open maritime order based on the rule of law is indispensable. Japan's Arctic Policy observes that "[u]p to the present, Arctic states have dealt with issues of territorial rights and maritime delimitation peacefully on the basis of international law. It is important to ensure that such actions continue to be based on the rule of law. The Arctic Ocean and other oceans are subject to international laws, including the United Nations Convention on the Law of the Sea (UNCLOS). Freedom of navigation and other principles of international law must be respected. Especially in the "ice covered areas" of the Arctic Ocean, it is necessary to cooperate with coastal states to ensure appropriate balance between the freedom and safety of navigation, and the protection and preservation of the marine environment under the principle of international law."

What are the similarities and differences between Japan's participation in the Arctic Council and in other Arctic venues? Japan's Arctic Policy states that "[t]here is a need for Japan to be involved appropriately in

formulating international agreements and rules regarding the Arctic. From this perspective, it is important for Japan to put its scientific knowledge and advanced technology to use in order to make further contributions to the activities of the AC. It is also important for Japan to participate actively in international forums other than the AC, and to initiate constructive discussions based on its scientific knowledge when necessary." This statement suggests Japan's practical participation in or contributions to the AC can certainly include participation in scientific research. In addition, the eight Arctic states signed the "Agreement on Enhancing International Arctic Scientific Cooperation" at the tenth Ministerial Meeting of the AC in Fairbanks, Alaska in May 2017. The Agreement provides that "Parties [(the Arctic states)] may in their discretion undertake with non-Parties [(the non-Arctic states)] cooperation described in this Agreement and apply measures consistent with those described in this Agreement in cooperation with non-Parties" (Article 17). It establishes the legal framework for scientific research conducted by non-Arctic states in the Arctic. Japan will be able to participate in the AC more effectively by utilizing this Agreement.

	Japan's participation / Contributions		
	AC		**Other Arctic venues**
Scientific research	Practical	Legal	Direct
Arctic sea route	Practical / Restricted		
Rule of law	No		

Is the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) able to make unique contributions to addressing the Arctic challenges arising today? JAMSTEC has continuously carried out observations on the ocean, sea ice, and weather in the Arctic using the research vessel RV *Mirai* in order to provide a more accurate understanding of environmental changes. Although RV *Mirai* has no ice-breaking capabilities, the vessel provides excellent navigational performance and resistance to ice. The vessel has conducted Arctic research cruises for two Japanese projects: GRENE (Green Network of Excellence) and ArCS (Arctic Challenge for Sustainability). During the period of the GRENE and ArCS projects, JAMSTEC mainly focused on the northern Bering and Chukchi Seas, because there are several biological hotspots that are associated with environmental and also potentially economic and social issues. The research findings obtained by RV *Mirai* could contribute to the integrated ecosystem

assessment (IEA) in the Pacific gateway of the Central Arctic Ocean. To develop the IEA of the Central Arctic Ocean, JAMSTEC will extend its research area to the deep Canada Basin, including the marginal ice zone where the ocean environment and ecosystem are not well studied.

Furthermore, recognizing the necessity to bridge the gap between natural sciences and social sciences to enhance the use of scientific knowledge as a basis for decision-making, JAMSTEC strongly encourages interdisciplinary study between natural sciences and social sciences and substantive collaborative research between natural scientists and social scientists in the context of the Arctic.

The views and opinions expressed in this paper are those of the presenter and do not necessarily reflect the official policy of Japanese government or JAMSTEC.

Notes

1. Japan's Arctic Policy, 16 October 2015. https://www8.cao.go.jp/ocean/english/arctic/pdf/japans_ap_e.pdf
2. Speech by H. E. Mr. Taro Kono, Minister for Foreign Affairs of Japan at the Arctic Circle 2018 Opening Session, 19 October 2018, Reykjavik, Iceland. https://www.mofa.go.jp/files/000410409.pdf

The Korea Maritime Institute (KMI) is a government-affiliated research organization under the umbrella of the National Research Council for Economics, Humanities and Social Science (NRC) in the Republic of Korea. Since its establishment in 1984, the KMI has been a major think tank in the development of national maritime and fisheries policies including shipping and logistics, port development, coastal and ocean management, maritime safety and security, and fisheries affairs.

The East-West Center (EWC) promotes better relations and understanding among the people and nations of the United States, Asia, and the Pacific through cooperative study, research, and dialogue. Established by the U.S. Congress in 1960, the Center serves as a resource for information and analysis on critical issues of common concern, bringing people together to exchange views, build expertise, and develop policy options.

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