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Lilly Weidemann

International Governance of the Arctic Marine Environment

With Particular Emphasis on High Seas Fisheries

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To my family

Preface

This research was completed during my time as scholar of the *International Max Planck Research School for Maritime Affairs* (*IMPRS*) in Hamburg.

It was conducted under the supervision of *Professor Dr. Hans-Joachim Koch*. I am very grateful for his support and advice during the research. I would also like to express my thanks to *Professor Dr. Dr. h.c. Jürgen Basedow*, *LL.M.* (*Harvard*) for co-reviewing this study and to *Jocasta Godlieb* for proofreading the manuscript.

Furthermore, I would like to thank the *IMPRS* and its directors for granting me the scholarship and providing me with the best conditions for the research project.

Last but not least, I am very grateful for the continuous support and encouragement of my friends and my family.

Contents

Chapter 1
Introduction

I Climate Change and the Arctic

The Arctic as a polar region is particularly intensely affected by climate change: During the last decades, surface air temperatures in this area have risen twice as fast as the mean global rate, with dramatic consequences for the Arctic environment.[1] A recent scientific assessment held in its key finding *inter alia* that "[a]nimal species diversity, ranges, and distribution will change" and that "[r]educed sea ice is very likely to increase marine transport and access to resources".[2]

The melting sea ice in the Arctic Ocean is probably the most prominent—albeit by no means the only—consequence of global climate change for the region. Current scientific estimations predict an ice-free central Arctic Ocean by 2030.[3] The decrease and thinning of the ice cover enables a multitude of ocean uses to be initiated and extended. In addition to maritime navigation for the purpose of transport of people and cargo, including for tourism and military purposes, these uses comprise exploration and exploitation of living and non-living resources (e.g. fish or oil and gas), construction of artificial installations, laying of pipelines and cables, overflight and marine scientific research (including bio-prospecting).[4]

Unlike the Arctic's southern counterpart, the Antarctic, there is currently no single comprehensive legal regime for governance of the Arctic. Instead, the region

[1] Timo Koivurova, Erik J. Molenaar and David L. VanderZwaag, "Canada, the EU, and Arctic Ocean Governance: A Tangled and Shifting Seascape and Future Directions," *Journal of Transnational Law & Policy* 18 (2008–2009) 247–288, at 248.

[2] Susan J. Hassol, *Impacts of a warming Arctic*: *Arctic Climate Impact Assessment* (Cambridge, New York: Cambridge University Press, 2004), p.10-11, available at: http://amap.no/workdocs/index.cfm?dirsub=%2FACIA%2Foverview/http://amap.no/acia//http://www.acia.uaf.edu/, last visited 17 December 2011.

[3] Estimation by Mark Serreze, NSIDC, see John Vidal, Arctic may be ice-free within 30 years, The Guardian, 11 July 2011, available at: http://www.guardian.co.uk/environment/2011/jul/11/arctic-ice-free, last visited 26 March 2012.

[4] Koivurova, Molenaar and VanderZwaag, *supra* note 1, at 249.

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is regulated by a patchwork of applicable international treaties, above all the United Nations Convention on the Law of the Sea (UNCLOS),[5] various regional and sub-regional agreements, national laws and soft law agreements.

II Aims of this Treatise

This treatise aims to provide an evaluation of the governance regime that regulates the use of the Arctic marine environment and its readiness to protect the fragile ecosystems in light of the consequences of climate change. It will present the institutional and legal frameworks, including soft-law arrangements, at the global and the regional level and the existing deficits regarding marine environmental protection.

As under a burning glass, the many challenges international environmental law is facing are becoming virulent in the Arctic at the same time[6]: Legal and institutional fragmentation with respect to the international regime for conservation and management of the marine environment, especially in areas beyond national jurisdiction (ABNJ), the need for marine spatial planning (MSP) and for the creation of marine protected areas (MPAs) and many more issues are coming to the fore as various marine activities commence or intensify.

From an international law perspective, the Arctic serves as an excellent example to illustrate the issues international environmental law has to address. The region might be regarded as a test case that shows how well the legal regime is equipped to address these challenges. In the Arctic marine environment, however, conservation and management efforts also have to take into account the pre-pollution resulting from the region's character as global 'pollution sink' and the considerable impacts of climate change.

In the past few years, particularly since the record-breaking retreat of summer sea ice in 2007, the previously widely neglected Arctic has become the centre of attention among policy-makers, legal scholars, the media and the general public. Disputes about delimitation and the extension of the outer continental shelves along with the former character of the Arctic as a cold-war arena raised a lot of attention.

Caused in part by the threat of extinction of the polar bear as the "iconic species of climate change",[7] the focus shifted to environmental concerns. NGOs, legal scholars and policy-makers initiated discussions on the environmental protection of

[5] United Nations Convention on the Law of the Sea, signed 10 December, entered into force 16 November 1994, 1833 UNTS 3.

[6] Jane Lubchenco observed correctly that "[t]h[e] Arctic Ocean is, in fact, a microcosm of all ocean ecosystems: rich in its beauty, bounty, and history but fragile in its susceptibility to unsustainable practices on land and in the oceans. Climate change is but one of many threats.", *id*., Lessons from the Ice Bear, in: Karen McLeod and Heather Leslie, *Ecosystem-based Management for the Oceans*, Island Press, Washington 2009, pp. xi-xiv, at xii.

[7] *Ibid*., at xiv.

the Arctic Region, especially with a view to the risks resulting from resource exploitation. Discussions also imply the need for a legally binding environmental Arctic Treaty. This treatise discusses and evaluates the various proposals that have been put forward to enhance environmental governance of the marine Arctic.

III Synopsis

The second chapter of this research deals with the consequences of climate change for the marine Arctic. Additionally, other relevant environmental concerns in the region, such as pollution, will be described to clarify the issues that have to be addressed by the Arctic environmental regime.

The third chapter begins with an analysis of the weaknesses of the existing regional 'soft law' regime with the Arctic Council at its core, and is followed by an assessment of gaps in the international legal regime governing the Arctic marine environment in the third part of the treatise. The observation of legal and institutional fragmentation and the sectoral approach to regulation as the main threats to a comprehensive and integrated ecosystem-based approach to environmental governance leads to the finding that these risks become particularly virulent in the areas beyond national jurisdiction (ABNJ). The gaps and weaknesses of the international legal regime for ABNJ are illustrated by the example of high seas fisheries, considering that fish are amongst the most vulnerable of all groups of living things,[8] with almost one-third of all known fish species threatened with extinction.[9] In the fourth chapter, possible solutions to enhance environmental governance of the marine Arctic are scrutinised. Finally, a possible way forward is outlined, including the question of participation in the future regime.

[8] See The Ocean Conservancy, HEALTH OF THE OCEANS, 2002 Report, at 17-18, available at http://www.oceanconservancy.org/site/DocServer/healthOceans.pdf?docID=221, last visited 5 September 2011.

[9] IUCN Red List of Threatened Species 2009 Update, see Extinction crisis continues apace, news release, 03 November 2009, available at: http://www.iucn.org/?4143/Extinction-crisis-continues-apace, last visited 26 March 2012.

Chapter 2
Environmental Situation in the Arctic

I Implications of Climate Change for the Arctic

The earth's climate is changing rapidly. The global temperature is rising "at a rate unprecedented in the experience of modern human society"[1] and scientific research reveals that global warming will even accelerate over the next 100 years, causing physical, ecological, social, and economic changes, many of which have already commenced.[2]

The Polar Regions are particularly affected by global change: Apart from the Antarctic peninsula, most pronounced warming on earth in the past decades has occurred in the Arctic Region[3] and projections suggest temperature increases to continue. This is a reason for concern because the Arctic is exceptionally vulnerable to observed and projected climate change and its ramifications.[4] The changes observed in the Arctic have already led to major impacts on the environment. If the current climate warming continues as expected, "these impacts are likely to increase, greatly affecting ecosystems, cultures, lifestyles, and economies across the Arctic".[5]

Climate change in the Arctic is also very relevant for other regions of the world, predominantly because the region could serve as an early warning system of climate change: The Polar Regions are the areas of the world where its consequences are shown first. Thus, they can provide a clue as to what the rest of the globe is facing in

[1] Susan J. Hassol, *Impacts of a warming Arctic*: *Arctic Climate Impact Assessment* (Cambridge, New York: Cambridge University Press, 2004), p. 8, available at: http://amap.no/workdocs/index.cfm?dirsub=%2FACIA%2Foverview/http://amap.no/acia//http://www.acia.uaf.edu/, last visited 17 December 2011.

[2] *Ibid*., p. 10.

[3] For the spatial definition of the Arctic Region see *infra* I.1.

[4] For more details see. *infra* I.2.

[5] Henry Huntington and Gunter Weller, in: Jim Berner *et al*., Arctic Climate Impact Assessment - Scientific Report, New York: Cambridge University Press, 2005, p. 4.

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the future. For this reason, the Arctic has often been called the "canary in the coal mine for climate warming",[6] with the retreating sea ice being considered a key climate change indicator.[7]

In addition, climate change in the Arctic is not an isolated occurrence. As a crucial element of the global climate system, the arctic climate influences and is at the same time itself influenced by global climate change[8]: it interacts with the climates of more southern latitudes through the atmosphere, oceans and rivers.[9] The currents move energy from the tropics, where the incoming sun energy is highest, to the poles, where sun energy is lowest.[10] Here the excess energy is transferred into space. If the climate keeps warming faster in the Arctic than at lower latitudes, the heat transferral will decelerate and weaken global atmospheric circulation,[11] thereby accelerating global warming.

These massive alterations have not only been noted by the Arctic states, but also by other interested stakeholders. Consequently, a vivid debate commenced on the necessity for a combined international effort to handle the effects of climate change on the Arctic marine environment.[12] Increasingly, it is recognised that the marine Arctic will be under growing pressure due to upcoming competing uses like shipping, drilling and fisheries which will be enabled or extended as a consequence of climate change.[13]

1 Spatial Definitions of the Arctic

Before the implications of global warming for the Arctic and the environmental problems existing in the region are described more closely, it is necessary to clarify which part of the earth is comprised by the term "Arctic". Broadly speaking, the Arctic is the region around the earth's north pole, comprising large water masses

[6] NASA climate scientist Jay Zwally, see Seth Borenstein, "Rate of ice melt shocks warming experts: 'The Arctic is screaming,' says one; another calls 2007 a 'watershed year'," *Associated Press*, November 12, 2007, http://www.msnbc.msn.com/id/22203980.

[7] Arctic Marine Shipping Assessment 2009 Report, Arctic Council, April 2009, available at: http://www.pame.is/images/stories/PDF_Files/AMSA_2009_Report_2nd_print.pdf, last visited 26 March 2012, p. 26.

[8] Huntington/Weller, *supra* note 5, p. 4.

[9] See McBean *et al*., in: *Arctic climate impact assessment* (*supra* note 5), p. 23.

[10] Hassol, *supra* note 1, pp. 34 and 36; for more details on the impacts of a warming Arctic climate on the global climate, see *infra* 2 a).

[11] See Mike Bettwy, "Changes in the Arctic: Consequences for the World", 24 January 2005 http://www.nasa.gov/centers/goddard/earthandsun/arctic_changes.html.

[12] Colette de Roo, "Environmental governance in the marine Arctic," *Yearbook of Human Rights & Environment* 9 (2009), 101–170, at 101.

[13] See e.g. *id*. *et al*., "Environmental Governance in the Marine Arctic: Background Paper," (Arctic Transform, 4 September 2008), p. 2.

surrounded by the territories of Canada, Denmark (for Greenland and the Faeroe Islands), Iceland, Finland, Norway, the Russian Federation, Sweden and the United States (with regard to Alaska).

The name Arctic derives from the Ancient Greek word *Artikós*, the country of the Great Bear. The Great Bear—*Ursa Major*—is a star formation that surrounds *Polaris*, the North Star, which is situated almost directly above the North Pole.[14]

There are many definitions of the Arctic, none of which is generally accepted[15]: According to a geographical definition of the Arctic, it consists of the area north of the Arctic Circle (66°32′N), which encloses the area of the midnight sun.[16] A purely geographic approach such as this, while convenient from the perspective of providing certainty, has a number of deficiencies. For example, Greenland—that shares the climatic and geographic features of other regions north of 66°32′N—does not fall within the Arctic Circle.[17] In addition, taking the Arctic Circle as the decisive parameter makes little sense from an environmental point of view, since "[v]egetation types follow climate more than solar radiation."[18]

A climatic boundary is often drawn at the 10°C July isotherm, which means that the Arctic is delimited as the area north of the region with an average July temperature of 10°C.[19] Another means of defining the Arctic is the tree line. The tree line is the zone where forest gives way to tundra with sporadic stands of trees and finally to treeless tundra.[20] Unfortunately, spatial definitions based on the 10° isotherm or the tree line are subject to significant variation making it difficult to precisely determine their limits—especially now when the region's climate and ecosystems are experiencing major changes.[21]

A marine boundary of the Arctic could be drawn where the water of the Arctic Ocean, cooled and diluted by melting ice, encounters warmer, saltier water from the southern oceans.[22] Finally, the Arctic is also defined by some as the zone of

[14] Hassol, *supra* note 1, p. 4.

[15] Huntington/Weller, *supra* note 5, p. 2.

[16] North of the Arctic Circle, the sun is above the horizon for 24 continuous hours at least once per year and below the horizon for 24 continuous hours at least once per year, see *Arctic pollution issues*: *A state of the Arctic environment report* (Oslo: AMAP, 1997), p. 6.

[17] Donald Rothwell, *The polar regions and the development of international law*, 1. publ., Cambridge studies in international and comparative law: New series; 3 (Cambridge: Cambridge University Press, 1996), p. 21.

[18] Arctic Pollution Issues, *supra* note 16, p. 6.

[19] *AMAP assessment report*: *Arctic pollution issues*, AMAP, Oslo 1998, p. 9.

[20] *Ibid*., p. 10.

[21] *Ibid*., p. 24.

[22] *Ibid*., p. 10; in the Canadian Arctic Archipelago, this belt is at approximately 63°N and swings north between Baffin Island and the coast of west Greenland. Off the east coast of Greenland, the marine boundary lies at approximately 65°N. In the European Arctic, the marine boundary is much farther north, pushed to about 80°N to the west of Svalbard by the warming effect of the North Atlantic Current. At the other entrance into the Arctic, warm Pacific water flows through the Bering Strait to meet Arctic Ocean water at about 72°N, forming a boundary that stretches from Wrangel Island in the west to Amundsen Gulf in the east, *ibid*.

continuous permafrost on land and sea-ice extent on the ocean.[23] As with the 10 °C boundary, the tree line boundary, the marine boundary and the zone of continuous permafrost as well as the sea-ice extent boundary are all subject to strong variations since they are influenced by regional weather patterns and implications of climate change. Thus, all these definitions have weaknesses of some kind.

Therefore, this paper will be based on the definition of the Arctic established by the Arctic Monitoring and Assessment Programme (AMAP), one of the Working Groups of the Arctic Council, the principal forum for "cooperation, coordination and interaction among the Arctic States".[24] Each of the eight Arctic countries[25] established the southern boundary in its own territory, and the international marine boundary was established unanimously.[26] According to the AMAP definition, the boundary should lie between 60°N and the Arctic Circle, with some modifications.[27]

It should be born in mind though, that even within the Arctic Council the various Working Groups have established different boundaries for the Arctic.[28] In addition, other international bodies adopted differing Arctic boundaries (e.g. the International Maritime Organisation (IMO) for the Arctic Shipping guidelines[29] or the United Nations Food and Agriculture Organization (FAO) for its Statistical Area No. 18 (Arctic Sea)[30]). With regard to the aim of this research to examine the

[23] Huntington/Weller, *supra* note 5, p. 2.

[24] See homepage of the Arctic Council, About us, http://www.arctic-council.org/index.php/en/about-us, last visited 30 March 2012; regarding structure and work of the Arctic Council see Chap. 3, III. 1.

[25] The number of countries that are considered as "Arctic States" naturally depends on the spatial definition of the region. Generally, the Arctic States have been referred to as the "Arctic Eight", including those states who have either land territory north of the Arctic Circle or that are coastal states bordering the Arctic Ocean, see Donald R. Rothwell, "The Arctic in International Affairs: Time for a New Regime?" *The Brown Journal of World Affairs* XV, no. 1 (2008): 241–253, at 241 and footnote 4. However, sometimes only the "Arctic Five", i.e. the coastal nations are regarded as Arctic States, see e.g. Brian van Pay, "National Maritime Claims in the Arctic," in *Changes in the Arctic environment and the law of the sea*, ed. Myron H. Nordquist, John N. Moore and Tomas H. Heidar, 61–77, Center for Oceans Law and Policy (Leiden: Martinus Nijhoff Publishers, 2010), at 65.

[26] Huntington/Weller, *supra* note 5, p. 2.

[27] "In the North Atlantic, the southern boundary follows 62 °N, and includes the Faroe Islands, as described in 'The Joint Assessment and Monitoring Programme' of the OSPAR Convention. To the west, the Labrador and Greenland Seas are included in the AMAP area. In the Bering Sea area, the southern boundary is the Aleutian chain. Hudson Bay and the White Sea are considered part of the Arctic.", Arctic pollution issues, *supra* note 16, p. 7.

[28] AMAP, CAFF, EPPR and AHDR developed differing boundaries to delimit the Arctic for their purposes, see the UArctic Atlas, available at: http://www.uarctic.org/AtlasMapLayer.aspx?m=642&amid=5955, last visited 26 March 2012.

[29] IMO, Guidelines for Ships Operating in Arctic Ice-Covered Waters, 23 December 2002, IMO doc. MSC/Circ.1056/MEPC/Circ.399, G-3.2.

[30] FAO. Major Fishing Areas, Arctic Sea (Major Fishing Area 18), CWP Data Collection, available at: http://www.fao.org/fishery/area/Area18/en, last visited 26 March 2012.

existing regime for governance of the Arctic marine environment, it makes sense to refer to the Arctic region as defined by the players who are the main actors in this respect. As the other existing definitions do not appear more convincing, the AMAP's definition seems the best choice.

2 Arctic Climate Trends

The observed and projected changes in Arctic climate and its consequences for the region as well as for the world were comprehensively evaluated for the first time in the Arctic Climate Impact Assessment (ACIA).[31] The ACIA was inaugurated by the Arctic Council in 2000 "to evaluate and synthesize knowledge on climate variability, climate change, and increased ultraviolet radiation and their consequences".[32] The Arctic Council tasked two of its working groups, the aforementioned AMAP and the Conservation of Arctic Flora and Fauna (CAFF) working group, to conduct the ACIA in cooperation with the International Arctic Science Committee (IASC).[33]

Its first and most prominent key finding was that the "Arctic climate is now warming rapidly and much larger changes are projected."[34]

a) Atmosphere

As mentioned before, climate change is experienced particularly severely in the Arctic. Surface temperatures in this area have risen at almost twice the average global rate in the last decades,[35] corresponding to an average annual temperature

[31] Hassol, *supra* note 1.

[32] ACIA Mission Statement, available at: www.acia.uaf.edu, last visited 26 March 2012.

[33] Three hundred scientists participated in the study over a span of three years. The assessment's findings and projections were released in the form of the 140-page synthesis report "Impacts of a Warming Arctic" in November 2004 (Hassol, *supra* note 1), and in the form of the scientific report later in 2005 (Berner et al., *supra* note 5).

[34] Hassol, *supra* note 1, p. 10, 22 *et seqq*.; the other nine key findings were: (2) Arctic warming and its consequences have worldwide implications; (3) Arctic vegetation zones are very likely to shift, causing wide-ranging impacts; (4) Animal species' diversity, ranges, and distribution will change; (5) Many coastal communities and facilities face increasing exposure to storms; (6) Reduced sea ice is very likely to increase marine transport and access to resources; (7) Thawing ground will disrupt transportation, buildings, and other infrastructure; (8) Indigenous communities are facing major economic and cultural impacts; (9) Elevated ultraviolet radiation levels will affect people, plants, and animals; and (10) Multiple influences interact to cause impacts to people and ecosystems, *ibid*., p.10 *et seq*.

[35] Lenny Bernstein, R. K. Pachauri and Andy Reisinger, *Climate change 2007*: *Synthesis report* (Geneva, Switzerland: IPCC, 2008), p. 30.

increase of about 2–3 °C since the 1950s (0.09 °C per decade in the past century[36]) and up to 4 °C in winter.[37]

Arctic summers of the twentieth century have been the warmest in the past 400 years,[38] with the year 2007 as the warmest on record.[39] In 2009, sea surface temperatures were slightly lower than the previous 2 years, but continued to be higher than normal.[40]

There are regional differences due to atmospheric winds and ocean currents, with some areas facing stronger warming and a few even experiencing a minor cooling,[41] but for the Arctic region as a whole there is a "clear warming trend".[42]

Over the next 100 years, mean annual temperatures are anticipated to rise 3–5 °C over land and up to 7 °C over the oceans. Winter temperatures are expected to increase even by 4–7 °C over land and 7–10 °C over the oceans.[43]

The reasons why the Arctic warms faster than the rest of the world are numerous and involve several feedback processes.[44] To understand the phenomenon known as the 'Arctic amplification'—greater temperature increase in the Arctic compared to the earth as a whole[45]—it is essential to comprehend the causes and form of global warming.

Over the last 100 years, global surface temperature has increased by about 0.76 °C (rise from 1850–1899 to 2001–2005). Of the 12 years between 1995 and 2006, 11 rank among the 12 warmest years in the record of global surface temperature (since 1850) and the linear warming trend over the last 50 years (0.13 °C per decade) is almost twice that of the last 100 years.[46]

There is a broad consensus among international scientists that most of the observed warming is attributable to human activities,[47] i.e. mainly to the rise in anthropogenic greenhouse gas concentrations.[48] These have increased since

[36] McBean *et al*., *supra* note 9, p. 54.

[37] Huntington/Weller, *supra* note 5, p. 3; Bernstein *et al*., *supra* note 35, p. 30.

[38] J. Overpeck et al., "Arctic Environmental Change of the Last Four Centuries," *Science* 278, no. 5341 (1997), 1251–1256, at 1252.

[39] J. Overland/J. Walsh/M. Wang, Arctic Report Card 2008, October 2008, p. 2, available at: http://www.arctic.noaa.gov/report08/ArcticReportCard_full_report.pdf, last visited 26 March 2012.

[40] National Snow and Ice Data Center (NSIDC) Press Release of 6 October 2009, available at: http://nsidc.org/news/press/20091005_minimumpr.html, last visited 26 March 2012.

[41] Overland *et al*., *supra* note 39, p. 4.

[42] Susan J. Hassol, Impacts of a warming Arctic, Arctic Climate Impact Assessment, Highlights, p. 4.

[43] *Id*., *supra* note 1, p. 28.

[44] J. Richter-Menge, *et al*. (2006) State of the Arctic Report, NOAA OAR Special Report, NOAA/OAR/PMEL, Seattle, WA, p. 6, available at: http://www.pmel.noaa.gov/pubs/PDF/rich2952/rich2952.pdf, last visited 26 March 2012.

[45] Rune G. Graversen et al., "Vertical structure of recent Arctic warming," *Nature* 451, no. 7174 (2008), 53–56, at 53.

[46] Bernstein *et al*., *supra* note 35, p. 30.

[47] Hassol, *supra* note 1, p. 2; Bernstein *et al*., *supra* note 35, p. 37.

[48] Bernstein *et al*., *supra* note 35, p. 39.

pre-industrial times, with a growth of 70 % from 1970 to 2004. The annual emission of carbon dioxide (CO_2), the principal anthropogenic greenhouse gas, has grown by about 80 % between 1970 and 2004.[49] The high concentration of greenhouse gases in the atmosphere causes what is known as the 'Greenhouse Effect': Most of the heat energy emitted from the earth's surface is absorbed by the gases which radiate heat back down, resulting in warming of the lower atmosphere and the surface. Therefore, augmenting the greenhouse gas concentrations increases the warming of the surface and decelerates the transmission of heat energy to space.[50]

In the Polar Regions, the troposphere[51] is more stably stratified than closer to the Equator. Therefore, the warming of the earth's surface is restricted to the lower troposphere in high altitudes, whereas in the tropics the warming is distributed vertically by deep convection.[52]

There is also an ocean-air interconnection contributing to the Arctic amplification: Due to the reduction in the sea ice, solar heat absorbed by the oceans during summer is more easily transferred to the atmosphere in winter and decelerates the growth of sea ice from fall to winter.[53]

Last but not least, the ice-albedo feedback plays an important role in Arctic warming: An increase in surface air temperature results in melting of snow and ice which leads to a reduction of the extent of this highly reflective cover. This entails a lower surface albedo,[54] which increases absorption of solar radiation, which leads to additional warming, which again triggers further reduction of the snow and ice cover, and so on.[55]

The albedo of the Arctic region is further reduced by the predicted expansion of forest northwards into areas, which are currently tundra. As tundra reflects much more radiation than forest, this development will further amplify the temperature increase. Additionally, the soot resulting from fossil fuel burning slightly darkens the surface of ice and snow, which also results in a lower reflective capacity.[56]

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[49] *Ibid*., p. 36.

[50] Hassol, *supra* note 1, p. 2.

[51] The troposphere is the lowest and densest part of the earth's atmosphere in which most weather changes occur and temperature generally decreases rapidly with altitude and which extends from the earth's surface to the bottom of the stratosphere, see Merriam Webster, online available at: http://www.merriam-webster.com, last visited 26 March 2012.

[52] Bernstein *et al*., *supra* note 35, at 53.

[53] C.T Tynan and D.P DeMaster, "Observations and Predictions of Arctic Climatic Change: Potential Effects on Marine Mammals," *Arctic and Alpine Research* 50, no. 4 (1997), 308–322, at 308.

[54] Sea ice covered with snow reflects about 85–90 % of sunlight, while ocean waters reflects just 10 %, Hassol, *supra* note 1, p. 34.

[55] Mark C. J. A. Serreze, "The Arctic amplification debate," *Climatic Change* 76, 3–4 (2006), 241–264, at 243.

[56] Hassol, *supra* note 1, p. 35.

These feedback processes create a reinforcing cycle that will likely result in an acceleration of climate change, meaning the Arctic will warm up more rapidly over the next 100 years.[57]

b) Ocean

The Arctic comprises deep, ice-covered, and almost isolated ocean enclosed by the land masses of North America and Eurasia, leaving aside the breaches at the Bering Strait and in the North Atlantic.[58] Approximately two-thirds of the Arctic as defined above consists of ocean, including the Arctic Ocean,[59] which covers about 14 million km^2,[60] and its shelf seas along with the Nordic, Labrador, and Bering Seas.[61]

Arctic marine ecosystems stand out due to their high proportion of shallow water and coastal shelves.[62] The total ocean area covers around 11.5 million km^2, of which 60 % is continental shelf.[63]

The "defining characteristic"[64] of the marine Arctic is sea ice, i.e. frozen seawater that floats on the ocean surface. Over at least the past 30 years, however, the annual average sea-ice extent[65] has decreased dramatically, by roughly 8 % or nearly 1 million km^2.[66]

In 2007, Arctic sea ice dropped to the lowest levels since the beginning of satellite measurements in 1979. In September 2007, the average sea ice extent was 4.28 million km^2, the lowest September on record, exceeding the previous record for the month, set in 2005, by 23 %. At the end of the melt season, sea ice in September 2007 was 39 % or over 1.6 million km^2 below the long-term average from 1979 to 2000. The September sea ice decline rate is now over 10 % per decade or 72,000 km^2 per year.[67]

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[57] See *ibid.*

[58] Huntington/Weller, *supra* note 5, p. 4.

[59] For the limits of the Arctic Ocean, see. International Hydrographic Organization, Limits of Oceans and Seas, Special Publication No. 23, 3rd edition 1953, p. 11 *et seq.*, available at: http://www.iho-ohi.net/iho_pubs/standard/S-23/S23_1953.pdf, last visited 26 March 2012.

[60] Huntington/Weller, *supra* note 5, p. 10; however, there are varying figures concerning the Arctic Ocean, see Davor Vidas, Protecting the polar marine environment: interplay of regulatory frameworks, in: *id.*, ed., *Protecting the polar marine environment*: *Law and policy for pollution prevention* (New York: Cambridge University Press, 2000), 3–16, at 4.

[61] Huntington/Weller, *supra* note 5, p. 12.

[62] *Ibid.*, p. 17.

[63] McBean, *et al.*, *supra* note 9, p. 26.

[64] *Ibid.*, p. 30.

[65] The sea-ice extent refers to the total number of 25 × 25 kilometre square sections of ocean covered by at least 15 % ice, Daniel Cressey, naturenews, 18 September 2007, available at: http://www.nature.com/news/2007/070917/full/news070917-3.html, last visited 26 March 2012.

[66] Corresponding to an area larger than all of Norway, Sweden, and Denmark combined, Hassol, *supra* note 1, p. 25.

[67] National Snow and Ice Data Center (NSIDC), Press Release from 1 October 2007, Arctic Sea Ice Shatters All Previous Record Lows, available at: http://nsidc.org/news/press/2007_seaiceminimum/20071001_pressrelease.html, last visited 26 March 2012.

Although autumn 2007s extreme decline in sea ice was due to several factors,[68] the long-term downward trend is undoubtedly related to warming temperatures in the Arctic and thus to the effects of greenhouse warming.[69] This finding has been recently confirmed by the 2011 Arctic sea ice minimum which, according to one assessment is the second lowest on record[70] and exceeded the minimum of 2007 according to another measurement.[71]

Besides the record-breaking retreat of sea ice, the lowest sea ice extent, or the absolute minimum, occurs later in the year. In 2007, the minimum was observed on September 16th, while from 1979 to 2000, the minimum usually appeared on September 12th. This shows that spring melt comes earlier and autumn freezing begins later due to the general warming of the Arctic.[72]

In addition, sea ice has also grown thinner in the past decades. Average sea ice thickness is estimated to have decreased by 10–15 % and particular areas even faced reductions of up to 40 % between the 1960s and late 1990s.[73] At the same time, older, thicker perennial sea ice decreased, with little ice older than 5 years remaining.[74]

By 2100, declines of about 10–50 % in annual average sea-ice extent are expected.[75] Some models project the Arctic will be completely sea-ice free in summer some time between 2050 and 2100.[76] According to other studies, the retreat of Arctic sea ice is likely to pick up the pace so rapidly that this might happen as early as 2040[77] or 2030.[78]

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[68] E.g. persistent high pressure over the central Arctic, resulting in a circulation pattern in which ice tended to drift out of the western Arctic and a younger and thinner ice cover to start with., NSIDC News, Issue No. 61, Fall 2007, p. 1, available at: http://nsidc.org/pubs/notes/61/Notes_61_web.pdf, last visited 26 March 2012.

[69] *Ibid*.

[70] NSIDC, Arctic Sea Ice News & Analysis, 15 September 2011, Arctic sea ice at minimum extent, available at: http://nsidc.org/asina/2011/091511.html, last visited 26 March 2012.

[71] Georg Heygster, University of Bremen, Press Release, New Historic Arctic Sea Ice Minimum 2011, 16 September 2011, available at: http://www.iup.uni-bremen.de:8084/amsr/minimum2011-en.pdf, p. 1, last visited 26 March 2012.

[72] NSIDC Press Release, *supra* note 67.

[73] Hassol, *supra* note 1, p. 25.

[74] J. Richter-Menge, *et al*., Arctic Report Card 2008, available at: http://www.arctic.noaa.gov/report08/ArcticReportCard_full_report.pdf, p. 10.

[75] Hassol, *supra* note 1, p. 30.

[76] Ola M. Johannessen et al., "Arctic climate change: observed and modelled temperature and sea-ice variability," *Tellus A* 56 (2004), 328–341, at 337; John E. Walsh and Michael S. Timlin, "Northern Hemisphere sea ice simulations by global climate models," *Polar Research* 22, no. 1 (2003), 75–82, at 81.

[77] Marika M. Holland, Cecilia M. Bitz and Bruno Tremblay, "Future abrupt reductions in the summer Arctic sea ice," *Geophysical Research Letters* 33 (2006), L23503.

[78] NSIDC Press Release, *supra* note 67.

In the record year of 2007, sea ice declined so much that the Northwest Passage—the most direct shipping route from the Pacific to the Atlantic via the Canadian Arctic Archipelago[79]—completely opened up for the first time in human memory.[80] The passage had been navigated several times in the past by icebreakers and ice-strengthened ships. However, by the end of the 2007 melt season the passage could have been sailed using a standard ocean-going vessel.[81]

Within the Arctic region, the decline in sea ice will have various consequences. Besides far-reaching changes for Arctic species and ecosystems,[82] these impacts include "increased air temperature, decreased salinity of the ocean's surface layer, and increased coastal erosion".[83]

3 Impacts on Natural Systems

a) Arctic Ecosystems

Arctic marine systems are unique due to various physical factors, such as a pronounced seasonality, a low level of sunlight, a very high proportion of continental shelves and shallow water and of course the presence of sea-ice. Ecosystems generally consist of specialised species that have been able to adapt to these extreme conditions, with very low species diversity.[84]

The adaptation of arctic species to the harsh climatic conditions limits their ability to respond to climatic warming and other environmental changes, for which reason they are particularly susceptible to changes in climate or biological invasion.[85] Therefore, arctic organisms are very likely to change their distributions rather than evolve significantly in response to warming.[86]

Biodiversity, distribution and productivity of marine biota will probably be strongly affected by the consequences of climate change, like changes in sea ice, warming and acidification.[87]

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[79] More on the Northwest Passage and the legal regime governing it *infra* Chap. 3, IV. 1. g).

[80] NSIDC Press Release, *supra* note 67.

[81] *Ibid.*

[82] On this issue, see. *infra* 3. a).

[83] Hassol, *supra* note 1, p. 25; Mark C. Serreze, Marika M. Holland and Julienne Stroeve, "Perspectives on the Arctic's Shrinking Sea-Ice Cover," *Science* 315, no. 5818 (2007), 1533–1536, at 1536.

[84] Loeng *et al.*, Arctic Climate Impact Assessment – Scientific Report, *supra* note 5, p. 454.

[85] Huntington/Weller, *supra* note 5, p. 12.

[86] Terry V. Callaghan *et al.*, Arctic Climate Impact Assessment – Scientific Report, *supra* note 5, p. 266.

[87] Martin Sommerkorn and Neil Hamilton, "Arctic Climate Impact Science - an update since ACIA", WWF International Arctic Programme, Oslo, April 2008, p. 60; the ACIA Report held that "[a]nimal species diversity, ranges, and distribution will change", see *Hassol*, *supra* note 1, p. 10.

b) Impacts of Diminishing Sea Ice

Organisms living in the sea ice or dependent on it will be particularly severely impacted by the retreating sea ice.[88] This affects first of all sympagic organisms, i.e. those living in close association with sea ice, such as bacteria and simple algae, but also vertebrate fauna.[89] Since these organisms are crucial for providing pelagic and benthic communities with food, the whole arctic marine community could be affected.[90]

Another—widely neglected, but possibly momentous—consequence of diminishing sea ice is likely to be the decrease of low trophic level organisms like diatoms and algae, whose growth is promoted by sea ice.[91] Since all food webs depend on these organisms, the effects could be grave.

The reduction of sea ice will very likely also have devastating effects on some marine mammals, like polar bears and ice-dependent seals.[92] Polar bears hunt on the ice and use ice corridors to move from one area to another. Female polar bears emerging from their dens with their cubs in spring will be particularly affected by the loss of sea ice. At that time, they have not eaten for 5–7 months. Thus, a successful seal hunt, which is dependent on good ice conditions, is crucial for their survival.[93] If sea ice diminishes almost completely during summer time, polar bears will probably not survive as a species.[94]

Ice-dependent seals such as the ringed seal, ribbon seal, and bearded seal are also highly vulnerable to sea ice reductions since they give birth and nurse their pups on the ice and use it as a resting platform.[95]

The ACIA called for improvement in capacity to monitor and understand changes in the Arctic and for enhancement in long-term Arctic biodiversity monitoring.[96] The Conservation of Arctic Flora & Fauna (CAFF) Working Group of the Arctic Council responded to these calls with the implementation of the Circumpolar Biodiversity Monitoring Program (CBMP).[97] In 2006, the Arctic Council endorsed

[88] Victor Smetacek and Stephen Nicol. "Polar ocean ecosystems in a changing world", *Nature* 437 (2005) no. 7075, 362–368, at 362.

[89] Loeng, *et al.*, *supra* note 84, p. 480.

[90] *Ibid.*

[91] Stephen A. Macko, "Changes in the Arctic Environment," in *Changes in the Arctic environment and the law of the sea*, *supra* note 25, 107–29, at 113.

[92] Hassol *supra* note 1, p. 10.

[93] *Ibid.*, p. 58.

[94] *Ibid.*

[95] *Ibid.*, p. 59.

[96] Hassol, *supra* note 1, p. 122.

[97] See CAFF homepage, Monitoring: The Circumpolar Biodiversity Monitoring Programme (CBMP), available at: http://caff.is/monitoring, last visited 30 March 2012.

the Arctic Biodiversity Assessment (ABA)[98] in order to accomplish the United Nations UNEP/CBD 2010 global target to halt or significantly reduce biodiversity loss and the Millennium Development Goal Nr. 4 to ensure environmental sustainability.

Its purpose is to "synthesize and assess the status and trends of biological diversity in the Arctic".[99] In 2010, the ABA launched its first product, the overview report "Arctic Biodiversity Trends 2010: Selected Indicators of Change",[100] which presents a preliminary assessment of status and trends in Arctic biodiversity. The report found that "[a]lthough the majority of Arctic species examined [...] are currently stable or increasing, some species of importance to Arctic people or species of global significance are declining."[101] However, that does not mean that all Arctic species are in a stable population state. Within its key findings the report holds that information is still lacking for numerous species and the relationship to their habitat. Even with regard to animals that have captured the human imagination, like the polar bear, "trends are known for only 12 of 19 subpopulations; eight of these are declining."[102]

c) UV Impacts

Ozone is a gas in the atmosphere playing a crucial role in blocking harmful ultraviolet (UV) radiation from reaching the Earth.[103] The highest concentration of ozone can be found in the stratosphere, between 10–17 and 50 km above the Earth's surface.[104] As part of an overall hemispheric trend, ozone concentrations have shown a broad decrease of about seven, during springtime even 10–15 % in the Arctic stratosphere since 1979.[105]

As snow and ice retreat due to warming, plants and animals on top of the ice will probably receive lower doses, since snow and ice reflect solar radiation upward.

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[98] *Ibid.*, About the ABA, available at: http://www.caff.is/index.php?option=com_content&view=article&id=576&Itemid=1073.

[99] Arctic Biodiversity Trends 2010 – Selected indicators of change, available at: http://www.arcticbiodiversity.is/index.php/en/about, last visited 30 March 2012.

[100] Arctic Biodiversity Trends 2010 – Selected indicators of change, CAFF International Secretariat, Akureyri, May 2010, available at: http://www.arcticbiodiversity.is/images/stories/report/pdf/Arctic_Biodiversity_Trends_Report_2010.pdf, last visited 26 March 2012.

[101] *Ibid.*, p. 13; species that are particularly declining are wild reindeer and caribou, see *ibid.*

[102] *Ibid.*

[103] Åke Bjørke/Lars Kullerud/Olav Hesjedal, BCS 100: The Circumpolar WorldModule 7: Environment, Climate Change, and Pollution, 3. Ozone Depletion, available at: http://www.grida.no/prog/polar/bsc/bsc7.htm, last visited 30 March 2012.

[104] NOAA, Stratospheric Ozone, Monitoring and research in NOAA, available at: http://www.ozonelayer.noaa.gov/science/basics.htm, last visited 30 March 2012.

[105] Hassol, *supra* note 1, p. 98.

Plants and animals below the snow and ice, to the contrary, will receive more UV radiation, since that cover no longer protects them.[106]

In the marine ecosystems, phytoplankton, i.e. the tiny plants that are primary producers of marine food chains, can be harmed by UV radiation exposure, e.g. leading to UV-induced deaths in early life stages and damage to the DNA. Additionally, some marine fish species are affected detrimentally by UV in their early life stages.[107]

4 Impacts on Human Activities

In addition to the threats resulting from climate change, the Arctic marine environment is affected by the human activities taking place in the region, which in turn are impacted by climate change. The Arctic lies "within the political boundaries of some of the world's richest and most powerful nations".[108] These carry out significant economic activities like fishing, oil extraction, mining, and shipping, which are environmentally sensitive. Furthermore, the Arctic has been a critical strategic area, and there are still considerable defence establishments in the region.[109]

Climate change and in particular retreating sea ice will significantly increase economic possibilities in the marine Arctic: The retreat of sea ice will probably open up new shipping routes and increase the use of existing ones, not only for the carriage of goods, but also for tourism activities like cruise shipping. Fishing is likely to extend to new areas outside the exclusive economic zones of the states bordering the Arctic Ocean, following the northward migration of many valuable arctic fish stocks such as herring and cod into the high seas. Melting sea ice also enables the exploitation of previously inaccessible resources, in particular oil and gas.

This section deals with what are potentially the most important human economic activities in the region (shipping, fishing and oil and gas exploitation) and the problems they pose for the Arctic marine environment, and the impacts of climate change on these activities.

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[106] *Ibid*., p. 99.

[107] Hassol, *supra* note 1, p. 105.

[108] IPCC, Special Reports, The Regional Impacts of Climate Change, ch. 3, 3.1.

[109] *Ibid*. In fact, "nowhere else on earth is there such a concentration of civilian and naval nuclear reactors", Olav S. Stokke, Geir Hønneland and Peter J. Schei, "Pollution and conservation," in *International cooperation and arctic governance*: *Regime effectiveness and northern region building*, ed. Olav Schram Stokke and Geir Hønneland, 78–111 (London: Routledge, 2007), at 81.

a) Shipping

Arctic navigation was formerly restricted to the supply of local communities during the summer season.[110] With the arrival of mineral and hydrocarbon exploitation, summer marine activities increased.[111] In 1920, regular commercial navigation during the limited summer period began and in the subsequent years, increase in ice breaker fleet power resulted in an extension of the navigation period.[112]

The significant reduction in sea-ice extent as a result of climate change has raised the prospect of opening long-sought navigational routes—the aforementioned Northwest Passage, the Northern Sea Route and even a trans-polar route across the central Arctic Ocean.

aa) The Northwest Passage and the Northern Sea Route

The Northwest Passage is the "sea route connecting the Atlantic and Pacific Oceans through the archipelago of Canada".[113] It consists of five basic routes, plus at least two variations of two of these routes.[114] Only two of them are presently suitable for navigation by deep draft ships: Both pass through Davis Strait, Baffin Bay and the Parry Channel. From there, one route goes through the Prince of Wales Strait and the other through the McClure Strait.[115]

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[110] Øystein Jensen, The IMO Guidelines for Ships Operating in Arctic Ice-covered Waters, Fridtjof Nansens Insitutt Report 2/2007, p. 1.

[111] Robert A. Lake, "The Physical Environment," in *The Challenge of Arctic shipping*: *Science*, *environmental assessment*, *and human values*, ed. David L. VanderZwaag and Cynthia Lamson, 20–58 (Montreal Buffalo: McGill-Queen's University Press, 1990), at 20.

[112] Nikolai Babich, Icebreakers and Ice Type Vessels Operation Experience at Northern Sea Route, Arctic Marine Transport Workshop, 28–30 September 2004, Appendix C, p. A-4.

[113] Jensen, *supra* note 110, p. 2.

[114] Donat Pharand, *The law of the sea of the Arctic*: *With special reference to Canada*, Collection des travaux (Ottawa: Univ. of Ottawa Press, 1973), p. 189 *et seqq*.

[115] *Ibid*.; the search for a navigable route around the northern edge of the Americas has been aptly termed the "Arctic Grail" (term coined by Pierre Berton, *The quest for the North West Passage and the North Pole*, *1818–1909*. New York: Lyons Press, 2000.); see Tavis Potts and Clive H. Schofield, "The Arctic," *International Journal of Marine and Coastal Law* 23, no. 1 (2008), 151–176, at 156; Michael Byers and Suzanne Lalonde, Who controls the Northwest Passage? *Vanderbilt Journal of Transnational Law* 42, no. 4 (2009): 1133–1210, at 1135. The quest for a marine shortcut to the Orient for European trade goes back to 1497 when the Italian navigator *John Cabot* was sent by *King Henry VII* of England to find a northerly route to the Orient. Like many of his successors – among them Sir *Francis Drake*, Sir *Martin Frobisher*, Captain *James Cook* and many more – *Cabot* failed in accomplishing his mission. The first successful transit of the Northwest Passage by sea was not realized until almost 400 years later, when the Norwegian explorer *Roald Amundsen* completed the trip in a converted herring boat, the *Gjoa*, over a three-year span from 1903 to 1906 (Cynthia Lamson and David L. VanderZwaag, eds., *Transit management in the Northwest Passage*: *Problems and prospects*, Studies in polar research (Cambridge: Cambridge University Press, 1988), p. 3).

In 1968, the discovery of large oil reserves at Prudhoe Bay resulted in oil companies beginning to consider the possibility of using the Northwest Passage for oil transportation.[116] In 1969 and 1970, the *S.S. Manhattan* run by the *Humble Oil and Refining Company* was the first oil tanker to navigate the Northwest Passage and thereby showed that it might possibly be an economic method of transporting oil from the newly-discovered Alaskan North Slope to the large East Coast market.[117]

The Northern Sea Route, previously referred to as the Northeast Passage,[118] stretches approximately 2,800 km along the Russian Arctic coast from Novaya Zemlya to the Bering Strait.[119] In contrast to most sea routes, "there is no single, set channel for the ships to follow. Ice conditions at any one place decide the sailing course to be set."[120] The route can pass through a succession of individual seas—the Barents, the Kara, the Laptev, the East Siberian and the Chuckchi, which are linked by about 58 straits leading through three archipelagos—the Novaya Zemlya, the Severnaya Zemlya and the East Siberian Islands.[121]

Since the oil and gas industry are "the backbone of the Russian economy",[122] and the development of the North is dependent on the exploitation of new oil fields, the Northern Sea Route is of extreme importance for Russia. Along with its adjacent

[116] Pharand, *supra* note 114, p. 48.

[117] L.F Liddle and W.N Burrell, "Problems in the Design of a Marine Transportation System for the Arctic," *Arctic and Alpine Research* 28, no. 3 (1975), 183–193, at 185.

[118] Claes L. Ragner, "Den norra sjövägen (The Northern Sea Route)," in *Barents – ett gränsland i Norden* ('*The Barents – A Nordic Borderland*'), ed. Torsten Hallberg (Stockholm: Arena Norden, 2008), pp. 114–127, at 114.

[119] Jensen, *supra* note 110, p. 2.

[120] Douglas Brubaker and Willy Østreng, "The Military Impact on Regime Formation for the Northern Sea Route," in *Order for the oceans at the turn of the century*, ed. Davor Vidas and Willy Østreng, 261–91 (The Hague; Boston: Kluwer Law International, 1999), at 261; there exist four different passages through the Northern Sea Route from the eastern Barents Sea to Bering Strait, one 'traditional' along the coast, one 'central', one 'high-latitudinal' and one 'close-to-the-pole', Douglas Brubaker, *The Russian Arctic straits* (Leiden, Boston: Nijhoff, 2005), p. 22.

[121] *Ibid*., p. 6; Brubaker and Østreng, *supra* note 120; the search for the "Northeast Passage" was commenced in the 16th century by several expeditions sent out by the European colonial powers (mainly Great Britain and the Netherlands), but it was not until 1879 that a passage through the strait was completed. That year, the Finnish-Swedish explorer *Adolf Erik Nordenskiöld* reached the Bering Strait onboard the steamer *Vega* (Ragner, *supra* note 118, at 115). The first time the whole route was completed by one navigation was the expedition guided by Otto Schmidt on the icebreaker Sibiryakov in 1932, Alexander S. Skaridov, "Northern Sea Route: Legal Issues and Current Transportation Practice," in *Changes in the Arctic environment and the law of the sea*, *supra* note 25, 283–306, at 283. From 1932 to the early 1950s, regular navigation was organised and a special fleet and ports were constructed; from the 1950s to the 1970s the NSR track development was completed and transformed into a normally functioning main line during the summer-autumnal seasons of navigation; year round use of the NSR started in the late 1970s, Alexander G. Granberg, "The northern sea route: trends and prospects of commercial use," *Ocean & Coastal Management* 41 (1998), 175–207, at 178.

[122] Jensen, *supra* note 110, p. 2.

land territories, it represents the most important exploitation area in the whole Arctic regarding "production output, manpower, number of settlements, geographical scope of activity, composition and range of activities".[123]

As seen above, in summer 2007 the Northwest Passage was completely ice-free for the first time in history. In 2008[124] and 2009[125] as well as in 2010[126] both the Northwest Passage and the Northern Sea Route opened up for a period of time.[127]

The seasonal or permanent opening of these shipping routes could drastically reduce the shipping distances for example between Europe and the east coast of North America and Asia: for example, the Northwest Passage provides a route between Asia and the Atlantic seaboard 7,000 km shorter than the route through the Panama Canal, implying corresponding savings on time, fuel and transit fees.[128] Some commentators have therefore presumed that the Northwest Passage might become the "Panama Canal of the north".[129]

Before the environmental risks resulting from an increase in Arctic shipping are analysed, a potential benefit of an increased use of the Northwest Passage and the Northern Sea Route should be considered: Shorter routes in the Arctic imply that there is a potential for lower stack emissions into the lower Arctic atmosphere during transits. However, the presence of sea ice may require higher propulsion levels and ultimately similar or greater emissions during voyages compared with other ocean routes.[130]

CO_2 emissions from international shipping in the Arctic region are estimated at 10,800 kilo tons (kt) CO_2 annually. Considering that total CO_2 emissions from

[123] Willy Østreng, "International use of the Northern Sea Route: What is the problem?," in *National security and international environmental cooperation in the Arctic*: *The case of the Northern Sea route*, ed. Willy Østreng, 1–21, Environment & policy 16 (Dordrecht: Kluwer Acad. Publ, 1999), at 3.

[124] Both Routes Around Arctic Open at Summer's End, NASA Earth Observatory, Image of the Day, September 9, 2008, available at: http://earthobservatory.nasa.gov/IOTD/view.php?id=9078, last visited 26 March 2012.

[125] Arctic Sea Ice News & Analysis, National Snow and Ice Data Center, September 17, 2009, Arctic sea ice reaches annual minimum extent, available at: http://nsidc.org/arcticseaicenews/2009/091709.html, last visited 26 March 2012.

[126] Arctic Sea Ice News & Analysis, National Snow and Ice Data Center, October 4, 2010, Weather and feedbacks lead to third-lowest extent, available at: http://nsidc.org/arcticseaicenews/2010/100410.html, last visited 26 March 2012.

[127] Open water does not mean that the water is free of sea ice. For the purposes of navigation "open water" is defined by the World Meteorological Organization as areas where the ice covers less than one-tenth of the surface, see. Ice Chart Colour Code Standard, World Meteorological Organization/Intergovernmental Oceanographic Commission, WMO/TD-No. 1215, 2004, JCOMM Technical Report No. 24, p. 3, available at: http://www.aari.nw.ru/gdsidb/docs/wmo/JCOMM%20TR24%20colour%20standard.pdf, last visited 26 March 2012.

[128] See Michael Byers, *Unfrozen Sea*: *Michael Byers sails the Northwest Passage* (27 March 2007), available at: http://www.ligi.ubc.ca/?p2=/modules/liu/publications/view.jsp&id=36, last visited 26 March 2012.

[129] Alanna Mitchell, "The Northwest Passage Thawed," *The Globe and Mail*, February 5, 2000.

[130] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 103.

international shipping globally are about 1,000 million metric tons (MMT) CO_2 per year, Arctic contributions seem to be neglectable in the global context. Yet, at the regional scale, pollutants such as black carbon (BC), particulate matter, nitrogen oxide (NOx), carbon monoxide (CO) and sulphur oxide (SOx) could have detrimental effects even in small quantities.[131]

For instance, deposition of black carbon considerably reduces the albedo of sea ice and snow. Thus, although the approximately 1,180 metric tons of black carbon released in the Arctic in 2004 represent only a small proportion of the estimated 71,000–160,000 metric tons released annually worldwide, they could have an immense impact on the climate in the region.[132]

As a consequence, the positive effects of a potential saving in CO_2—emissions are outweighed by the negative consequences of pollution through other substances produced by shipping. Other environmental impacts of marine traffic will be outlined below. Before that, the present extent of Arctic shipping and its possible future development will be depicted.

bb) Presence of Arctic Shipping Today

As mentioned, Arctic shipping was formerly restricted to the summer season and consisted mainly of intra-Arctic voyages. However, consequences of climate change for the Arctic, in particular decreased sea-ice extent and thickness, have already reduced the limitations for Arctic navigation and will continue to do so in the future.

Recognising these current and upcoming changes concerning shipping in the Arctic region, at the Ministerial Meeting in Reykjavik in November 2004, the Arctic Council instructed one of its Working Groups[133] to carry out a comprehensive Arctic marine shipping assessment (AMSA) as envisaged under the Arctic Marine Strategic Plan (AMSP). The outcome of that assessment—the Arctic Marine Shipping Assessment, or the AMSA 2009 Report[134]—was approved at the Ministerial Meeting in Tromsø in 2009.

A key requirement for the AMSA was the establishment of a database on Arctic marine activity. The Arctic States had to list the vessels in their respective Arctic waters for the chosen baseline year 2004. In that year, there were approximately 6,000 vessels in the Arctic region. Although this number does not appear to be very

[131] Current IMO regulations under MARPOL Annex VI that place requirements on the sulfur content of marine fuels, once implemented, will dramatically reduce SOx emissions from global shipping. As a result, observable impacts from SOx should decline and there may be indirect effects on the climate forcing properties of other air pollutants such as NOx and BC, *ibid*., p. 142.

[132] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 142.

[133] The Protection of the Arctic Marine Environment Working Group (PAME). More on the Arctic Council and its Working Groups *infra* Chap. 3, III. 1.

[134] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7.

high considering the size of the Arctic marine area[135] the shipping activity is rated as "significant in the context of both the unique aspects of the Arctic environment and the insufficient infrastructure and emergency response in many parts of the region, relative to southern waters."[136]

Four types of vessel activities were identified as most significant in the Arctic in 2004: community re-supply, bulk cargo, tourism and fishing vessel activity operations. Nearly half the vessels were operating on the Pacific Great Circle Route, which crosses the Aleutian Islands and the southern Bering Sea. Of the remaining vessels, about 50 %, or 1,600, were fishing vessels. The next largest group of vessels were bulk carriers with about 20 % of the total.[137]

Most of the reported voyages were destinational, meaning "the ship sails north, performs some marine activity, and sails south".[138] In other words, current Arctic marine shipping is predominantly intra-Arctic. Trans-Arctic voyages i.e. voyages taken across the Arctic Ocean from Pacific to Atlantic oceans or vice versa[139] have been few in number.[140]

cc) Potential Increase in Arctic Shipping

One of ACIA's key findings was that "[r]educed sea ice is very likely to increase marine transport".[141] The AMSA 2009 Report shares this prognosis and anticipates greater marine access and longer navigation seasons as a consequence of melting sea ice.[142]

The bulk transport of commodities such as oil, gas and ore is the sector that is expected to experience the most growth in the near future.[143] Besides natural resource development, regional trade was established as one of the main drivers of Arctic marine activity.[144]

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[135] The total number of vessels reported as operating in the Arctic region (fishing vessels and the Great Circle Route traffic excluded) represents less than 2 % of the world's registered fleet of oceangoing vessels over 100 gross tonnage, Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 89. It should be noted, however, that the availability of data and reporting on Arctic marine activity varied greatly between Arctic states; several states could not provide comprehensive data for 2004. Consequently, the AMSA database likely underestimates the levels of activity throughout the reporting year.

[136] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 89.

[137] *Ibid.*, p. 72.

[138] Lawson W. Brigham, "The Arctic Council's Marine Shipping Assessment," in *Changes in the Arctic environment and the law of the sea*, *supra* note 25, 159–76, at 165.

[139] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 12.

[140] Erik J. Molenaar and Robert Corell, "Arctic Shipping: Background paper," (Arctic Transform, 12 February 2009), p. 10.

[141] Hassol, *supra* note 1, at 82.

[142] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 4.

[143] *Ibid.*, p. 77.

[144] *Ibid.*, p. 5.

However, the report stresses that it is not receding sea ice alone that determines the future growth of Arctic shipping, but that other factors such as new resource discoveries or the development of the oil price are also of relevance.[145]

dd) Risks Attached to Arctic Shipping

(1) Sea Ice Remains Hazardous for Navigation

The AMSA 2009 Report emphasises that reduced sea ice does not mean that ice conditions for marine activities will automatically be less difficult.[146] After all, it needs to be kept in mind that Arctic waters will probably never be ice-free year-round, but that sea ice will always stay a prominent feature in this region.[147] Additionally, sea ice conditions do not remain stable, but show a great variability and are therefore hard to predict.[148]

Arctic ice poses serious hazards for shipping despite the use of powerful icebreakers and modern navigational aids. The often uneven pack ice[149] forms both pressure ridges up to 12 m high where floes collide, and narrow leads of open water, which can appear and disappear within hours. It drifts with the current and the wind. The Arctic also contains a considerable amount of shore-fast ice[150] that forms over shallow coastal waters. Additionally, the continental shelves are deeply scoured by icebergs[151] calved from glaciers,[152] the bottom edges of pressure ridges, and ice-islands breaking off from shore-fast "ice shelf" formations. Most of the icebergs form on Greenland and in the Canadian Archipelago and tend to drift toward the North Atlantic. They vary greatly in draft and shape: The mass of a large ice bergs can exceed 20 million tons, smaller bergs range up to 10,000 tons.[153]

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[145] *Ibid*., p. 93.

[146] *Ibid*., p. 4.

[147] No research or simulation has indicated that the winter sea ice cover will disappear during this century, see *ibid*., p. 25.

[148] Franklyn Griffiths, "New Illusions of a Northwest Passage," in *International Energy Policy*, *the Arctic and the Law of the Sea*, ed. Myron H. Nordquist, John N. Moore and Alexander S. Skaridov, 303–21 (Leiden: Martinus Nijhoff Publishers, 2005), at 308.

[149] Pack ice is defined as a large area of floating sea ice fragments that are packed together, Hassol, *supra* note 1, p. 24.

[150] Fast ice is sea ice that grows from the coast into the sea, remaining attached to the coast or grounded to a shallow sea floor, *ibid*.

[151] Icebergs are chunks of ice that calve off a glacier or ice sheet and float at the ocean surface, *ibid*.

[152] Glaciers and ice caps are land-based ice, with ice caps "capping" hills and mountains and glaciers usually referring to the ice filling the valleys, although the term glacier is often used to refer to ice caps as well, *ibid*.

[153] Barnaby J. Feder, "A Legal Regime for the Arctic," *Ecology Law Quarterly* 6 (1976–1978), 785–829, at 789; see Terence Armstrong, "Transportation of resources from and through the northern waters," in *Northern waters*: *Security and resource issues*, ed. Clive Archer and David Scrivener, 55–69 (London: Croom Helm for the Royal Institute of International Affairs, 1986), at 58.

Consequently, there will always be a significant potential hazard to navigation, and cautious and slow navigation will be required. Additionally, the long Arctic winter night in very high latitudes will make ice navigation more difficult than it would be in daylight.[154] This casts some doubt on the expected transportation cost savings from the reduced distances between Europe and the east coast of America and Asia.[155]

The AMSA Report's estimation with regard to trans-polar voyages is accordingly rather conservative: Through 2020, Arctic voyages are expected to be "overwhelmingly destinational".[156] Especially lacking marine infrastructure represents a considerable restraint for future Arctic marine operations.[157]

(2) Hazards for Arctic Ecosystems

Marine shipping generally bears numerous risks for natural ecosystems. In addition to the severe consequences that an accident can cause, especially when the vessel carries hazardous substances, the operational impacts of shipping must be considered. These include the release of substances through emissions to air or discharges to water,[158] accidental releases of oil or hazardous cargo, or disturbances of wildlife through collisions, the introduction of invasive alien species or noise introduced to the marine environment especially by the powerful engines of tankers.[159]

However, environmental hazards resulting from vessel traffic are much more serious in the Arctic region than in temperate zones because the Arctic marine environment is particularly endangered by potential impacts from marine activity: The migration corridors used by marine mammals and birds coincide broadly with the main shipping routes into and out of the Arctic. As the shipping season will probably extend to earlier in the spring and later into the fall as a consequence of climate change, overlaps with migrating animals will become more likely. Particularly during the spring migration, oil spills, ship strikes and disturbances could have severe impacts.[160]

As previously mentioned, Arctic species and ecosystems are particularly susceptible to disruption and destruction as they are highly specialised and show a pronounced seasonality. The stress and risks posed to them by Arctic climate

[154] Patrick R.M. Toomey, Global Warming: Arctic Shipping, Canadian Polar Commission, Meridian (Fall/Winter 2007), 6–11, at 6.

[155] Potts and Schofield, *supra* note 115, at 157.

[156] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 5.

[157] *Ibid.*

[158] For example through discharges of oily ballast and bilge water, see Arctic pollution issues, *supra* note 16, p. 150.

[159] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 134; Hal Mills, "The Environment and the Northwest Passage," in *Transit management in the Northwest Passage*, *supra* note 115, 8–64, at 58; Øystein Jensen, "Arctic shipping guidelines: towards a legal regime for navigation safety and environmental protection?" *Polar Record* 44 (2008): 107–114, at 107.

[160] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 136.

change will be aggravated by any potential repercussions of current or future shipping activity.[161]

(a) Oil Pollution The accidental release of oil or toxic chemicals is regarded as one of the most serious threats to Arctic ecosystems as a result of shipping, since it reduces the insulating properties of feathers and fur, possibly resulting in death due to hypothermia.[162]

Due to the unique Arctic circumstances, a single major oil tanker accident could have severe environmental consequences. Under normal (that is ice-free) circumstances, the part of the oil spilled at sea evaporates while the rest is dispersed in the water. Ice, however, can effectively limit this natural cleaning potential because it can trap the oil both above and below the water. Moreover, oil can remain in large pockets on the rough under surface of sea ice. Some of the oil might even be encapsulated.[163] This encapsulated oil does not break down but is released into the environment when the ice starts to melt.[164]

The release of oil can be very dangerous for birds and marine mammals, particularly in spring when access to open water is limited and consequently, the risk of animals congregating in oily areas is high. Therefore, winter oil spills should be cleaned up before spring comes.[165]

However, limited clean-up facilities increase the potential threat from oil spills in the Arctic.[166] Furthermore, fungi and bacteria that can use hydrocarbons as an energy resource and thereby facilitate clean-ups, are not as active in Arctic waters as they are in more temperate regions. Therefore, natural cleaning after a spill in the Arctic may take decades.[167] The slow destruction and therefore long circulation period of oil pollutants also means that these pollutants have a more widespread effect and may pollute vast areas.[168]

On top of that, the effects of ship-source pollution are aggravated in seas largely surrounded by land masses like the Arctic Ocean because non-biodegradable waste tends to be trapped in the marine environment for decades. Under these particular circumstances, it is vital that emphasis be placed on preventing pollution rather than on remedies.[169]

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[161] *Ibid.*; see Michael Byers and Suzanne Lalonde, *supra* note 115, at 1177 *et seq*.

[162] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 136.

[163] Arctic pollution issues, *supra* note 16, p. 152.

[164] W.J Campbell and S. Martin, "Oil and Ice in the Arctic Ocean: Possible Large-Scale Interactions," *Science* 181, no. 4094 (1973), 56–58, at 57.

[165] Arctic pollution issues, *supra* note 16, p. 152.

[166] *Ibid.*

[167] *Ibid.*, p. 153.

[168] Østreng, *supra* note 123, at 10.

[169] Vidas, *supra* note 60, p. 11; David L. VanderZwaag et al., "Governance of Arctic Marine Shipping," (Marine & Environmental Law Institute; Dalhousie Law School, 10 October 2008), p. 24.

(b) Noise The introduction of noise into the marine environment can adversely affect marine vertebrates' capacity to use sound for communication, foraging, reproduction, navigation and predator-avoidance, in extreme cases leading to habitat avoidance or even death.[170]

Sound produced by large vessels is of particular concern since its low frequency is similar to the general hearing sensitivity bandwidths of large whales and many fish species.[171] Icebreakers even generate stronger sounds than would normally be produced by ships of that size and power.[172]

(c) Invasive Species The introduction and spread of alien invasive species[173] is a severe threat to native biological diversity worldwide because the introduced species can "establish and invade the new habitats to the detriment of native species".[174]

Since monitoring of the Arctic marine environment is a difficult task due to the remoteness and size of the area, invasive species in the region have not been very well examined. However, it has for example been found that fish farms in Norway pose serious threats to the native Atlantic salmon populations through the escape of fish infected with a parasite and through interbreeding.[175]

The risk of introduction of invasive species into the Arctic marine environment will amplify with the increase of shipping volume in this region.[176] Sources for introduction are ballast water discharge, hull fouling, cargo operations and casualties or shipwrecks.[177]

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[170] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 145.

[171] *Ibid*., p. 146.

[172] The sound of breaking the ice corresponds to a noise level of 170 decibel (dB) (re: 1 μPascal at 1 metre), Elena M.McCarthy, "International Regulation of Transboundary Pollutants: The Emerging Challenge of Ocean Noise" *Ocean and Coastal Law Journal* 6 (2001), 257–292, at 266. In addition to the high level of noise, all icebreaking operations can potentially cause disturbances to wildlife through the trail of open water left abaft, Arctic Marine Shipping Assessment 2009 Report, 7, p. 146.

[173] The term "invasive alien species" is understood in correspondence to the definition by the COP to the CBD and accordingly refers to "an alien species whose introduction and/or spread threaten biological diversity", see COP 6 Decision VI/23, Alien species that threaten ecosystems, habitats or species, fn. 57. "Alien species" means "a species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce", *ibid*.

[174] Status, impacts and trends of alien species that threaten ecosystems, habitats and species, Convention on Biological Diversity, Subsidiary Body on Scientific, Technical and Technological Advice, Sixth Meeting, Montreal, 12–16 March 2011, UNEP/CBD/SBSTTA/6/INF/11, p. 5.

[175] D.A. Levin/J. Francisco-Ortega/R.K. Janzen, "Hybridisation and the extinction of rare plant species". *Conservation Biology* 10 (1996): 10–16.

[176] Christopher R. Pyke *et al*., "Current Practices and Future Opportunities for Policy on Climate Change and Invasive Species". *Conservation Biology* 22, no. 3 (2008): 585–592, at 588.

[177] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 150.

Ballast water means "water with its suspended matter taken on board a ship to control trim, list, draught, stability or stresses of the ship".[178] This water can contain various marine species, essentially anything passing through a ship's ballast water intake pumps and ports. Under favourable conditions, these species may establish a reproductive population in the host environment. In the worst case, they may out-compete native species and grow into pest proportions.[179]

In addition to ballast water discharge, in subarctic waters, aquatic invasive species are introduced through transfer on the hulls of ships. Another pathway is the movement of invasive species in cargo. Since much of the sealift and re-supply movements into the Arctic are palletized, the risk of unwanted organisms being drawn along in the cargo is elevated.[180] Alien invasive species can also be introduced into the Arctic marine environment through ship accidents and sinkings.[181]

(d) Lack of Infrastructure and Cooperation Due to their remoteness, polar waters are generally far away from the centres of human civilisation and from the normal availability of port services and rescue capability.[182] Therefore, navigational mistakes can have fatal consequences, both for the operators and the environment.[183]

As mentioned above, the Arctic region is generally lacking sufficient marine infrastructure. This shortage, combined with the vastness and harshness of the environment, makes emergency responses particularly complicated in the Arctic.[184]

The AMSA report also identified a lack of systematic collecting and sharing data about Arctic marine activity among the Arctic states. Likewise, information about vessel incidents and accidents in the Arctic is not shared, other than through IMO processes. However, this information is an important step toward understanding and assessing future risks.[185]

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[178] International Convention for the Control and Management of Ships Ballast Water and Sediments, adopted 13 February 2004, text available at: http://www.ecolex.org/server2.php/libcat/docs/TRE/Multilateral/En/TRE001412.pdf, last visited 26 March 2012.

[179] See IMO, Global Ballast Water Management Programme, The Problem, available at: http://globallast.imo.org/index.asp?page=problem.htm&menu=true, last visited 26 March 2012.

[180] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 150.

[181] For example, shipwrecks in the Aleutians have caused significant ecological damage through the introduction of predatory rat species onto islands that have large aggregations of nesting seabirds, *ibid*., p. 151.

[182] Lawson W. Brigham, "The emerging International Polar navigation Code: bi-polar relevance?" in *Protecting the polar marine environment*, *supra* note 60, 244–62, at 244.

[183] Jensen, *supra* note 110, p. 2.

[184] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 5.

[185] *Ibid*., p. 91; the Arctic coastal states recognised this risk: "The Arctic Ocean is a unique ecosystem (. . .). Experience has shown how shipping disasters and subsequent pollution of the marine environment may cause irreversible disturbance of the ecological balance and major harm to the livelihoods of local inhabitants and indigenous communities. (. . .) Cooperation, including on the sharing of information, is a prerequisite for addressing these challenges.", The Ilulissat Declaration, Arctic Ocean Conference Ilulissat, Greenland, 27–29 May 2008, available at: http://

b) Fishing

aa) Fish species in the Marine Arctic

Arctic and sub-Arctic waters are the habitat of more than 150 species of fish. However, Arctic fish communities are dominated by few species. The most abundant ones are Greenland halibut, polar cod, Atlantic and Pacific cod, Greenland cod, walleye pollock, capelin, long rough dab, yellowfin sole, Atlantic and Pacific herring, and redfish.[186]

Greenland halibut, polar cod, and capelin have a circumpolar distribution, while Greenland cod is restricted to Greenland waters. The other species can generally be found in waters to the south of the Arctic Ocean, except for parts of the Barents and Chuckchi Seas.[187]

bb) Impacts of Climate Change on Fish

Climate change has both a direct effect on fish, e.g. through changes in growth as well as in metabolic or reproductive processes, and an indirect effect through changes to their biological environment (i.e., in relation to their predators, prey, species interactions, and disease).[188] Since fish are ectothermic, i.e. cold blooded,[189] temperature is the decisive environmental factor. It controls the rates of all physiological processes such as feeding or metabolism that influence individual growth.[190]

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www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf, last visited 26 March 2012. Recently, the Arctic Eight have concluded the Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic (Arctic Search and Rescue Agreement), signed 12 May 2011, will enter into force 30 days after receipt of last notification that internal procedures for its entry into force have been fulfilled, see article 19(3) Arctic Search and Rescue Agreement, available at: http://arctic-council.npolar.no/accms/export/sites/default/en/meetings/2011-nuuk-ministerial/docs/Arctic_SAR_Agreement_EN_FINAL_for_signature_21-Apr-2011.pdf, last visited 26 March 2012. The Arctic Search and Rescue Agreement establishes the Search and Rescue (SAR) responsibility of each state party by defining an area of the Arctic in which it has the lead responsibility in organising responses to SAR incidents.

[186] *AMAP assessment report*: *Arctic pollution issues*, *supra* note 19, p. 132.

[187] Loeng *et al*., *supra* note 84, p. 484.

[188] Loeng *et al*., *supra* note 84, p. 494 *et seq*., 507.

[189] Willy Østreng, "The post-Cold War Arctic: Challenges and transition during the 1990s," in *Arctic Development and Environmental Challenges*: *Information needs for decision-making and international co-operation*. Ringkjøbing/Gentofte: Scandinavian Seminar College, distributed by Erling Olsens Forlag, 1997; Papers from a Nordic Policy Seminar, Arendal, Norway, September 8–10, 1996, 33–49, at 35.

[190] Loeng *et al*., *supra* note 84, p. 495.

Climate shifts could affect fish population abundance, mainly by influencing recruitment,[191] as recruitment patterns are heavily impacted by oceanographic processes such as local wind patterns and mixing and prey availability during early life stages.[192] Studies show that fish populations inhabiting areas at the lower end of the overall temperature range of the species had above-average recruitment with positive temperature anomalies, whereas populations in warmer zones cope better with negative temperature anomalies.[193]

Climate change may also change the "abundance, quality, size, timing, spatial distribution, and concentration of prey"[194] as well as the amount and allocation of predators.[195] Furthermore, fish may be impacted by changed salinity and oxygen conditions as well as by altered ocean mixing and transport processes.[196]

Temperature is also one of the key aspects determining the distribution pattern of fish since most fish species and stocks tend to prefer a specific temperature range. Thus temperature changes can result in expansion or contraction of the distribution range of a species.[197] Under the anticipated climate change scenarios, poleward extensions[198] of the distribution range for numerous fish species are highly probable.[199]

Initially, the temperature increase resulting from climate change is likely to benefit some fish stocks that are currently threatened as well as increase habitat for some species.[200] Moderate warming would probably lead to a better access to food for species such as herring and cod because less ice and higher temperatures would in all likelihood increase the productivity of their prey. However, as discussed above, assessments suggest a considerable rather than a moderate temperature increase. It is not clear whether an Arctic region that has warmed to such an extent would e.g. be an appropriate habitat for demersal fish.[201]

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[191] The number of young surviving long enough to potentially enter the fishery, *ibid*., p. 495.

[192] *Ibid*., p. 507.

[193] *Ibid*., p. 495.

[194] *Ibid*., p. 507.

[195] *Ibid.*

[196] *Ibid*., p. 494.

[197] *Ibid.*

[198] This implies extension into areas beyond national jurisdiction, which is significant for the conservation and management regime prevailing over the respective fish stocks. Regarding this issue see *infra* Chap. 3, V.

[199] Fish species that would probably move northward include "Atlantic and Pacific herring and cod, walleye Pollock in the Bering Sea, and some of the flatfishes that might presently be limited by bottom temperatures in the northern areas of the marginal arctic seas. The southern limit of colder water fishes such as polar cod and capelin would be very likely either to shift its southern boundary northward or restrict its distribution more to continental slope regions. Salmons, which show high fidelity of return to natal streams, might possibly be affected in unknown ways that relate more to conditions in natal streams, early marine life, or feeding areas that might be outside the Arctic." Loeng *et al*., *supra* note 84, p. 507.

[200] E.g. herring and cod, Erik J. Molenaar et al., "Introduction to the background papers," (Arctic Transform, 8 September 2008), p. 7.

[201] WWF-Norway, WWF International Arctic Programme, Factsheet, Effects of Climate Change on Arctic Fish, Oslo February 2008, p. 3, available at http://awsassets.panda.org/downloads/

Consequences of climate change for the marine Arctic also threaten fish populations with regard to another aspect: Annual stocks of any species are strongly influenced by the correspondence of spawning season with access to food for young fish. The risk of the "mismatch" effects is one of the most serious aspects of climate change. Moreover, if climate change eventually alters the speed and direction of ocean currents, the consequent impact on access to nutrients and the distribution of larvae and growing organisms would influence recruitment, growth and mortality of stocks.[202]

There are four major ecosystems and respective fisheries in the Arctic region: the North-east Atlantic—Barents and Norwegian Seas, the Central North Atlantic—Iceland and Greenland, the Newfoundland and Labrador Seas and North-eastern Canada and North Pacific—Bering Sea. These areas show significant differences in that the Barents Sea and Icelandic waters show a rather temperate climate, while the Greenland waters off northeast Canada and the Bering Sea are more heavily influenced by Arctic climate. Thus, the effects of climate change could be quite different for each individual zone. Additionally, these areas vary with regard to species interaction and fishing pressure.[203] Global warming will probably cause an ecosystem shift in some regions, altering species composition. Population sizes, growth rates and stock distribution are expected to changes, as the changing environmental conditions are probably detrimental to some fish species and favourable for others.[204]

Consequently, certain species will at some stage disappear, while others will enter the region and population sizes of individual species will change as well,[205] a factor to which commercial fisheries will need to adapt.

cc) Fisheries in the Marine Arctic

Some of the world's largest, commercially exploited fish stocks inhabit the Arctic region. The main target species for commercial fishing include Pacific salmon and Atlantic cod. Other commonly fished species are pollock, halibut, coley, redfish, haddock, king crab, snow crab and pacific cod.[206]

arctic_fish_factsheet.pdf, last visited 26 March 2012; Vilhjámsson/Hoel et. al., Arctic Climate Impact Assessment, *supra* note 5, at 770.

[202] WWF-Norway, *supra* note 201, p. 2.

[203] Vilhjálmsson/Hoel *et al*., *supra* note 5, p. 771.

[204] *Ibid*., p. 770.

[205] Erik J. Molenaar and Robert Corell, "Arctic Fisheries: Background Paper," (Arctic Transform, 9 February 2009), p. 10.

[206] WWF-Norway, *supra* note 201, p. 1. Approximately 40 % of the United States' commercial fisheries (by weight) stem from the Bering Sea and about half of the fish consumed in the European Union is from the European Arctic.

As mentioned above,[207] the AMSA Report found that fishing vessels made up the largest group of vessel activity in the Arctic marine area, with a share of more than 50 % of the total shipping activity. In 2004, approximately 1,600 fishing vessels were active in the region,[208] with most Arctic fishing taking place in the Bering and Barents seas, on the west coast of Greenland and around Iceland and the Faroe Islands.[209] As a result of greater access to ice-free waters, fishing in Arctic waters is likely to increase.[210]

It is difficult to predict where new fishing opportunities will occur and for which species. Likewise, it is hard to prognosticate which states will benefit or suffer and how subsistence fishing will be affected, especially with regard to competition with commercial fishing. In this context, the effects of other human activities that might increase as a result of climate change have to be born in mind as well: shipping and extractive activities in particular may spatially compete with fishing or impact them, e.g. by pollution.[211]

However, overfishing is already a serious threat to fish populations in the Arctic. More than 50 % of the North-east Atlantic regional stocks of cod, haddock, whiting and saithe are threatened with collapse.[212] The ACIA Report concludes that the overall consequences of climate change will probably be less important than fisheries policies and their enforcement: "The significant factor in determining the future of fisheries is sound resource management practices, which in large part depend upon the properties and effectiveness of resource management regimes."[213] An example supporting this affirmation is the collapse of the "northern cod" off Newfoundland and Labrador.[214]

So the net effect of climate change on fish stocks and commercial fisheries in the Arctic is uncertain, since the management of fisheries and the adaptation of management structures will play a decisive role as the effects of climate change continue to emerge.

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[207] See *supra* a) bb).

[208] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 4.

[209] *Ibid.*, p. 72.

[210] *Ibid.*, p. 123.

[211] Molenaar and Corell, *supra* note 205, p. 4; Erik J. Molenaar, "Arctic Fisheries Conservation and Management: Initial Steps of Reform of the International Legal Framework," in *The Yearbook of Polar Law*, ed. Gudmundur Alfredsson and Timo Koivurova, 427–64 1 (Leiden Boston: Martinus Nijhoff Publishers, 2009), at 433; Vilhjálmsson/Hoel, Arctic Climate Impact Assessment, *supra* note 5, at 770.

[212] Mikhail Gorbachev, The Speech in Murmansk at the ceremonial meeting on the occasion of the presentation of the Order of Lenin and the Gold Star Medal to the city of Murmansk: October 1, 1987 (Moscow: Novosti Press Agency, 1987), p. 730; reprinted on http://www.barentsinfo.fi/docs/Gorbachev_speech.pdf, last visited 26 March 2012.

[213] Vilhjálmsson/Hoel *et al*., Hoel, Arctic Climate Impact Assessment, *supra* note 5, p. 770.

[214] *Ibid.*, p. 692.

c) Oil and Gas Exploitation

aa) Development of Oil and Gas Exploitation in the Arctic

In some Arctic areas, oil seeps have been known and used for thousands of years.[215] Oil and gas exploration and exploitation began in the 1920s, but expanded rapidly in the second half of the twentieth century. Onshore commercial activities started more than 80 years ago at Norman Wells, Northwest Territories, Canada. After World War II, extensive oil and gas exploration began in the Mackenzie Delta of Canada, in northern Russia and in northern Alaska. Since the 1960s, wide-spread and intensive operations have occurred in several places after the discovery of large oil and gas reserves in the Yamalo-Nenets Autonomous Okrug and the Nenets Autonomous Okrug in Russia, on Alaska's North Slope, and in the Mackenzie Delta.[216] Offshore exploration began in the 1970s and early 1980s in all Arctic countries with petroleum provinces. During the 1980s and 1990s, oil and gas activities both onshore and offshore accelerated due to new techniques and extended farther into the Arctic.[217]

Today, the Arctic production of oil and gas amounts to billions of cubic metres corresponding to about a tenth of the world's oil and a quarter of its gas. At present, about 80 % of this oil and 99 % of this gas come from Russia.[218]

bb) Future Development

It is estimated that the Arctic region may contain up to 25 % of the world's undiscovered oil and gas reserves.[219] In 2009, the United States Geological Survey (USGS) has completed its first comprehensive assessment of undiscovered oil and gas. According to this appraisal, it is estimated that the area north of the Arctic Circle holds 90 billion barrels of technically recoverable natural oil, 1,670 trillion cubic feet of technically recoverable natural gas, and 44 billion barrels of technically recoverable natural gas liquids. Altogether, these resources make up 22 % of the undiscovered, technically recoverable resources in the world (13 % of the undiscovered oil, 30 % of the undiscovered natural gas, and 20 % of the undiscovered natural gas liquids in the world). About 80 % of the estimated resources are anticipated to occur offshore.[220] Although this estimate can be

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[215] Huntington *et al*., Arctic Oil and Gas 2007, AMAP, Oslo 2007, p. 1.

[216] *Ibid*., p. 13 f.

[217] Skjoldal, Hein Rune, *et al*., AMAP Assessment 2007: Oil and Gas Activities in the Arctic – Effects and Potential Effects, p. 7_2.

[218] Huntington *et al*., *supra* note 215, p. 17.

[219] See Scott G. Borgerson, "Arctic Meltdown: The Economic and Security Implications of Global Warming," *Foreign Affairs* 87 (2008), 63–77, at 67.

[220] Brenda S. Pierce, "US Geological Survey Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas in the Highest Northern Latitudes," in *Changes in the Arctic environment and the law of the sea*, *supra* note 25, 535–6, at 536.

disputed, it seems more than likely that the Arctic holds a large amount of undiscovered resources. Norway, Russia and the United States are considered to have the largest amount of undiscovered Arctic oil resources, whereas Canada, Russia and the United States are considered as having the majority of undiscovered Arctic gas. Increasing global demand puts pressure on the exploitation of these resources. Areas that are expected to hold a high resource potential are being considered for more focused exploration activities. Areas are being made available for exploration licensing and leasing throughout the Arctic.[221]

In the near-term (<10 years) oil and gas activities are likely to increase in Russia (northern Timan-Pechora and West Siberia provinces, Kara and Barents Sea), in the United States (North Slope in Alaska and Federal onshore and offshore lands), Canada (e.g. the Mackenzie Delta) and Norway (Norwegian and Barents Sea). These activities include onshore and offshore exploitation, and are accompanied by the construction of pipelines and tanker traffic to the relevant markets.[222]

cc) Environmental Hazards Resulting from Oil and Gas Exploitation

Increasing oil and gas development involves considerable risks for the vulnerable Arctic environment. At sea, oil spills are considered the greatest danger for the marine environment.[223] As explained above, oil is extremely difficult to clean up under icy conditions and can spread over large areas. Furthermore, experience from the Exxon Valdez oil spill has shown that effects from exposure to oil spills can last for decades for aquatic animals.[224] The tanker grounded on Bligh Reef in Alaska's Prince William Sound on March 24, 1989, and ruptured its hull and spilled over 40,000 tonnes of Prudhoe Bay crude oil[225]; recent studies from the subarctic indicate that five of the nine seabird species affected by the Exxon Valdez incident have not yet recovered.[226] The overall effects of oil spills on ecosystems are still poorly understood.[227]

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[221] Skjoldal *et al*., *supra* note 217.

[222] *Ibid*., p. 7_3.

[223] As seen recently during the Deepwater Horizon oil spill, when thousands of barrels of oil a day gushed from a seabed well since the Deepwater Horizon drilling rig exploded on 20 April 2010 about 40 miles southeast of the Louisiana coast, it is extremely difficult to stop and clean up an offshore oil spill even in temperate regions, see Jonathan Owen, "BP boss defends company against Obama's attack: The US President calls for those behind the Gulf of Mexico oil spill to take full responsibility," *The Independent world*, May 16, 2010, http://www.independent.co.uk/news/world/americas/bp-boss-defends-company-against-obamas-attack-1974692.html.

[224] Huntington *et al*., *supra* note 215, p. vi.

[225] See NOAA, Emergency Response, Recent and Historical Incidents, Response to the Exxon Valdez Spill, available at: http://response.restoration.noaa.gov/oil-and-chemical-spills/significant-incidents/exxon-valdez-oil-spill/response-exxon-valdez.html, last visited 26 March 2012.

[226] Huntington *et al*., *supra* note 215, p. 24.

[227] *Ibid*., p. 23.

In summary, oil and gas exploitation in the sensitive Arctic marine environment implies considerable operational risks and could cause possibly disastrous impacts in the case of a major spill.[228]

II Other Environmental Concerns in the Arctic

In addition to the consequences of climate change for the Arctic marine environment listed above, and the risks attached to them, the region also suffers from other environmental concerns. First of all, the region is a sink for contaminants generated in the south and transported to the Arctic by air and water currents. Furthermore, due to low temperatures, pollutants take considerably more time to break down than in temperate regions.[229] Moreover, as mentioned above, the unique Arctic ecosystems are particularly affected by pollutants and other environmental hazards like noise.

In 1991, the Arctic states identified six environmental problems as priorities for trans-national management.[230] These are acidification, persistent organic pollutants (POPs), oil pollution, heavy metals, noise and radioactivity.[231]

1 Acidification and 'Arctic Haze'

a) Acidification

Acidification comes about when soil or water bodies are not capable to (fully) resist or neutralise deposited acidifying atmospheric compounds. These occur as wet deposition contained in rain or snow, or as dry deposition as particles or gases. If acid deposition rates constantly exceed their levels of tolerance, ecosystems can ultimately completely lose their neutralising or buffering capacity.[232]

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[228] With regard to the consequences the eventual use of the exploited resources for the climate one has to concur with Shaw: "There is something paradoxical about seeking in the Arctic the very carbon fuels that are melting the northern ice." Richard Shaw, "A Russian Flag at the North Pole?" *The journal of international maritime law* 13, no. 4 (2007), 232–233, at 232.

[229] See Brettania Walker and Raphaela Stimmelmayr, "The tip of the iceberg: Chemical contamination in the Arctic," (WWF International Arctic Programme, February 2005), p. 8.

[230] For more details, see *infra* Chap. 3, III. 1.

[231] Rovaniemi Declaration, Declaration on the protection of the Arctic Environment, Rovaniemi, 14 June 1991, p. 1.

[232] See Finland's environmental administration, State of the environment, Acidification, available at: http://www.environment.fi/default.asp?node=6027&lan=EN, last visited 26 March 2012.

In the Arctic, the major acidifying compounds are sulphur oxides, formed when fossil fuels burn and when sulphide ores are smelted. Most sulphur in Arctic air comes from industrial areas further south. The major global sources are Eurasia (40 %) and eastern North America (20 %).[233]

Within the Arctic region, the greatest emissions of acidifying substances are created by the production of copper, nickel and other non-ferrous metals from sulphur-bearing ores. Additionally, the oceans emit sulphur to the atmosphere in the form of dimethyl sulphide.[234]

Air and glacier ice analyses show, that sulphur deposition in northern Canada, Alaska and Greenland is low, while they are relatively high in the Barents and Taimyr regions, with levels ranging from slightly above background to several grams of sulphur per square metre in areas close to Russian smelters—a level as high as in the polluted areas of central Europe.[235]

b) 'Arctic Haze'

Visible Arctic aerosol pollution known as 'Arctic Haze' is a phenomenon first noticed between the late 1940s and 1950s by weather reconnaissance missions of the U.S. Air Force.[236] It consists of sulphate (up to 90 %), soot, and sometimes dust and originates from anthropogenic sources outside the Arctic, mostly in Eurasia.[237]

'Arctic haze' is thought to contribute to climate change in the Arctic. Whereas aerosol pollution probably cools local climates at midlatitudes by amplifying reflection of sunlight, in the Arctic it can increase absorption of radiation, e.g. by increased light absorption through deposited soot on snow that darkens the surface, and thus add to warming of the region.[238]

c) Ocean Acidification

Acidifying compounds also threaten the oceans: These absorb carbon dioxide, which reacts with the seawater to form carbonic acid—a process called ocean acidification.[239] Increased CO_2-concentration in the atmosphere leads to higher

[233] *AMAP assessment report*: *Arctic pollution issues*, *supra* note 19, p. 130.

[234] *Ibid*., p. 131 *et seq*.

[235] *Ibid*., p. 134.

[236] Timothy J. Garrett and Lisa L. Verzella, LOOKING BACK: An Evolving History of Arctic Aerosols, Bulletin of the American Meteorological Society 89, no. 3 (2008), 299–302, at 299.

[237] *AMAP assessment report*: *Arctic pollution issues*, *supra* note 19, p. 134.

[238] Garrett and Verzella, *supra* note 236, p. 301 *et seq*.

[239] Richard A. Feely, Christopher L. Sabine, and Victoria J. Fabry, Carbon Dioxide and our Ocean Legacy, The Pew Charitable Trusts, April 2006, p. 1, available at: http://www.pmel.noaa.gov/pubs/PDF/feel2899/feel2899.pdf, last visited 26 March 2012.

levels of carbon dioxide in the oceans because marine waters take up the gas from the atmosphere.[240] The natural process of carbon dioxide uptake by the oceans has helped to mitigate global warming by reducing greenhouse gas concentrations in the atmosphere.[241] However, elevated carbon dioxide concentrations in the oceans have led to a decrease in average pH of the ocean's surface layer of 0.12 units on the pH scale (to 8.1) since the beginning of the industrial revolution. This corresponds to a 30 % increase in acidity.[242] This "other CO_2 problem"[243] as it has been called leads to problems for corals, clams and mussels in that they encounter difficulties in building up their skeletons and shells, and might imply threats for all marine animals by affecting growth and reproduction.[244]

2 Persistent Organic Pollutants (POPs)

Persistent Organic Pollutants (POPs) comprise a variety of substances, like industrial chemicals, by-products of industrial processes, pesticides and herbicides. Such substances include polychlorinated biphenyls (PCBs), hexachlorobenzene (HCB), dioxins, dichlordiphenyltrichloroethanes (DDTs) and lindane (HCH).[245]

These substances are of concern because they are often toxic and can adversely affect the health of fish, wildlife, and humans.[246] The detrimental effects concern reproduction, the immune system and increased risk of tumours.[247]

POPs tend to bioaccumulate and many of the substances biomagnify in food chains. Therefore, POPs can reach very high concentrations in top predators even when levels in air, soil and water are low. Since many POPs are not broken down or excreted, concentrations rise with each step from prey to predator. This is compounded by the fact that fat reserves are crucial for the survival of Arctic animals in the cold climate, leading to the biomagnification of lipid-soluble POPs in high end predators in the region.[248] Marine mammals, such as polar bear, Arctic

[240] See Macko, *supra* note 91, at 114.

[241] Over the past 200 years the oceans have absorbed 525 billion tons of carbon dioxide from the atmosphere, or nearly half of the fossil fuel carbon emissions over this period, Feely *et al*., *supra* note 239.

[242] Marah J. Hardt and Carl Safina, "Threatening Ocean Life from the Inside Out," *Scientific American* 303, no. 2 (August 2010), 66–73, at 68.

[243] E.g. Scott C. Doney *et al*., "Ocean Acidification: The Other CO_2 Problem", *Annual Review of Marine Science* 2009. 1:169–92.

[244] *Ibid.*

[245] AMAP Fact Sheet # 1, October 2000, p. 1; Barry C. Kelly *et al*., "Food Web–Specific Biomagnification of Persistent Organic Pollutants," *Science* 317, no. 5835 (2007), 236–239, at 236.

[246] Kelly *et al*., *ibid.*

[247] Arctic pollution issues, *supra* note 16, p. 73.

[248] ACAP Fact Sheet # 1, October 2000, p. 3.

fox, different whale species and others, as well as some marine birds and birds of prey tend to carry the highest body burdens.[249]

POPs can persist in the environment for long periods of time, allowing them to be transported large distances from their sources. Those substances of concern in the Arctic mostly stem from temperate and warmer areas of the world and reach the Arctic by long-range transport via air currents.[250]

3 Oil Pollution

As shown above, oil pollution represents a considerable risk for the sensitive Arctic environment. The consequences of major oil pollution incidents have been witnessed after the aforementioned *Exxon Valdez* incident in 1989 with respect to the marine environment and in 1994 concerning land pollution: a ruptured pipeline in Usinsk in the Komi Republic of Russia resulted in thousands of cubic meters of crude oil spread over the surrounding wetlands, leading to severe damage to the vegetation and wildlife.[251]

The greatest environmental risk for hydrocarbon pollution derives from the exploitation and transport of oil and gas resources. Operational discharges of oil from ships and runoff from land, discharges in waste water, and atmospheric deposition add to the pollution. Another significant source is natural oil seeps.[252]

Generally, petroleum hydrocarbon concentrations are low in the Arctic environment. The largest contributor is oil spills, followed by industrial activity. Although human inputs only make up a small part of the overall petroleum hydrocarbon pollution in the Arctic at present, they can be responsible for considerable local pollution. However, as described above, oil and gas activities in the Arctic are expected to intensify considerably, and if they do as projected, these activities may contribute an increasingly significant proportion of the input of petroleum hydrocarbons to the Arctic during the next few decades.[253]

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[249] AMAP Assessment, Persistent Organic Pollutants in the Arctic, 2002, p. xi. As indigenous people consume species higher up the Arctic food chain as part of their traditional diet, average POP intakes of these people are usually higher than those of people living in southern latitudes. Pregnant women and children are of great concern, because children are associated with the greatest vulnerability during the early years of life, ACAP Fact Sheet # 1, October 2000, *supra* 248, p. 4.

[250] Arctic pollution issues, *supra* note 16, p. 91.

[251] Arctic pollution issues, *supra* note 16, p. 145.

[252] *Ibid*., p. 146.

[253] Huntington *et al*., Arctic Oil and Gas 2007, AMAP, Oslo 2007, p. vi.

4 Heavy Metals

Concerns regarding heavy metals deal mainly with cadmium, lead and mercury, which can already be toxic at levels only moderately above background levels. In some regions of the Arctic, they are thought to be present at levels possibly posing risks to the environment and to human health.[254]

Although metals occur naturally in the environment, significant quantities of heavy metals are now introduced and redistributed into the global environment from human activities such as industrial processes, agricultural practices, transportation, and waste disposal.[255] The Arctic environment is affected by emissions in source regions both within and outside the Arctic.[256] Within the Arctic, combustion of fossil is a main anthropogenic source of heavy metals, followed by industrial processes, especially in the Russian Arctic.[257]

As mentioned above, one of the priority pollutants in the Arctic is mercury, which is toxic to all living organisms. Analyses show that a significant increase in mercury deposition occurs during the polar sunrise, triggered by photochemical reactions in the surface layer of the atmosphere, transforming mercury to a form easily deposited and absorbed by organisms. These "mercury depletion events"[258] are estimated to deposit about 150–300 tonnes of mercury per year in the Arctic.[259]

5 Noise

The noise environment in Arctic waters is unique in that it is heavily impacted by ice formation, melt, deformation and movement.[260] Noise types and levels created by human activities may disturb marine mammals, or drown the "natural" sounds of importance to them, in some cases possibly leading to mortality through stampedes or abandonment.[261]

Moving sound sources such as ships seem to be more disturbing than stationary sources like dredges. The impacts on fish and wildlife of cumulative exposure to noise are poorly understood.[262]

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[254] Arctic pollution issues, *supra* note 16, p. 94.

[255] Pacyna, AMAP Assessment 2002: Heavy Metals in the Arctic, p. 5.

[256] *Ibid.*, p. 7.

[257] Arctic pollution issues, *supra* note 16, p. 97.

[258] AMAP/ACAP, Fact Sheet, Mercury – a priority pollutant, January 2005, p. 1.

[259] *Ibid.*

[260] AEPS, Declaration on the protection of the Arctic environment, p. 16.

[261] *Ibid.*, p. 17.

[262] *Ibid.*

6 Radioactivity

Radioactivity is defined as the "spontaneous disintegration (decay) of atomic nuclei accompanied by the emission of ionising radiation".[263] Exposure to radiation may have detrimental health effects, which are proportionate to the dose received by organisms, including humans. Determining what levels of radioactivity will cause damage to human health is a complex calculation, depending on whether exposure is external or internal, and whether radionuclides were inhaled or ingested.[264] Furthermore, it is influenced by the mobility of different radionuclides in the environment and by accumulation in important foodstuffs.[265]

The major anthropogenic source in the Arctic is atmospheric testing of nuclear weapons, followed by routine releases from European nuclear fuel reprocessing plants and fallout from the Chernobyl accident 1986. Contamination may also result from nuclear waste, radioactive waste and nuclear fuel.[266]

However, the greatest potential for radioactive contamination of the Arctic is associated with 'potential sources', including the release of radionuclides due to accidents during production, transport, waste disposal, and storage; natural events such as floods or storms, which can release, mobilize, or redistribute contaminants; and accidental releases.[267]

Of particular concern is the high concentration of radioactive sources in north-west Russia, mainly in the form of decommissioned nuclear submarines of the Russian Pacific Fleet. Also, the handling and storage of spent nuclear fuel poses the risk of releasing significant quantities of radionuclides into the Arctic environment.[268]

III Summary

The consequences of climate change are experienced particularly intensely in the Arctic. To delimitate the region around the North Pole referred to by this term, different definitions are used—based on geographical, climatological, vegetative or oceanographical criteria. The denotation this study draws upon is the definition of the Arctic established by one of the Working Groups of the Arctic Council, the most important forum for cooperation in the area. According to this definition, broadly speaking, the Arctic (marine) Region comprises the Arctic Ocean, the Bering,

[263] ACAP Fact Sheet # 2, *supra* 248, p. 1.

[264] Radionuclides are radioactive isotopes of elements, AMAP Fact Sheet # 2, May 2001, p. 1.

[265] Arctic pollution issues, *supra* note 16, p. 112.

[266] *Ibid.*

[267] ACAP Fact Sheet # 2, *supra* 248, p. 2.

[268] *Ibid*, p. 3.

Chuckchi, Beaufort, Laptev, Kara, Barents, Norwegian and Greenland Sea as well as Baffin and Hudson Bay.[269]

Over the past decades, air temperatures in this area have risen at almost twice the mean global rate. The reasons for this phenomenon called "Arctic amplification" include several feedback processes. Most prominently, increasing air temperatures cause the melting of sea ice in the marine Arctic. Consequently, the newly exposed ocean absorbs more solar energy, which was reflected by the ice before. This causes more sea ice to melt, which again leads to greater absorption of sunlight—a self-reinforcing cycle that will accelerate the loss of sea ice, eventually resulting in an ice-free marine Arctic during summer time.

Loss of sea ice has various consequences for Arctic marine ecosystems. Some species, like the ice bear, are directly dependent on the presence of sea ice as habitat and hunting area. With the retreating sea ice, populations suffer a dramatic decline. Moreover, the entire Arctic ecosystems may be threatened by the decline of low trophic level organisms like algae, forming the basis of the food web, whose growth is advanced by sea ice.

However, Arctic ecosystems are not affected by the direct consequences of climate change alone: The retreating and thinning sea ice makes the Arctic much more accessible than it has ever been. It will open up new shipping and fishing opportunities and enable the exploitation of previously inaccessible resources. Intra-Arctic ship traffic is likely to increase considerably and with the decrease and thinning of sea ice, the long-sought shortcut between the Atlantic and the Pacific Ocean via the Northwest Passage or the Northern Sea Route will become viable by and by. Valuable fish stocks will come to be exploitable as the sea ice recedes and will not only be utilized by the Arctic states but also by long-distance fishing nations. Moreover, considerable oil and gas resources are expected to be found in the marine Arctic, and undertakings for their exploitation have already begun and are pressed by international demand for petroleum.

The addition or intensification of economic activities brings supplementary challenges for the Arctic marine environment. For many species, any potential impacts as a result of current or future shipping and other economic activity will be added to the stress they are already experiencing due to the changes occurring in their environment.[270] As has been shown, these challenges are particularly severe for the highly specialised and sensitive Arctic ecosystems.

On top of that, the marine Arctic suffers from significant pre-pollution that was partly originated outside the region and deposited in the region due to its function as the "global sink" for pollutants, and partly produced within the area itself e.g. through industrial processes or military activities. Of particular relevance are acidification, POP's, heavy metals and radioactivity.

The sensitive Arctic ecosystems thus face threats on different fronts: Firstly, they are already pre-stressed by the existing pollution issues in the region, for

[269] See the map *supra* I.1.

[270] Arctic Marine Shipping Assessment 2009 Report, *supra* note 7, p. 136.

example, the high mercury burden found in the Arctic food chain. Secondly, the consequences of climate change like shrinking and thinning sea ice fundamentally alter their habitats. Thirdly, newly commencing and expanding human activities create further hazards through pollution, noise, disturbance etc. Within the unique Arctic environment, consequences of these undertakings can be much more severe than under moderate climate. For instance, natural clean-up after oil spills is considerably slowed down under Arctic conditions and oil pollution can have serious consequences for Arctic species, as oil reduces the insulating quality of fur and feathers.

It must also be kept in mind that the marine Arctic is severely understudied, owing to the huge level of effort, expense and difficulty in obtaining an adequate data set for processes or problems in this region. The consequences of climate change on coastal mammals, birds and fish populations are therefore far from being fully comprehended.[271]

To sum it up: Impacts on the Arctic marine environment derive not only from climate change, but from the interplay of all other changes that occur, including intensified human activities, which will add to the hazards resulting from existing pre-pollution.

The next chapter will examine the governance framework for the Arctic marine environment in order to analyse how well prepared it is to meet the conservation challenges posed by the unprecedented changes.

[271] Macko, *supra* note 91, at 108.

Chapter 3
International Governance of the Arctic Marine Environment

I Outline of the Third Chapter

The previous chapter showed that the Arctic Region is subject to massive transformations, triggered by climate change that affects the region with an intensity not experienced in any other part of the world. The resulting changes arguably represent the greatest challenge for the legal regime governing the Arctic marine environment.

The objective of this chapter is to examine the adequacy of the current international governance[1] regime for conservation and management of the Arctic marine environment considering current and future effects of climate change on the area outlined above. As this research focuses on the international governance regime, the national regimes of the Arctic states are not part of the examination. Furthermore, the focus is placed on the governance of human activities occurring within the marine Arctic. Therefore, governance of external flows (in particular climate change and long-range trans-boundary pollutants) is not included in the analysis.

Whereas the third section of this chapter will focus on Arctic cooperation and Arctic institutions and the respective gaps and weaknesses with regard to the conservation of the marine environment, the fourth section concentrates on the applicable international legal regime and the fifth section aims to outline some of

[1] Governance is a "general and overarching term that is used to describe methods and institutions which guide human behaviour toward certain goals", Lawrence Juda and Timothy Hennessey, "Governance profiles and the management of the uses of large marine ecosystems," *Ocean Development & International Law* 32, no. 1 (2001), 43–69, at 44; environmental governance means the "formal and informal arrangements, institutions, and mores which determine how resources or an environment are utilized; how problems and opportunities are evaluated and analyzed; what behaviour is deemed acceptable or forbidden; and what rules and sanctions are applied to affect the pattern of resource and environment use", Juda, "Considerations in developing a functional approach to the governance of large marine ecosystems," *Ocean Development & International Law* 30, no. 2 (1999), at 90 *et seq*. The present assessment therefore includes not only the applicable binding international treaties but also relevant 'soft law'.

L. Weidemann, *International Governance of the Arctic Marine Environment*, Hamburg Studies on Maritime Affairs 27, DOI 10.1007/978-3-319-04471-2_3,

the prevailing deficits of international marine environmental governance using the Arctic as an example. The main focus will be put on the legal regime governing high seas, as these parts of the marine Arctic will be the most likely point of access and exploitation by non-Arctic states as soon as they become ice-free and thus accessible. Furthermore, it is presumed that the gaps and weaknesses of the current high seas regime will be magnified in the marine Arctic, where multiple stressors are threatening the fragile environment.

The fifth section of this chapter furthermore covers in its final part the legal regime governing high seas fisheries in the Arctic. As has been pointed out, although there are still gaps in scientific knowledge, it is likely that valuable Arctic fish stocks such as herring and cod will move about northward into the high seas—and with them the fishing fleets not only of the Arctic States but also of long-distance shipping nations.[2]

II The Regional Regime: Background

Prior to the Second World War only the northern indigenous populations were able to live in the Arctic Region. As a result, the area was widely ignored by the rest of the world. By the end of the Second World War, technological developments allowed for southerners to start entering the region. Yet, the Cold War prevented the development of an international cooperative regime.[3]

Recent events are refocusing the world's attention on the Arctic: The consequences of climate change in combination with increased demand for resources make the Arctic an increasingly important section of the world. As the ice recedes and the price of oil and gas rises, both Arctic and non-Arctic States are examining how the Arctic region can be used to advantage. This has seen the coastal states in particular staking out their claims, and many of the Arctic States also rebuilding their military capacities in the region.[4]

To ensure the protection of the Arctic's natural and living resources, management of the new opportunities for development must be coordinated by the Arctic states. Especially the anticipated new and expanded opportunities for shipping, oil and gas development, and commercial fishing will probably create management challenges due to their consequences for the environment.[5]

There is no single, comprehensive treaty for Arctic environmental protection between the eight Arctic states. Rather, marine environmental concerns in the

[2] Rob Huebert and Brooks B. Yeager, "A New Sea: The Need for a Regional Agreement on Management and Conservation of the Arctic Marine Environment," (January 2008), at 8.

[3] Rob Huebert, "Cooperation or Conflict in the Arctic?," in *Changes in the Arctic environment and the law of the sea*, ed. Myron H. Nordquist, John N. Moore and Tomas H. Heidar, Center for Oceans Law and Policy (Leiden: Martinus Nijhoff Publishers, 2010), 27–59, at 27.

[4] *Ibid*., at 29.

[5] Huebert and Yeager, *supra* note 2, p. 3.

region are dealt with by a piecemeal regime. As much of the Arctic falls within the scope of national sovereignty of the Arctic nations, national legislation plays a predominant role. Additionally, there are a number of bi- and multi-lateral treaties and agreements concerning individual sectors of the marine environment and/or specific spatial sections. On top of that, there are various regional, sub-regional, intergovernmental and interparliamentary cooperative bodies in the Arctic that deal with environmental issues. These layers of regulation mean that the "regulatory picture [concerning the Arctic] is a diffuse one".[6]

The third section of this chapter examines the regional regime for environmental governance that was established between the Arctic States and its state of readiness to successfully conserve and manage the region in light of the upcoming changes.

III The Regional Soft-Law Regime: Arctic Cooperation

1 Arctic Environmental Protection Strategy (AEPS)

Cooperation between Arctic states has a fairly short history.[7] Originally, the Arctic was considered as a region on the periphery of the world with little significance in world affairs. In addition, as sovereignty over nearly all land in the area was established and sovereignty over the waters up to the north pole were not claimed seriously by any nation because they were ice-covered for most of the year, no disputes about contradicting claims arose that might have evoked negotiations between the Arctic states.[8]

Later, the Arctic converted into a theatre of the Cold War, a setting most unfavourable for cooperation.[9] It was not until the end of this war that an attempt

[6] Davor Vidas, Protecting the polar marine environment: interplay of regulatory frameworks, in: *id*., ed., *Protecting the polar marine environment*: *Law and policy for pollution prevention* (New York: Cambridge University Press, 2000), 3–16, p. 14.

[7] Hardly any of the cooperative organisations in the Arctic region existed at the beginning of the 1990s, see Richard Langlais, "Arctic co-operation organisations: a status report: for the Standing Committee of Parliamentarians of the Arctic Region," (Rovaniemi 2000), p. 4; however, there were multi-lateral treaties among the Arctic nations as early as 1911 (North Pacific Sealing Convention), as well as in 1920 (Treaty of Spitsbergen) and 1973 (Agreement on the Conservation of Polar Bears), see Young, "The Structure of Arctic Cooperation: Solving Problems/Seizing Opportunities", p. 5.

[8] See Donald Rothwell, *The polar regions and the development of international law*, 1. publ., Cambridge studies in international and comparative law: New series; 3 (Cambridge: Cambridge University Press, 1996), p. 221 *et seq*.

[9] See Willy Østreng, "The post-Cold War Arctic: Challenges and transition during the 1990s," in *Arctic Development and Environmental Challenges*: *Information needs for decision-making and international co-operation*. Ringkjøbing/Gentofte: Scandinavian Seminar College, distributed by Erling Olsens Forlag, 1997; Papers from a Nordic Policy Seminar, Arendal, Norway, September 8–10, 1996, 33–49, at 33; Rothwell, *supra* note 8, p. 224.

for more cooperation was made. A starting point was the speech of the former Soviet General Secretary Mikhail Gorbachev in Murmansk on 1 October 1987.[10] In the course of *perestroika*, Gorbachev suggested the establishment of a nuclear-free zone in the North and encouraged greater cooperation among the Arctic states.[11]

The trigger for the realisation of closer Arctic cooperation was the common concern for the unique and fragile polar environment.[12] Recognising that most environmental problems do not respect national borders but are trans-boundary, the Finish ministers of Foreign Affairs and Environment in 1989 started an initiative aimed at the protection of the Arctic environment through intergovernmental cooperation. On invitation of the Finish government, officials from the eight Arctic countries met in Rovaniemi, Finland, in September 1989 to discuss cooperative measures to protect the Arctic environment.[13] It was the first circumpolar meeting on such a level to address regional problems and challenges and the beginning of the so-called *Rovaniemi Process*. This lead to numerous technical and scientific reports and finally resulted in the adoption of the 'Arctic Environmental Protection Strategy' (AEPS) in 1991.[14] The "joint Action Plan" of the AEPS included cooperation in scientific research and the sharing of data on sources, pathways, sinks and effects of pollution, evaluation of potential environmental effects of development activities, and the "[f]ull implementation and consideration of further measures to control pollutants and reduce their adverse effect on the Arctic environment".[15]

The five objectives laid down in the AEPS were: to protect the Arctic ecosystem including humans; to provide for the protection, enhancement and restoration of environmental quality and the sustainable utilisation of natural resources; to recognise and seek to accommodate the traditional and cultural needs, values and practices of the indigenous peoples related to the protection of the Arctic environment; to review regularly the state of the Arctic environment; and to identify, reduce, and, as a final goal, eliminate pollution.

To meet this ambitious target, as previously mentioned, six pollution problems in the Arctic region were identified as requiring priority actions: POPs, Oil

[10] See *ibid*., p. 229.

[11] Mikhail Gorbachev, The Speech in Murmansk at the ceremonial meeting on the occasion of the presentation of the Order of Lenin and the Gold Star Medal to the city of Murmansk: October 1, 1987 (Moscow: Novosti Press Agency, 1987), p. 730, reprinted on http://www.barentsinfo.fi/docs/Gorbachev_speech.pdf, last visited 26 March 2012.

[12] See Bernt Bull, "Arctic development and environmental challenges: Information needs for decision-making and international co-operation," in *Arctic Development and Environmental Challenges*, *supra* note 9, 25–31, at 28.

[13] Arctic Environmental Protection Strategy, Declaration on the Protection of Arctic Environment, Rovaniemi, 14 June 1991.

[14] Geir Hønneland and Olav S. Stokke, "Introduction," in *International cooperation and arctic governance*: *Regime effectiveness and northern region building*, ed. Olav Schram Stokke and Geir Hønneland, (London: Routledge, 2007), pp. 1–12, at 3.

[15] Arctic Environmental Protection Strategy, *supra* note 13, p. 2.

Pollution, Heavy Metals, Noise, Radioactivity and Acidification.[16] On each of these environmental problem, a State of the Environment Report was issued and a brief description of each issue was included in the AEPS.[17] Furthermore, the existing and proposed international and bilateral agreements concerning the Arctic environment at that time were reviewed.[18] Subsequently, action plans to respond to each of the identified pollution concerns were outlined.[19]

The AEPS also provided for Working Groups specialised in certain fields of pollution to be established. The AEPS laid the foundation for the Arctic Monitoring and Assessment Program (AMAP),[20] Protection of the Arctic Marine Environment (PAME),[21] Emergency Prevention, Preparedness and Response (EPPR),[22] and Conservation of Arctic Flora and Fauna (CAFF)[23] Working Groups.

Moreover, each member country was obligated to create a national agency for coordination of the cooperation laid down in the AEPS.[24] The Inuit Circumpolar Conference (ICC), the Nordic Saami Council and the former Soviet Association of Small Peoples of the North were invited as observers. According to the AEPS, other observers could be invited subject to their involvement in and contribution to Arctic environmental questions.[25] The eight Arctic countries also agreed to hold regular Meetings on the Arctic Environment intended to identify and coordinate actions to implement and further develop the AEPS; to initiate cooperation in new fields relevant to the environmental protection of the Arctic; to make necessary recommendations in order to protect the Arctic environment; to improve existing environmental regimes relevant to the Arctic; and to assess and report on progress on actions agreed upon.[26]

The next meeting took place 2 years later in Nuuk, Greenland, and resulted in the signing of the *Nuuk Declaration* on 16 September 1993.[27] At this meeting, the structure of AMAP was changed from a Task Force to a Working Group and a new Task Force on sustainable development was established.[28] Additionally, it recognised the "Senior Arctic Affairs Officials" (SAAO) appointed by each member state to guide and monitor AEPS activities, and the Ministers requested the SAAO to hold consultative meetings at least once a year.[29] Furthermore, the

[16] *Ibid*., p. 2.
[17] *Ibid*., p. 12 *et seqq*.
[18] *Ibid*., p. 20 *et seqq*.
[19] *Ibid*., p. 25 et seqq.
[20] *Ibid*., p. 30 et seqq.
[21] *Ibid*., p. 33 et seqq.
[22] *Ibid*, p. 35 et seqq.
[23] *Ibid*, p. 38 et seqq.
[24] *Ibid*., p. 40 et seqq.
[25] *Ibid*., p. 42.
[26] Arctic Environmental Protection Strategy, *supra* note 13, p. 42.
[27] The Nuuk Declaration, Nuuk, 16 September 1993.
[28] *Ibid*.
[29] Report of the Nuuk Meeting, 1993.

Government of Denmark, in cooperation with the Greenland Home Rule Government, offered to establish a Secretariat for an AEPS program that should address all issues related to the participation of indigenous people,[30] which finally became the Arctic Council's Indigenous Peoples' Secretariat.[31] Furthermore, the AMAP status report "Update on Issues of Concern to the Arctic Environment" was accepted, in which depletion of the ozone layer and climate change were identified as new areas of concern.[32]

The Ministerial Meeting in Nuuk was obviously influenced by the U.N. Conference on Environment and Development (UNCED) that was held in Rio de Janeiro in June 1992. The *Nuuk Declaration* explicitly recognises the "importance of applying the results of the [UNCED] to the Arctic region" and welcomes the "efforts of the eight Arctic countries to implement, through the [AEPS], relevant provisions of the Rio Declaration, Agenda 21 and the Forest Principles."[33]

The second Ministerial Meeting was hosted by the Canadians and led to the adoption of the *Inuvik Declaration* on 21 March 1996 in Inuvik, Canada. At that time, plans for the establishment of an Arctic council that had evolved out of the AEPS were already taking shape.[34] The SAAOs were assigned the task of developing an initial work plan for the Arctic Council's sustainable development work with the assistance of the Permanent Participants.[35]

In the declaration, support for "international agreements that are relevant and apply to Arctic regions" was expressed again, as well as support for the "important contributions being made by the AEPS countries in the promotion and implementation of these agreements".[36] The work accomplished by the AEPS in general and the Working Groups in particular were reviewed and the Task Force on Sustainable Development and Utilization (SDU) was converted into a Working Group. Lastly, the priorities for each Working Group were noted and specified.[37]

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[30] *Ibid*.

[31] Timo Koivurova and David VanderZwaag, "The Arctic Council at 10 years: Retrospect and prospects," *University of British Columbia law review* 40, no. 1 (2007), 121–195, at 127.

[32] Report of the Nuuk Meeting, para. 2.

[33] The Nuuk Declaration, Nuuk, *supra* note 27, preamble; expressly cited principle 2 and principle 22 of the Rio Declaration on the right to exploit own resources and the responsibility for activities within a nation's jurisdiction and on the importance of indigenous people for environmental management and development, *ibid*; the Ministers also articulated their support of the early ratification of the U.N. Conventions on Biological Diversity and Climate Change, *ibid*., para. 10; Likewise, support for the implementation of the provisions of the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) was expressed with the objective of an "internationally transparent domestic process for the environmental impact assessment", *ibid*., para. 8.

[34] See Inuvik Declaration, Inuvik, 21 March 1996, cipher 15: "We are fully committed to the earliest possible establishment of the Arctic Council."

[35] *Ibid*., cipher 6.

[36] *Ibid*., preamble.

[37] Inuvik Declaration, Inuvik, 21 March 1996, cipher 6.

2 Arctic Council

After several years of circumpolar cooperation, in 1996, negotiations promoted by Canada in particular led to the "Declaration on the Establishment of the Arctic Council",[38] which established the integration of the AEPS into the Arctic Council that was carried out at the last AEPS ministerial meeting in Alta, Norway, in 1997.[39] However, the Arctic Council is not identical with the AEPS since it extended the terms of reference of the same. While the AEPS had focused on the protection of the Arctic environment, the Arctic Council's mandate was broadened to include "common Arctic issues, in particular issues of sustainable development and environmental protection".[40]

The Arctic Council is a high-level intergovernmental forum[41] for circumpolar Arctic co-operation and not a formal international organisation pursuant to international law.[42] It has no legal personality and cannot generate legally binding obligations, but only issue recommendatory declarations.

It is made up of the Member States[43] (represented by Senior Arctic Officials, SAOs), the Permanent Participant Indigenous Peoples' Organisations (Permanent Participants[44]),

[38] Declaration on the Establishment of the Arctic Council, Ottawa, 19 September 1996.

[39] See The Nuuk Declaration, Nuuk, *supra* note 27, cypher 2.

[40] See Lars-Erik Liljelund, "International cooperation and action for the Arctic environment and development: An overview of governmental efforts," in *Arctic Development and Environmental Challenges* (*supra* note 9), 61–64, at 63; Koivurova and VanderZwaag, *supra* note 31, at 129; As expressed in its founding document the Arctic Council was created to:

"a. provide a means for promoting cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic indigenous communities and other Arctic inhabitants on common arctic issues*, in particular issues of sustainable development and environmental protection in the Arctic.

b. oversee and coordinate the programs established under the AEPS on the Arctic Monitoring and Assessment Program (AMAP); conservation of Arctic Flora and Fauna (CAFF); Protection of the Arctic Marine Environment (PAME); and Emergency Preparedness and Response (EPPR).

c. adopt terms of reference for and oversee and coordinate a sustainable development program.

d. disseminate information, encourage education and promote interest in Arctic- related issues."

The asterisk (*) after "issues" in point "a" refers to a significant *caveat*: "The Arctic Council should not deal with matters related to military security."

[41] See Declaration on the Establishment of the Arctic Council, *supra* note 38.

[42] See Vienna Convention on the Law of Treaties between States and International Organizations or Between International Organizations, signed 21 March 1986, not yet in force, 25 ILM 543 (1986); the establishment of the Arctic Council as a discussion forum as opposed to an international organisation with legal personality was a prerequisite demanded by the United States, see Evan T. Bloom, "Establishment of the Arctic Council," *The American Journal of International Law* 93, no. 3 (1999), at 721.

[43] These are the eight Arctic nations that also formed the AEPS.

[44] The category of Permanent Participants was created through the Ottawa Declaration. This special membership status is open to Arctic organisations of indigenous peoples that represent either a single indigenous people resident in more than one arctic State; or more than one Arctic indigenous people resident in a single Arctic State. These have the right to participate in all Council Meetings and need to

Observers,[45] Ad Hoc Observers,[46] the Chair (that rotates every 2 years),[47] the Arctic Council Secretariat and the Working Groups.

The SAOs of the member countries meet several times a year to co-ordinate the Arctic Council's work; ministerial meetings are held every second year.[48] The ministerial portfolios involve the equivalent of each country's ministries for the environment and for foreign affairs.[49] All decisions of the Arctic Council and its subsidiary bodies, including the decisions to be taken by SAOs, have to be taken by a consensus of all eight Arctic States.[50]

The principal work of the Arctic Council has always been carried out by the working groups.[51] Apart from the above-mentioned Working Groups AMAP, PAME, CAFF and EPPR, these are the Arctic Contaminants Action Programme (ACAP) and the Sustainable Development Working Group (SDWG). The

be fully consulted before decision-making, see Declaration on the Establishment of the Arctic Council, *supra* note 38, p. 2. Although they have no formal decision-making power, permanent participants are in a position to exert "much practical influence on the decision-making of the Council", Koivurova and VanderZwaag, *supra* note 31, at 127. Permanent Participants are currently the Aleut International Association (AIA), the Arctic Athabaskan Council (AAC), the Gwich'in Council International (GCI), the Inuit Circumpolar Conference (ICC), the Russian Association of Indigenous Peoples of the North (RAIPON) and the Saami Council.

[45] Observer status can be obtained by non-arctic states, global or regional inter-governmental and inter-parliamentary organisations, and non-governmental organisations, see Declaration on the Establishment of the Arctic Council, *supra* note 38, p. 2. Non-Arctic states with a permanent observer status comprise France, Germany, Poland, Spain, the Netherlands and the United Kingdom. Inter-governmental and inter-parliamentary organisations with observer status are the Arctic Circumpolar Route, the Association of World Reindeer Herders (AWRH), the Circumpolar Conservation Union (CCU), the International Arctic Science Committee (IASC), the International Arctic Social Sciences Association (IASSA), the International Union for Circumpolar Health (IUCH), the World Conservation Union (IUCN), the International Work Group for Indigenous Affairs (IWGIA), the North Atlantic Marine Mammal Commission (NAMMCO), the Nordic Council of Ministers (NCM), the Nordic Environment Finance Corporation (NEFCO), the Northern Forum, the Standing Committee of Parliamentarians of the Arctic Region (SCPAR), the University of the Arctic (UArctic), the United Nations Development Programme (UNDP) and UNEP-GRID/Arendal. Non-governmental observer organisations are the International Federation of Red Cross and Red Crescent Societies (IFRC) and the World Wide Fund for Nature (WWF), see homepage of the Arctic Council, available at: http://www.arctic-council.org.

[46] Ad hoc observers are granted observer status for a specific meeting, see Arctic Council, Rules of Procedure, as adopted by the Arctic Council at the First Arctic Council Ministerial Meeting, Iqaluit, Canada, September 17–18, 1998, no. 37.

[47] Arctic Council, Rules of Procedure, *supra* note 46, no. 17.

[48] *Ibid*., no. 15.

[49] At the 2011 Ministerial Meeting in Greenland, Hillary Clinton was the first US Secretary of State to participate in an Arctic Council meeting, see e.g. Alex Spillius, "Arctic Circle meets to discuss mineral exploration," *The Telegraph*, May 12, 2011. This demonstrates that the Arctic Region has risen on the US American political agenda, see Hillary Rodham Clinton, interview by Tom Clark, March 29, 2010.

[50] Arctic Council, Rules of Procedure, *supra* note 46, no. 7.

[51] Koivurova and VanderZwaag, *supra* note 31, at 137.

following section shall provide some basic information about the activities of the working groups.[52]

The primary role of AMAP is that of an advisor to the governments of the Arctic states with regard to environmental hazards resulting from pollution, and associated issues.[53] The body is responsible for "measuring the levels, and assessing the effects of anthropogenic pollutants in all compartments of the Arctic environment, including humans; documenting pollution trends and pollutant sources/pathways; examining the impact of pollution on Arctic flora and fauna, especially those used by indigenous people; reporting on the state of the Arctic environment; and giving advice to Ministers on priority actions needed to improve the condition of the Arctic."[54]

AMAP has carried out a series of scientific assessments of the Arctic environment. Firstly, it has completed three State of the Arctic Environment assessments relating to pollution issues.[55] Secondly, it was responsible for the ACIA mentioned above from 2004.[56] In April 2009, AMAP published an "Update on Selected Climate Issues of Concern" as an update of some of the work undertaken as follow-up of the ACIA.[57]

The AMAP assessments are completed with the help of a great number of scientists, indigenous peoples' representatives, as well as representatives of the Arctic states and AMAP observing countries and organisations. These assessments laid the foundation for the development of ACAP.[58]

ACAP was originally a steering committee called the Arctic Council Action Plan to Eliminate Pollution in the Arctic established to limit and reduce emissions of pollutants into the environment and promote international cooperation.[59] At the Fifth Arctic Council Ministerial Meeting in Salekhard, Russia, ACAP was approved as a working group and its name was changed to the "Arctic

[52] For a list of activities and programs of the Arctic Council working groups consult the website of the Arctic Council, available at: www.arctic-council.org.

[53] It was designed to "provide reliable and sufficient information on the status of, and threats to, the Arctic environment, and to provide scientific advice on actions to be taken in order to support Arctic governments in their efforts to take remedial and preventive actions relating to contaminants.", information retrieved from the AMAP website: www.amap.no, last visited 26 March 2012.

[54] Information retrieved from the AMAP website, *ibid*.

[55] The first of these was published in 1997 (Arctic Pollution Issues: A State of the Arctic Environment Report, Arctic Monitoring and Assessment Programme, Oslo), the second in 2002 (Arctic Pollution 2002, Arctic Monitoring and Assessment Programme, Oslo) and the third in 2009 (Arctic Pollution 2009, Arctic Monitoring and Assessment Programme, Oslo).

[56] Susan J. Hassol, *Impacts of a warming Arctic*: *Arctic Climate Impact Assessment* (Cambridge, New York: Cambridge University Press, 2004), p. 8, available at: http://amap.no/workdocs/index.cfm?dirsub=%2FACIA%2Foverview/http://amap.no/acia//http://www.acia.uaf.edu/, last visited 17 December 2011.

[57] AMAP 2009, Update on Selected Climate Issues of Concern, Arctic Monitoring and Assessment Programme, Oslo 2009, p. iii.

[58] See AMAP Homepage, About AMAP, Introduction, available at: http://www.amap.no/aboutamap/introduction.htm, last visited 30 March 2012.

[59] See Arctic Council, Arctic Council Action Plan to Eliminate Pollution of the Arctic (ACAP), Barrow, October 13, 2000, p. 1.

Contaminants Action Program".[60] It is intended to act as a strengthening and supporting mechanism to encourage national actions "to reduce releases of contaminants locally and regionally and to promote international cooperation".[61]

The programme for the Conservation of Arctic Flora and Fauna (CAFF) was established as a "distinct forum for scientists, indigenous peoples and conservation managers engaged in Arctic flora, fauna and habitat related activities to exchange data and information on issues such as shared species and habitats and to collaborate as appropriate for more effective research, sustainable utilisation and conservation." Its objectives are listed as the monitoring of Arctic biodiversity; conservation of Arctic species and their habitats; considering the establishment of protected areas, conservation of nature outside protected areas; and integration of conservation objectives and measures for economic sectors of the society.[62]

CAFF's work is guided by four main principles: The involvement of indigenous and local people and use of traditional knowledge; the use of broad, ecosystem-based approach to conservation and management; cooperation with other conservation initiatives; and communication of CAFF program activities.[63]

The mandate of the EPPR Working Group is to provide a framework for cooperation in the field of prevention, preparedness and response to environmental emergencies in the Arctic,[64] while it is no response agency.[65] Its members exchange information on best practices and conduct projects, e.g. development of risk assessment methodologies. In 2004, Arctic Ministers decided to expand EPPR's mandate to include natural disasters.[66]

The SDWG was established to promote sustainable development in the Arctic, especially with regard to health issues, sustainable economic activities, education and cultural heritage, children and youth, management of natural resources, and infrastructure development.[67]

PAME is mainly responsible for pollution prevention and control measures regarding the Arctic marine environment, aiming at its protection both from land and sea-based

[60] Salekhard Declaration, on the occasion of the tenth Anniversary of the Arctic Council, the Fifth AC Ministerial Meeting, Salekhard, 26 October 2006.

[61] *Ibid*.

[62] Information retrieved from the CAFF website, available at: http://caff.arcticportal.org/index.php?option=com_content&view=category&layout=blog&id=4&Itemid=18, last visited 21 September 2009.

[63] Strategic Plan for the Conservation of Arctic Biological Diversity, September 1998, available at: http://arcticportal.org/uploads/RX/zN/RXzNc4KU8QKfhN_KDw_oQQ/The-StrategicPlanforTheConservofArcticBiolDiv.pdf, last visited 21 September 2009.

[64] See Arctic Environmental Protection Strategy, *supra* note 13, p. 36.

[65] Arctic Marine Shipping Assessment 2009 Report, Arctic Council, April 2009, available at: http://www.pame.is/images/stories/PDF_Files/AMSA_2009_Report_2nd_print.pdf, last visited 26 March 2012, p. 13.

[66] *Ibid*.

[67] See Arctic Council, Sustainable Development Framework Document: Barrow, Alaska, October 13, 2000.

activities via "coordinated action programmes and guidelines complementing existing legal arrangements".[68] Its most recent completed tasks include the Arctic Offshore Oil and Gas Guidelines, which were published in April 2009[69] and the AMSA of 2009.[70]

Generally speaking, through its Working Groups, the Arctic Council has conducted multitudinous scientific assessments relating to the Arctic environment and has issued several technical guidelines and manuals of good practice. In some cases, the output of the Working Groups also results in policy recommendations proclaimed in the Council's non-binding declarations.[71]

3 Evaluation of the AEPS and Arctic Council

a) Merits

The AEPS and the Arctic Council have served the matter of environmental protection in the Arctic in various ways.

First of all, their creation drew the Arctic States' attention to the circumpolar region that had—as previously discussed—been long perceived as a peripheral issue and thus been widely neglected by most nations.[72] The AEPS and its successor promoted the perception of the Arctic Region as an entity that shares many unique environmental properties[73] and at the same time raised awareness of common circumpolar concerns. The second major influence of the AEPS and Arctic Council was to put trans-boundary environmental problems on the agenda of the Arctic States.

However, the major achievement of both the AEPS and the Arctic Council has been the trans-boundary monitoring and documentation of threats concerning Arctic ecosystems.[74] The Arctic Council is specialised in environmental assessment

[68] See PAME International Secretariat, Protection of the Arctic Marine Environment, Working Group of the Arctic Council 2011–2013, available at: http://www.pame.is/images/phocadownload/pame_einblodungur.pdf, last visited 30 March 2012.

[69] Arctic Council Protection of the Arctic Marine Environment Working Group, Arctic Offshore Oil and Gas Guidelines, 29 April 2009, available at: http://arcticportal.org/uploads/F7/aC/F7aCQhSrOfC4y9XIaHWZpw/Arctic-Guidelines-2009-13th-Mar2009.pdf, last visited 26 March 2012.

[70] Arctic Marine Shipping Assessment 2009 Report, *supra* note 65.

[71] See Timo Koivurova, Erik J. Molenaar and David L. VanderZwaag, "Canada, the EU, and Arctic Ocean Governance: A Tangled and Shifting Seascape and Future Directions," *Journal of Transnational Law & Policy* 18 (2008–2009) 247–288, at 263.

[72] See Carina Keskitalo, "International Region-Building: Development of the Arctic as an International Region," *Cooperation and Conflict* 42, no. 2 (2007) 187–205, at 193.

[73] See Young, *supra* note 7, p. 15.

[74] Oran Young, "Whither the Arctic 2009? Further developments," *Polar Record* 45, no. 2 (2009) 179–181, at 180; *id*., "The Arctic in Play: Governance in a Time of Rapid Change," *International Journal of Marine and Coastal Law* 24 (2009) 423–442, at 437; David L. Vander Zwaag, Rob Huebert and Stacey Ferrara, "The Arctic Environmental Protection Strategy, Arctic Council and

and scientifically based decision-making is a firmly anchored principle in its Working Groups.[75] The scientific assessments these produce contribute to an enhanced understanding of the region's environment and create a better knowledge base for decision-making.[76]

The Arctic Council also deserves credit for granting a strong status to the indigenous peoples of the region that warrants their participation in all meetings and consideration of their traditional knowledge.[77]

b) Shortcomings

aa) No Regulatory Body

Without any doubt, promoting polar science, environmental monitoring and political awareness are important contributions to enhance the protection of the Arctic marine environment. However, to achieve effective conservation, scientific findings needed to be followed by a targeted policy response.[78] Conversely, the Arctic Council places priority on problem identification rather than on cooperative remedial action.[79] Ironically, the Arctic Council produced the assessments (ACIA et al.) that clearly disclosed the need for enhanced governance over economic activities in the Arctic, but is itself unable to provide for this governance[80] because it has no power to enforce decisions as binding law.[81]

The main restraints can be ascribed to the Council's legal basis: It was founded by a 'soft law' declaration as opposed to a 'hard law' treaty, and has thus no power to establish legally binding duties for the Member States.[82] Therefore, the Arctic Council's

multilateral environmental initiatives: tinkering while the Arctic marine environment totters," in *The law of the sea and polar maritime delimitation and jurisdiction*, ed. Alex G. Oude Elferink and Donald R. Rothwell, 225–48 (Hague: Nijhoff, 2001), at 240.

[75] *Ibid*., at 237.

[76] Timo Koivurova, "Limits and possibilities of the Arctic Council in a rapidly changing scene of Arctic governance," *Polar Record* 46, no. 2 (2010) 146–156, at 153.

[77] Koivurova, Molenaar and VanderZwaag, *supra* note 71, at 264.

[78] See Olav S. Stokke, Geir Hønneland and Peter J. Schei, "Pollution and conservation," in *International cooperation and arctic governance*: *Regime effectiveness and northern region building*, *supra* note 14, 78–111, at 92; Duncan French and Karen Scott, "International legal implications of climate change for the polar regions: Too much, too little, too late?," *Melbourne Journal of International Law* 10, no. 2 (2009), 631–654, at 633.

[79] See Rob Huebert, "The law of the sea and the Arctic: An unfulfilled legacy," *Ocean Yearbook* 18 (2004), 193–219, at 211 *et seq*., 218.

[80] *Ibid*.

[81] See Erika Lennon, "A Tale of Two Pole: A Comparative Look at the Legal Regimes in the Arctic and the Antarctic," *Sustainable Development and Law* 8, no. 3 (2008) 32–36, at 34.

[82] Koivurova and VanderZwaag, *supra* note 31, at 157; Timo Koivurova and Md W. Hasanat, "The Climate Policy of the Arctic Council," in *Climate governance in the Arctic*, ed. Timo Koivurova, E. C. Keskitalo and Nigel Bankes, 1. Ed., 51–75 (Dordrecht: Springer Netherland, 2009).

success in terms of effective environmental conservation and management relies mainly on the goodwill of the Arctic States,[83] which are responsible for the implementation of the Council's recommendations. States and other relevant actors are merely *encouraged* to follow the Council's recommendations. Thus they are not expected to give Arctic Council decisions preference over national policies,[84] and there is a lack of systematic review as to whether governments or others actually follow the Council's decisions.[85]

With its focus on polar science and environmental monitoring and the non-binding technical guidance these activities generate, the Arctic Council to a large extent avoids controversial issues that regulatory decisions would trigger.[86] On the other hand, the lack of a need to commit to potentially unpopular decisions means that the Council can be seen as a talking shop with no powers to prevent any individual State from pressing ahead with development in the Arctic.[87]

bb) No Structural Funding

A further limiting factor for the work of the Arctic Council is the lack of a permanent and mandatory funding mechanism. The Council does not have any resources to launch substantial programs of its own.[88] Instead, programs are funded voluntarily by the individual States. These propose projects or select working groups they want to support, and implement and pay for them.[89] For example, Norway pays for the secretariat for AMAP, Iceland for PAME, the USA and Iceland for CAFF, and Denmark covers most of the funding for the Indigenous Peoples' Secretariat in Copenhagen.[90]

The lack of legal obligations can be seen as facilitating funding in the sense that Member States of the Arctic Council can contribute funds as a political, rather than legal gesture, and terminate this funding without legal consequence.[91] On the other hand, funding relies directly on the commitment of the Member States, "whose priorities may change over time".[92] An informal rule in the Arctic Council is that the state that has taken the lead in commencing a project is also responsible for

[83] *Ibid*., at 70.

[84] Kristine Offerdal, "Oil, gas and the environment," in *International cooperation and arctic governance*: *Regime effectiveness and northern region building*, *supra* note 14, 138–63, at 142.

[85] Stokke, Hønneland and Schei, *supra* note 78, at 93.

[86] Richard Sale and Eugene Potapov, *The scramble for the Arctic*: *Ownership*, *exploitation and conflict in the far north*, 1. Frances Lincoln (London: Lincoln Limited Publishers, 2010), p. 141.

[87] *Ibid*., p. 141.

[88] Huebert and Yeager, *supra* note 2, p. 3.

[89] Sale and Potapov, *supra* note 86, p. 141.

[90] *Ibid*.

[91] *Ibid*., p. 141.

[92] Peter Stenlund, "Lessons in regional cooperation from the arctic," *Ocean & Coastal Management* 45 (2002) 835–839, at 836.

follow-up, whereas other countries may contribute to the degree that they find appropriate and to the extent that they find the project interesting and useful.[93] If a project drops from the agenda of the funding state and no other Member State is willing to take over, it may fail before being completed—as happened to the Circumpolar Protected Areas Network (CPAN) project. This is a major weakness of the *ad hoc* financing system.

Although the problem of the lack of formalised funding has been on the agenda of the Arctic Council for quite some time, there has not yet been a fundamental change to the financing mechanism. However, a Project Support Instrument (PSI) was established in 2005 to facilitate specific projects, based on the idea that interested Member States of the Arctic Council pledge contributions to the PSI.[94]

Nonetheless, the structural problem of no guaranteed permanent funding has not been resolved and there are no signs that a stable financing mechanisms will be introduced, although the Arctic Council reiterated the "need to finance circumpolar cooperation" at its last meeting in May 2011.[95]

cc) No Permanent Secretariat (Yet)

Along with the lack of a structural funding mechanism, another obstacle to the development of a continuous long-term programme of the Arctic Council has been the absence of a permanent secretariat.[96]

In the past, the location of the secretariat has rotated according to the chairmanship of the Arctic Council, which means that each chair state has the responsibility for creating a secretariat. This secretariat is responsible for the overall coordination of Council activity, including the organisation of semi-annual meetings, hosting the Council website, and distributing the various reports and documents relating to the Council's work.[97] In this regard, the priorities of the chair-state that changes every 2 years have strongly affected the work of the Arctic Council.[98]

During the Norwegian, Danish and Swedish periods holding the Chair from 2006 to 2013, an Arctic Council Secretariat was established in Tromsø, Norway. It is supposed to contribute to the coordination of work among SAOs and Working Groups and enhance efficiency of the Council's work.[99]

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[93] Offerdal, *supra* note 84, at 142.

[94] Information obtained from NEFCO's homepage, available at: http://www.nefco.org/financing/arctic_council_project_support, last visited 14 April 2010.

[95] Arctic Council, Nuuk Declaration, *supra* note 27.

[96] Huebert and Yeager, *supra* note 2, p. 3.

[97] See homepage of the Arctic Council, available at: http://www.arctic-council.org, last visited 1 August 2011.

[98] Timo Koivurova, "Governance of protected areas in the Arctic," *Utrecht Law Review* 5, no. 1 (2009) 44–60, at 47.

[99] Senior Arctic Official (SA0) Report to Ministers, Tromsø, Norway, April 2009, p. 33.

In May 2011, the Council finally decided to establish a standing secretariat in Tromsø due to operate until the beginning of the Canadian Chairmanship in 2013.[100] It is designed to "enhance the objectives of the Arctic Council through the establishment of administrative capacity and by providing continuity, institutional memory, operational efficiency, enhanced communication and outreach, exchange of information with other relevant international organisations and to support activities of the Arctic Council."[101]

However, the biannual rotation of the Chairmanship must not be forgotten. Thus it remains to be seen whether long-term goals will be followed throughout the changing chairmanships or whether the respective priorities of the individual chair state will be the primary force. Of course, a permanent location for the secretariat is an important step forward, but it would need to be followed by organisational changes leading to an independent secretariat to make a real difference.

dd) Incomplete Mandate and Sectoral Approach

Another weakness of the Arctic Council relates to its incomprehensive mandate. The Council's lack of an express mandate for the conservation and management of Arctic fisheries forms a significant gap and major flaw with respect to environmental protection.[102] So far, Member States have declined to include fisheries as an area of discussion.[103]

Furthermore, the Arctic Council falls short in applying the ecosystem-based approach. Although constantly promoting ecosystem-based management, the Council's reliance on its dedicated Working Groups for contribution on pollution, conservation, protection of the marine environment etc., hampers the overcoming of the sectoral division due to its very structure.[104] This is particularly severe as the competing uses of the opening Arctic Ocean include multiple, interactive, and cumulative stressors.[105]

[100] Arctic Council, Nuuk Declaration, *supra* note 27.

[101] Senior Arctic Officials (SAO) Report to Ministers, Nuuk, Greenland, May 2011, p. 48.

[102] See Erik J. Molenaar and Robert Corell, "Arctic Fisheries: Background Paper," (Arctic Transform, 9 February 2009), p. 5; this generated critique of the ICC, see Towards an Inuit Declaration on Arctic Sovereignty, Statement issued by Inuit Leaders at the Inuit Leaders' Summit on Arctic Sovereignty, 6–7 November 2008, available at: http://www.sikunews.com/News/International/Arctic-Sovereignty-Begins-with-Inuit-5567, last visited 8 August 2011.

[103] Commercial Fishing in the Arctic, ICC Alaska Staff, DRUM, Vol. 2, Issue 2, June 2009, p. 1.

[104] Huebert and Yeager, *supra* note 2, p. 23.

[105] L. B. Crowder, Gail Osherenko and Oran e. a. Young, "Sustainability. Resolving mismatches in U.S. ocean governance.," *Science* 313, no. 5787 (2006), 617–618, at 618.

ee) Exclusive Meetings of the Coastal States

The Arctic Council is furthermore confronted with "institutional challenges".[106] Recently, the position and significance of the Arctic Council for the Arctic Region have been challenged through the holding of exclusive meetings of the five Arctic littoral states. The first one was concluded by the widely noted "Ilulissat Declaration" signed by the foreign ministers of Canada, Denmark, Norway, the Russian Federation and the United States in May 2008.[107] In this document, the represented States recognised the impacts of climate change including new uses of the marine Arctic and the governance challenges these imply. They identified the law of the sea as an "extensive international legal framework" applicable to the region and committed to the regime. This also led to them expressing the view that no "new comprehensive international legal regime to govern the Arctic Ocean" needs to be developed.[108]

The intention behind the Ilulissat Declaration was arguably twofold: the Arctic coastal states wanted to calm the international community that was concerned about antagonistic claims to the Arctic Region following the planting of a Russian flag on the seabed underneath the North Pole.[109] Therefore, the Arctic five committed to "the orderly settlement of any possible overlapping claims".[110] Secondly, the Arctic littoral states wanted to endorse their predominant role in the region, stressing that "[b]y virtue of their sovereignty, sovereign rights and jurisdiction in large areas of the Arctic Ocean the five coastal states are in a unique position"[111] to deal with the challenges resulting from climate change-induced challenges. In combination with the rejection of proposals for a new legal regime concerning the marine Arctic, the coastal states thus also refuse the engagement of non-Arctic states in settling Arctic affairs.[112]

About 2 years after the meeting in Ilulissat, the Arctic Five met again in Chelsea, Canada, in March 2010.[113] Besides reiterating the commitment to the international legal framework applicable to the Arctic Ocean and the pledge to orderly settlement of any overlapping claims, the coastal states committed to the completion of an Arctic

[106] Timo Koivurova, "Governing Arctic Shipping: Finding a Role for the Arctic Council," in *The Yearbook of Polar Law*, ed. Gudmundur Alfredsson and Timo Koivurova, 115–38 2 (Leiden Boston: Martinus Nijhoff Publishers, 2010), at 133.

[107] The Ilulissat Declaration, Arctic Ocean Conference Ilulissat, Greenland, 27–29 May 2008, available at: http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf, last visited 26 March 2012.

[108] *Ibid.*

[109] See e.g. N.N., "Russia plants flag under N Pole," *BBC News*, August 2, 2007.

[110] Ilulissat Declaration, *supra* note 107.

[111] *Ibid.*

[112] See Brooks B. Yeager, "The Ilulissat Declaration: Background and Implications for Arctic Governance," (5 November 2008); Prepared for the Aspen Dialogue and Commission on Arctic Climate Change, p. 2.

[113] See Foreign Affairs and International Trade Canada, Arctic Ocean Foreign Ministers' Meeting, 29 March 2010, Chelsea, Quebec, http://www.international.gc.ca/polar-polaire/arctic-meeting_reunion-arctique-2010_index.aspx?view=d, last visited 2 August 2011.

Search and Rescue Agreement[114] and the development of a mandatory regime for shipping in polar waters within the IMO.[115] They also pledged to promote science in the Arctic marine area and to intensify cooperation between their scientific communities. Again, the Arctic littoral states emphasised the special position they had assumed in the region: With regard to fish stocks and their possible future commercial exploitation, they accentuated their "unique interest and role to play" in conservation and management.[116] Yet another time, the coastal states refer to the applicable international framework and thus to the rights and obligations granted to them within their Exclusive Economic Zones (EEZ) by the relevant UNCLOS provisions. Thereby, these nations reinforce the dominant role they want to play in exploitation of resources, management and conservation of the Arctic resources. They also highlight their "stewardship" role as coastal states in the region, thus possibly implying responsibility for the Arctic marine environment but also claiming some kind of supremacy over the remaining Arctic States and even more so over non-Arctic nations.

Among the three Arctic States that were excluded from the meeting in Ilulissat and the Permanent Participants who were also not invited, the course of action taken by the Arctic coastal states raised concerns.[117] Iceland in particular voiced its concern that three Members of the Arctic Council were not invited to participate in the meetings.[118] At the meeting in Chelsea, even US Foreign Minister Clinton criticised the exclusive list of participants.[119]

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[114] The respective Agreement was indeed concluded in May 2011, see Arctic Search and Rescue Agreement, available at: http://arctic-council.npolar.no/accms/export/sites/default/en/meetings/2011-nuuk-ministerial/docs/Arctic_SAR_Agreement_EN_FINAL_for_signature_21-Apr-2011.pdf, last visited 26 March 2012.

[115] Foreign Affairs and International Trade Canada, Arctic Ocean Foreign Ministers' Meeting, 29 March 2010, Chelsea, Quebec, Chair's Summary, http://www.international.gc.ca/polar-polaire/arctic-meeting_reunion-arctique-2010_summary_sommaire.aspx?lang=en&view=d, last visited 2 August 2011.

[116] *Ibid.*

[117] See Arctic Council, Meeting of Senior Arctic Officials, Final Report, 28–29 November 2007, Narvik, Norway.

[118] See Arctic Council, Meeting of Senior Arctic Officials, *supra* note 117, p. 20: "Iceland expressed concerns that separate meetings of the five Arctic states, Denmark, Norway, US, Russia and Canada, on Arctic issues without the participation of the members of the Arctic Council, Sweden, Finland and Iceland, could create a new process that competes with the objectives of the Arctic Council. If issues of broad concern to all of the Arctic Council Member States, including the effect of climate change, shipping in the Arctic, etc. are to be discussed, Iceland requested that Denmark invite the other Arctic Council states to participate in the ministerial meeting. Permanent participants also requested to participate in the meeting. Denmark responded that the capacity of the venue may be an issue."; The 8th Conference of Parliamentarians of the Arctic Region Fairbanks, United States, 12–14 August 2008, Conference Report, para. 39, available at: http://www.arcticparl.org/files/files%20from%208th%20conference/Conference_Report_Fairbanks_final.pdf, last visited 3 August 2011; N.N., "Iceland upset by Arctic summit snub," *cbcnews*, February 16, 2010, http://www.cbc.ca/news/canada/north/story/2010/02/16/north-arctic-five.html.

[119] Mary B. Sheridan, "Clinton rebukes Canada at Arctic meeting," *Washington Post*, March 30, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/03/29/AR2010032903577.html.

Indeed, the meetings of the Arctic coastal states can be regarded as questioning the significance of the Arctic Council as the main forum for discussion of Arctic issues.[120] Although attending ministers have been quick to stress the relevance of the Arctic Council and its role as the main scene for circumpolar discussions and denied that the meeting undermined the Council,[121] at the same time they justified the exclusive meeting of the Arctic Five with their special status as coastal states.[122] On this ground they shared the view that the format of an Arctic G5 should be maintained in the future.[123]

This means the meetings among the Arctic coastal states will remain as a parallel forum rivalling the Arctic Council, thus tentatively giving the impression that there is a two-class cooperation between Arctic States: one among the "inner circle" of the coastal states and one in the broader forum of the Council including the remaining three states. Exclusive cooperation amongst five of the eight Arctic States suggests that important issues concerning management and conservation of Arctic resources or regulation of Arctic shipping are decided upon outside the Arctic Council, thus undermining its importance and authority. In addition, the creation of a parallel discussion forum weakens the achievement of participation and full consultation of the Arctic indigenous peoples concerning all Arctic matters.

At the meeting in Chelsea it was argued that the G5 were no competition to the Arctic Council since discussions focused on the responsibilities of the coastal states.[124] The topics discussed during the meetings among the coastal states—e.g. navigation or fishing—do in fact bring about special rights and obligations for the coastal states. Yet other states retain certain rights granted by the international law of the sea. Therefore, the remaining arctic nations as well as non-Arctic states have interests that should be considered when discussing these issues. Hence, the meetings should have taken place within the broader forum of the Arctic Council.

ff) Limited Participation

The aforementioned complex of problems leads to another issue the Arctic Council is facing, namely the status it accords to other interested states. As the sea ice recedes and resources as well as shipping routes become more accessible, a growing number of non-Arctic states are showing their interest in the Arctic Region and

[120] See Koivurova, *supra* note 106, at 134.

[121] See N.N., "Hillary Clinton criticises Canada over Arctic talks," *BBC News*, March 30, 2010.

[122] See Juliet O'Neill and Randy Boswell, "Clinton blasts Canada for exclusive Arctic talks," *Canwest News Service*, March 29, 2010, http://www.globalnews.ca/aboutus/clinton+blasts+canada+exclusive+arctic+talks/2740420/story.html.

[123] Atle Staalesen, "Formalizing the Arctic G5," *BarentsObserver*, March 30, 2010.

[124] N.N., "Cannon defends Arctic summit's guest list," *cbcnews*, February 17, 2010.; by the same token, ministers argued at the meeting in Ilulissat, N.N., "Finland, Sweden, Iceland left out," *SIKU news*, May 21, 2008.

seeking to become involved in the Arctic Council. China,[125] South Korea, Japan, Italy and the European Commission have applied for permanent observer status, but have thus far only been accepted as "ad hoc" observers.[126] Recently, India has joined the list of aspirants for permanent observer status.[127] Permanent observers have no voting rights, but they may contribute to the Arctic Council's work in the Working Groups.

At the ministerial meeting in Tromsø in 2009 the pending applications for permanent observer status were not granted.[128] Prior to the meeting, the EU had caused some irritation especially with Canada and indigenous peoples with its decision to ban the import of seal products.[129]

At the ministerial meeting in Nuuk in May 2011, there was still no decision on the applications for observer status, but the role of observers was redefined and criteria for admittance of new observers were established.[130] These need to share and support the Arctic Council's objectives, and show their capacity and willingness to further its work. Also, they have to accept indigenous peoples' interests and demonstrate their political will and financial ability to contribute to their work. Applicants for permanent observer status moreover, have to recognise the Arctic States sovereignty and sovereign rights. Notably, they should also acknowledge "the existence of an extensive legal framework [that] applies to the Arctic Ocean [...] and that this framework provides a solid foundation for responsible management of this ocean".[131] This can be understood as yet another rejection of the idea of a legally binding treaty dedicated to the Arctic and the requirement that observers to the Arctic Council support this view. If the Arctic States consider the aspirants comply with the criteria, the observer status may be granted at their next meeting in 2 years.

How to deal with the increasing list of players that want to participate in Arctic cooperation is a great challenge for the Arctic Council.[132] Some indigenous peoples

[125] For China's ambitions with regard to the Arctic see Linda Jakobson, "China prepares for an ice-free Arctic," *SIPRI Insights on Peace and Security* 2010/2 (March 2010).

[126] See Meeting of Senior Arctic Officials, Final Report, 28–29 April 2010, Ilulissat, p. 2.

[127] N.N., "India might become an observer of Arctic Council: US," *Press Trust of India/Business Standard*, May 10, 2011, http://www.business-standard.com/india/news/india-might-become-an-observerarctic-council-us/134569/on (accessed August 11, 2011).

[128] Ministers declared "to continue discussing the role of observers in the Arctic Council"(Tromsø Declaration on the occasion of the Sixth Ministerial Meeting of the Arctic Council, 29 April 2009, Tromsø, Norway), which means they did not decide over the applications and thus postponed the verdict to the next meeting two years later.

[129] Leigh Phillips, Arctic Council rejects EU's observer application (2009), euobserver, available at: http://euobserver.com/885/28043, last visited 26 March 2012.

[130] Senior Arctic Officials (SAO) Report to Ministers, Nuuk, Greenland, May 2011, p. 50 *et seq*.; Nuuk Declaration on the occasion of the Seventh Ministerial Meeting of the Arctic Council, 12 May 2011, Nuuk, Greenland, p. 2.

[131] Senior Arctic Officials (SAO) Report to Ministers, Nuuk, Greenland, May 2011, *loc. cit. supra* note 130.

[132] Norway's foreign ministers Jonas Gahr Stoere said lately: "The Arctic Council's biggest challenge in the past was its rather anonymous existence. Its biggest challenge today is how to

have expressed concerns about major players such as China or the EU gaining more influence through a permanent observer status in the Arctic Council.[133]

The Arctic Council has also been challenged by current permanent observer states seeking more influence and better status, calling into question the disparity between Arctic and non-Arctic nations.[134] However, Member States of the Arctic Council stated that they wish to maintain its "regional identity",[135] thus implying that they want to uphold the exclusive membership of states with sovereignty over Arctic territory. But with the growing level of interest from non-Arctic states in the region and the increasing accessibility of ABNJ which provides for legitimate rights and interests for non-coastal states, the Arctic states will have to reconsider the limited role they grant to non-Arctic states in Arctic cooperation.[136]

gg) Insufficient Coordination and Cooperation with Other Arctic Bodies

Another overarching issue that the Arctic Council has to solve is the growing number of organisations dealing with Arctic matters.[137] Although collaboration between the Arctic Council and these other Arctic-related bodies is improving, the risk of duplication of work and consequent unnecessary expenditures of the sparse resources remains.[138]

(1) Arctic Cooperative Bodies Addressing Environmental Concerns

Various cooperative bodies responsible for (parts) of the Arctic Region have functions that (partially) overlap with the Arctic Council.

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deal with the growing list of states who want to become observers", see Alister Doyle, "New Arctic naval challenges seen as ice thaws," *Reuters*, May 11, 2011, http://www.reuters.com/article/2011/05/11/us-arctic-norway-idUSTRE74A3JY20110511.

[133] N.N., Observers role specification in Arctic Council completed-official (2011), Amber bridge, available at: http://ambbr.org/newstext?id=6415&lang=eng, last visited 26 March 2012.

[134] Koivurova, *supra* note 106, at 135.

[135] Doyle, *supra* note 132.

[136] See Brooks B. Yeager, "Managing Towards Sustainability in the Arctic: Some Practical Considerations," in *New Chances and New Responsibilities in the Arctic Region*: *Papers from the International Conference at the German Federal Foreign Office in cooperation with the Ministries of Foreign Affairs of Denmark and Norway*, *11–13 March 2009*, *Berlin*, ed. Georg Witschel et al., 567–78 (Berlin: Berliner Wissenschafts-Verlag), at 577.

[137] The overview of the international, regional and national organisations focused on the Arctic provided by the Russian Geographical Society amounts to some 40 organisations with relation to the environment, see Homepage of the Russian Geographical Society, International, regional and national organizations focused on the Arctic, available at: http://int.rgo.ru/arctic/arctic-overview/international-regional-and-national-organizations-focused-on-the-arctic/, last visited 8 August 2011.

[138] See Langlais, *supra* note 7, p. 4.

(a) Environmental Organisations

The **International Arctic Science Committee** (**IASC**) is an organisation that promotes international consultation and cooperation for scientific research concerning the Arctic.[139] It was established in 1990 and today comprises 19 member countries.[140]

IASC's principal mission is "to encourage, facilitate and promote basic and applied interdisciplinary research in the Arctic; and provide scientific advice on arctic issues, [. . .] including environmental [. . .] matters."[141] Its main work consists of the development of scientific research projects concerning the Arctic for which circumpolar or international cooperation is required.[142]

IASC is observer to the Arctic Council and collaborates with it in producing scientific assessments such as the aforementioned ACIA. Currently, IASC and Working Groups of the Arctic Council are working on the Snow Water Ice and Permafrost in the Arctic (SWIPA) project and the development of the Sustained Arctic Observing Networks (SAON) initiative.[143]

GRID-Arendal[144] is a centre of the Global Research Information Database (GRID) network located in Arendal, Norway. It was established in 1989 by the Government of Norway as a Norwegian Foundation.[145] In 2001, the United Nations Environment Programme (UNEP) designated GRID-Arendal as the official UNEP "key centre on Polar environmental assessments and early warning issues, with particular focus on the Arctic".[146] Its mission is to support UNEP by providing environmental information as well as communications and capacity building services for information management and assessment to enable informed decision-making of stakeholders.[147]

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[139] Founding Articles for an International Arctic Science Committee IASC, August 1990, reprinted in: IASC Handbook, available at: http://iasc.arcticportal.org/files/IASC_Handbook.pdf, last visited 5 August 2011.

[140] Member States are the eight Arctic States plus China, France, Germany, Italy, Japan, The Netherlands, Poland, the Republic of Korea, Spain, Switzerland, and the United Kingdom, see IASC homepage, Council Members, available at: http://iascnew.arcticportal.org/index.php/home/iasc/organization/council/canada, last visited 5 August 2011.

[141] IASC Handbook, *supra* note 139.

[142] Odd Rogne, "International Arctic Science Committee (IASC)," in *Encyclopedia of the Arctic*: *Volume 2 G-N*, ed. Mark Nuttall, 3 vols., 983–4 (New York: Routledge, 2005), at 983.

[143] Information retrieved from the IASC homepage, Partners, Affiliations, available at: http://iascnew.arcticportal.org/index.php/home/iasc/partners/affiliations, last visited 5 August 2011.

[144] GRID stands for Global and Regional Integrated Data, see UNEP 2006 Annual Report, available at: http://www.unep.org/pdf/annualreport/UNEP_AR_2006_English.pdf, last visited 22 September 2009.

[145] GRID-Arendal, Strategy 2009–2013, available at: http://www.grida.no/files/about/strategy-2009-2013.pdf, last visited 11 August 2011.

[146] See UNEP 2006 Annual Report, available at: http://www.unep.org/pdf/annualreport/UNEP_AR_2006_English.pdf, last visited 22 September 2009, p. 21.

[147] *Ibid*., see also GRID-Arendal's homepage, available at: http://www.grida.no/, last visited 11 August 2011.

UNEP has observer status in the Arctic Council.[148] As UNEP's designated Polar Centre, UNEP/GRID-Arendal represents UNEP in the Arctic Council and works with several Working Groups,[149] e.g. in the Circumpolar Biodiversity Monitoring Programme (CBMP), in coordinating spatial data management and in planning follow-up to the ACIA.[150]

(b) Inter-Parliamentary and Inter-Governmental Bodies

The **Barents Euro-Arctic Council** (**BEAC**) was established in 1993 at a Foreign Minister's Conference in Kirkenes, Norway by a Declaration of Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden and the European Commission.[151] At the same time, the **Barents Regional Council** (**BRC**), consisting of the leaders of the County Councils[152] and a representative of the indigenous peoples in the region,[153] was also created.[154] The BEAC and the BRC are the two principal institutions for cooperation in the Barents Euro-Arctic Region (BEAR).[155]

[148] Homepage of the Arctic Council, The Arctic Council, Observers, available at: www.arctic-council.org, last visited 8 August 2011.

[149] The Monaco Decision on Sustainable Development in the Arctic encouraged UNEP "to cooperate, as requested, with the Arctic Council, relevant multilateral environmental agreements and other relevant regional and international bodies", Governing Council of the United Nations Environment Programme, Tenth special session of the Governing Council/Global Ministerial Environment Forum, Monaco, 20–22 February 2008, Decision SS.X/2. Sustainable development of the Arctic region, doc. UNEP/GCSS.X/10, Annex I, available at: http://www.unep.org/gc/gcss-x/download.asp?ID=569, last visited 11 August 2011.

[150] Homepage of GRID-Arendal, Projects & Activities, available at: http://www.grida.no/polar/activities/4486.aspx, last visited 8 August 2011.

[151] Declaration, Cooperation in the Barents Euro-Arctic Region, Conference of Foreign Ministers in Kirkenes, 11 January 1993 (Kirkenes Declaration), available at: http://www.barentsinfo.fi/beac/docs/459_doc_KirkenesDeclaration.pdf, last visited 7 August 2011; the cited states are the Member States of the BEAC; in addition, there are nine observer states: Canada, France, Germany, Italy, Japan, Netherlands, Poland, United Kingdom, United States of America.

[152] The counties or their equivalents in the Member States are: in Finland: Kainuu, Lapland and Oulu Region; in Norway: Finnmark, Nordland and Troms; in Russia: Arkhangelsk, Karelia, Komi, Murmansk and Nenets; and in Sweden: Norrbotten and Västerbotten, see homepage of the Barents-Euro Arctic Region, available at: http://www.beac.st/in_English/Barents_Euro-Arctic_Council/Barents_Regional_Council.iw3, last visited 4 August 2011.

[153] Indigenous peoples of the region are the Saami (in Norway, Sweden, Finland and Russia), the Nenets (in Russia) and the Veps (in Russia), see *ibid*.

[154] Protocol Agreement from the Statutory Meeting of the Regional Council of the Barents Region (The Euro-Arctic Region), Kirkenes, 11 January 1993, available at: http://www.barentsinfo.fi/beac/docs/501_doc_StatutoryMeetingRegionalCouncil.pdf, last visited 4 August 2011.

[155] See Langlais, *supra* note 7, p. 9; both Councils are neither international organisations under international law nor do they create legally binding duties for their members, see Md W. Hasanat, "Cooperation in the Barents Euro-Arctic Region in the Light of International Law," in *The Yearbook of Polar Law*, vol. 2, ed. Gudmundur Alfredsson and Timo Koivurova, 279–309 2 (Leiden Boston: Martinus Nijhoff Publishers, 2010), at 280.

The main objective of cooperation in the BEAR is to "promote sustainable development in the Region, bearing in mind the principles and recommendations set out in the Rio Declaration and Agenda 21 of UNCED".[156] The environmentally related activities of the BEAC are performed by its Working Group on Environment (WGE), which was established in 1999.[157] Its work is divided into three sub-groups: The Subgroup on Cleaner production and sustainable consumption, the Subgroup on Nature Protection and the Subgroup on Water issues and Transboundary Cooperation. In addition, a temporary Subgroup on "Hot Spots" Exclusion was installed in 2010.[158]

The Regional Working Group on Environment (RWGE) was re-established in 2001 and works as a consultative body to the WGE.[159] Recently, the Working Groups have focused on climate change and certain "hot spots" representing environmental challenges in North-West Russia.[160] For the latter project, cooperation with the ACAP Working Group of the Arctic Council is envisaged.[161] Also, a network of protected areas in the Barents Region (BPAN) is to be developed cooperatively with the Arctic Council.[162]

Nonetheless, "calls for emphasising coordination with the [...] neighbouring multilateral councils [among them the Arctic Council] are increasing"[163] because the division of labour among the Arctic Council's working groups and those acting under the BEAR cooperation is lacking clarity[164] and thus implies the risk of duplication of work.

The **Nordic Council of Ministers** is a forum for intergovernmental cooperation between the Nordic Countries.[165] It was established through an amendment to the

[156] Kirkenes Declaration, *supra* note 151, p. 2.

[157] See homepage of the Barents Euro-Arctic Region, Working Groups, BEAC Working Groups, Environment, available at: http://www.beac.st/?DeptID=8555, last visited 4 August 2011.

[158] *Ibid.*

[159] See homepage of the Barents Euro-Arctic Region, Working Groups, Regional Working Groups, Environment, available at: http://www.beac.st/?DeptID=8560, last visited 4 August 2011.

[160] See Homepage of the Barents Euro-Arctic Region, available at: http://www.beac.st/?DeptID=8555, last visited 4 August 2011.

[161] Swedish Chairmanship of the Barents Euro-Arctic Council, available at: http://www.barentsinfo.fi/beac/docs/SWE_chairmanship_programme_for_BEAC_WGE_2010_2011.pdf, last visited 4 August 2011.

[162] The Swedish Chairmanship of the Barents Euro-Arctic Council lists among the priorities of the Working Group on the Environment "Supporting the development of a representative and well-managed, in cooperation with the Arctic Council", Swedish Chairmanship of the Working Group on the Environment 2010–2011, Swedish Chair of the Barents Euro-Arctic Council, *supra* note 161.

[163] Barents Euro-Arctic Region, Swedish Chairmanship of the Barents Euro-Arctic Council, The Barents Cooperation, November 2010, Information paper, p. 5, available at: http://www.barentsinfo.fi/beac/docs/Barents_comprehensive_information_paper_November_2010_English.pdf, last visited 4 August 2010.

[164] See Stokke, Hønneland and Schei, *supra* note 78, at 89.

[165] Denmark, Finland, Iceland, Norway and Sweden plus the Home Rule Governments of the Faeroe Islands and Greenland and the Regional Government of the Åland Islands, see Treaty of

Treaty of Co-operation between Denmark, Finland, Iceland, Norway and Sweden (the Helsinki Treaty)[166] in 1971.

The purpose of inter-governmental co-operation in the Nordic Council of Ministers is to work toward joint Nordic solutions, *inter alia* in the field of climate and energy issues. Joint Nordic action is supposed to enable the individual countries to make a greater impact at both the European and global level.[167]

The Nordic Council of Ministers is advised by the **Nordic Council**, a forum for cooperation between parliamentarians from Denmark, Finland, Iceland, Norway and Sweden as well as from the Faroe Islands, Greenland and Åland.[168] It was established in 1952, but commenced work on the Arctic Region only in 1993.[169] In 1996, the Nordic Council of Ministers started its "Arctic Cooperation Programme" that was designed to serve as a means for cooperation with other regional councils, in particular the Arctic Council, the BEAC and the EU.[170] In addition to special Arctic working programmes, the Council of Ministers has also established an Arctic research programme.[171] The Nordic Council of Ministers also participates in the Arctic Council as observer.[172]

The **Conference of Parliamentarians of the Arctic Region** (**CPAR**) is a parliamentary body that consists of delegations appointed by the national

Co-operation between Denmark, Finland, Iceland, Norway and Sweden (the Helsinki Treaty), signed 23 March 1962, entered into force 1 July 1962, as amended by Agreements that were signed on 13 February 1971, 11 March 1974, 15 June 1983, 6 May 1985, 21 August 1991, 18 March 1993, and 29 September 1995, preamble and article 60, available at: http://www.norden.org/en/about-nordic-co-operation/agreements/treaties-and-agreements/basic-agreement/the-helsinki-treaty, last visited 5 August 2011.

[166] Helsinki Treaty, *supra* note 165.

[167] See homepage of the Nordic Council of Ministers, Why the Nordic Council of Ministers, available at: http://www.norden.org/en/nordic-council-of-ministers/the-nordic-council-of-ministers/why-the-nordic-council-of-ministers, last visited 5 August 2011.

[168] See homepage of the Nordic Council, About the Nordic Council, available at: http://www.norden.org/en/nordic-council/the-nordic-council, last visited 5 August 2011.

[169] Geir H. Haarde, "International cooperation and action for the Arctic environment and development: An overview of parliamentarian efforts," in *Arctic Development and Environmental Challenges* (*supra* note 9), 65–69, at 66. That year, the Nordic Council convened a conference in Reykjavik Iceland, on development and protection of the Arctic region, see The Nordic Council's International Conference for Parliamentarians on Development and Protection of the Arctic region, final document, Reykjavik, Iceland, 17 August 1993, reprinted in Vidas, *Arctic Development and Environmental Challenges*, *supra* note 9, appendix 5.

[170] Nikolaj Bock, "Nordic Council of Ministers - Arctic Cooperation," (Nordic Council of Ministers), p. 1; in September 2008, the Nordic Council of Ministers hosted a Conference in Ilulissat, Greenland, on how Arctic issues can be addressed effectively by the EU, "Common concern for the Arctic: Conference arranged by the Nordic Council of Ministers 9–10 September 2008, Ilulissat, Greenland," ANP (Nordic Council of Ministers).

[171] The Nordic Council of Ministers' Arctic Co-operation Programme 2009–2011, November 2008.

[172] Homepage of the Arctic Council, The Arctic Council, Observers, available at: www.arctic-council.org, last visited 8 August 2011.

parliaments of the eight Arctic states and the European Parliament. The conference furthermore comprises Permanent Participants representing Indigenous peoples, and observers from governments and inter-parliamentary organisations as well as from observer states and relevant international organisations. The conference meets every 2 years. It adopts a statement with recommendations to the Arctic Council and to the governments of the eight Arctic states and the European Commission.[173]

Between conferences the Arctic parliamentary cooperation is carried on by a **Standing Committee** (**SCPAR**), which started its activities in 1994. At the Nordic Council's conference on development and protection of the Arctic region in 1993, participants decided to establish a Standing Committee of Parliamentarians of the Arctic Region to promote the conference's goals, above all the strengthening of cooperation among the Arctic States and the establishment of the Arctic Council.[174] Since the constitution of the Arctic Council, the Standing Committee has focused on promoting the work of the Council.[175] SCPAR also takes part in the work of the Arctic Council as an observer.

The **Northern Dimension** (**ND**) is a "shared policy" between the European Union, Norway, Iceland and the Russian Federation,[176] originally initiated in 1999, but renewed with effect from 1 January 2007.[177] Its main objective is to enhance cooperation in Northern Europe, concentrating on matters of particular importance for the north such as environment, health and social issues as well as indigenous peoples' issues.[178]

Cooperation within the ND takes place at two levels[179]: At the higher level, the ND is a policy concept geared to drawing attention to Northern Europe and promoting cooperation especially with Northwest Russia. At the practical level, the ND encompasses "partnerships and all cross-border and trans-regional activities pursued in the area: European Union projects, as well as the work of individual

[173] Information retrieved from the website of the CPAR, available at: http://www.arcticparl.org/, last visited 22 September 2009.

[174] The Nordic Council's International Conference for Parliamentarians on Development and Protection of the Arctic region, final document, *supra* note 169.

[175] See Langlais, *supra* note 7, p. 31.

[176] Political Declaration on the Northern Dimension Policy, 24 November 2006, p. 1, available at: http://eeas.europa.eu/north_dim/docs/pol_dec_1106_en.pdf, last visited 11 August 2011.

[177] The renewed ND policy was launched at the Helsinki Summit in November 2006. Consequently, the cooperation among its actors was reinforced. At the political level the new ND Political Declaration (*supra* note 176) and ND Policy Framework Document (Northern Dimension Policy Framework Document, 24 November 2006, available at: http://eeas.europa.eu/north_dim/docs/frame_pol_1106_en.pdf, last visited 11 August 2011) were adopted to substitute the Action Plans of 2000–2003 and 2004–2006. The main feature of the renewed policy is the co-ownership of the EU, Iceland, Norway and Russia (originally, there were seven partners, namely Iceland, Norway, Estonia, Latvia, Lithuania, Poland and Russia, of which four joined the EU in 2004, for further reading see Anne Haglund-Morrissey, "Conceptualizing the 'New' Northern Dimension: A Common Policy Based on Sectoral Partnerships," *Journal of Contemporary European Studies* 16, no. 2 (2008) (accessed August 11, 2011), at 204.

[178] Political Declaration on the Northern Dimension Policy, *supra* note 176.

[179] Markku Heikkilä, "The Northern Dimension," (23.08.2006) (accessed August 11, 2011), p. 9.

countries, groups of countries, the European Commission, organisations, provinces and local players."[180]

Besides the major partners, there is a multitude of other participants in ND policy, including the regional Councils in the North [BEAC, the Arctic Council, the Nordic Council of Ministers and the Council of the Baltic Sea States (CBSS)], international financial institutions, such as the European Bank for Reconstruction and Development (EBRD), NGOs, trade unions etc. Canada and the United States are observers.[181]

The Arctic and subarctic areas including the Barents Region, are priority areas for the ND policy[182] and protection of the Arctic ecosystems is one of the matters under the prioritised work field comprising environment, nuclear safety and natural resources.[183]

Conscious of the risk of replicating tasks, the Senior Officials of the Northern Dimension wish to elaborate ways of developing their Arctic policy "without duplicating the work of the Arctic Council and the Barents Euro-Arctic Council".[184]

(c) Sub-Regional Cooperation

The **Northern Forum** is an organisation of subnational or regional units of government—provinces, counties, states, and okrugs—located in seven countries[185] (Canada, China, Iceland, Japan, the Republic of Korea, the Russian Federation and the United States of America). It was established in 1990 following a Canadian initiative. The Forum's goal is to support exchange and cooperation between northern regions that share similar climatic and natural conditions.[186] Cooperation takes place through four Northern Forum Programs: Business Support Services, Society and Culture, Sustainable Economic Development and Environment.

Most members of the Forum are sub-national governments, but membership is open to commercial institutions. These members are called business partners and must have demonstrated interests in northern issues relevant to the Forum's governmental members. Business partner membership has to be approved by a region of the Northern Forum. The business partners can participate in open meetings, but have no vote.[187]

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[180] *Ibid.*

[181] Northern Dimension Policy Framework Document, *supra* note 177, p. 1.

[182] *Ibid.*, p. 1.

[183] *Ibid.*, p. 5.

[184] Progress Report submitted to the Second Ministerial meeting of the Renewed Northern Dimension Policy, Oslo, 2 November 2010, p. 12, available at: http://eeas.europa.eu/north_dim/docs/progress_report_final.pdf, last visited 11 August 2011.

[185] Government units from Finland are partners and observers, see homepage of the Northern Forum, Member Regions Map, available at: http://www.northernforum.org/servlet/content/membermap.html, last visited 11 August 2011.

[186] The Northern Forum, Hokkaido Declaration, of the Second General Assembly of the Northern Forum, Sapporo, Japan, 14 September 1995, p. 1, available at: http://www.northernforum.org/servlet/download?id=216, last visited 11 August 2010.

[187] Information retrieved from the website of the Northern Forum, available at: http://www.northernforum.org/servlet/content/mission.html, last visited 22 September 2009.

The Northern Forum has observer status in the Arctic Council[188] and stressed the importance of this role and of relations with other multilateral bodies to address regional concerns.[189] It also recognised the significance of the Arctic Council's work concerning climate change and committed to continuously supporting the Council's Working Group.[190]

(2) No Joining of Forces

As has been shown, the regional soft-law regime governing the Arctic marine environment includes a multitude of different initiatives on different levels of cooperation, with varying composition of participants and stakeholders and divergent main work areas, but also overlapping memberships and activities.

None of the cited regional bodies appears to have ambitions to address governance of the marine Arctic in an overarching manner, possibly coordinating and joining parallel activities.[191] As is the case for the Arctic Council, most of the organisations suffer from the significant restraint of limited funding followed by a lack of resources and staff.[192] Therefore, it cannot be expected that any of the bodies will employ considerable resources to manage the challenge of potentially rivalling bodies dealing with Arctic environmental protection.

This is not to say that there is no collaboration among the different associations. As has been indicated, awareness of the need to coordinate work and cooperate in different fields is present in many organisations. Many of the organisations listed here participate in the work of the Arctic Council as observers. Also, the redundancy of membership supports exchange between the different bodies. However, actual cooperation mainly occurs for specific projects for a limited period of time.[193] Overall, the various organisations remain separate bodies following their own agendas and priorities; there is no overarching policy-setting mechanism that serves to combine efforts regarding environmental protection in the marine Arctic.[194]

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[188] Homepage of the Arctic Council, The Arctic Council, Observers, available at: www.arctic-council.org, last visited 8 August 2011.

[189] The Northern Forum X General Assembly, Pyeong-Chang Declaration, Pyeong-Chang, Gangwon Province, Republic of Korea, 3 June 2011, p. 2, available at: http://www.northernforum.org/servlet/download?id=3723, last visited 11 August 2011.

[190] *Ibid.*; in the past, cooperation between these two bodies has faced challenges, see Oran R. Young, "Can the Arctic Council and the Northern Forum find common ground?," *Polar Record* 38, no. 207 (2002), 289–296.

[191] See Stuart Chapin and Neil Hamilton, "Policy Options for Arctic Environmental Governance: Prepared by the Environmental Governance Working Group," (Arctic Transform, 5 March 2009), p. 6.

[192] E. C. H. Keskitalo, ""New Governance" in the Arctic and Its Role for Supporting Climate Change Adaptation," in *Climate governance in the Arctic* (*supra* note 82), 97–116, at 111.

[193] *Ibid.*

[194] Chapin and Hamilton, *supra* note 191, p. 3; Commission of the European Communities, Communication from the Commission to the European Parliament and the Council, The European Union and the Arctic Region, COM(2008) 763 final, Brussels, 20.11.2008, p. 10.

4 Conclusion and Outlook

The regional regime applicable to the Arctic marine environment is essentially one of cooperation between the Arctic states on national, regional and sub-regional level. This cooperation is quite a recent phenomenon. It was formerly hindered by the inaccessibility of the ice-covered region and later by the area's character as a stage for the Cold War.

A starting point for regional cooperation was Mikhail Gorbachev's speech in Murmansk in 1987, in which he argued for greater collaboration among the Arctic states. Two years later, concerns about transboundary environmental hazards triggered a Finish initiative that resulted in the creation of the Arctic Environmental Protection Strategy (AEPS) among the eight Arctic states in 1991. Consequently, six priority pollution problems in the region were identified (POPs, Oil Pollution, Heavy Metals, Noise, Radioactivity, and Acidification) and action plans to combat these were set up. Under the AEPS, four Working Groups were established that were dedicated to different environmental topics such as monitoring and assessment or protection of the marine environment.

In 1996, the AEPS was subsumed by the Arctic Council that broadened its mandate to include the issue of sustainable development. The Council is not an international organisation, but an intergovernmental forum that consists of the Member States (the eight Arctic states Canada, Denmark, Finland, Iceland, Norway, Sweden, Russia and the USA), the Indigenous Peoples' Organisation as Permanent Participants, certain states and organisations as observers, ad-hoc observers, the rotating Chair, the Secretariat and the Working Groups.

The main work of the Arctic Council takes place within the Working Groups, which carry out scientific assessments of the Arctic environment, issue reports or elaborate guidelines. Every two years, the Member States gather at a meeting and deliver a non-binding declaration.

The strength of the Arctic Council consists in the monitoring and scientific assessment of transboundary threats for the Arctic environment. Furthermore, its creation has put formerly widely neglected Arctic environmental concerns on the agenda of the states involved.

However, the effectiveness of the Council in terms of environmental protection in the Arctic suffers from considerable restraints. A major limitation is the recommendatory character of its declarations, which cannot create legally binding obligations for the Arctic states. The Council's work is furthermore weakened by the lack of structural funding, making it dependent on individual state's commitment to single projects. Moreover, the Arctic Council lacks a permanent secretariat, although its establishment is envisaged. Yet, the biannually rotating chairmanship prevents the elaboration of long-term programmes. In addition, for comprehensive protection of the Arctic environment, the Arctic Council's mandate would have to be broadened to include fisheries and its sectoral approach would have to be abandoned in exchange for an integrated method.

In recent times, exclusive gatherings of the five Arctic coastal states have challenged the Arctic Council's role as principal forum for cooperation in the region.

Another issue for the Council's work is its division of labour with other, formally unrelated cooperative bodies in the region dealing with similar matters as the Arctic Council. There is a plethora of bodies in the Arctic Region, promoting cooperation at different levels, with partially overlapping mandates and memberships. So far, no overall coordination and cooperation between these organisations is taking place. Thus, the Arctic Council faces the challenge of duplication of work and exhaustion of the scarce resources dedicated to environmental concerns in the region.

To summarise, the Arctic Council suffers from various restrictions, above all the soft-law character of its decisions and the lack of a permanent funding system.

Recently, a potential change has been introduced by the conclusion of the "first legally binding agreement negotiated under the auspices of the Arctic Council"[195] by the eight Arctic States—the Agreement on cooperation on Aeronautical and Maritime Search and Rescue in the Arctic.[196] This Treaty might mark a milestone in the cooperation among the Arctic States and constitute the beginning of a series of other 'hard' and international agreements to be negotiated in the future. At the last meeting of the Arctic Council in May 2011, the ministers decided to establish a task force for the development of an international instrument on Arctic marine oil pollution preparedness and response.[197]

However, it is important to stress that this development indicates no change in the working mechanisms of the Council itself: the Declarations issued, its enforcement and follow-up will continue to show the same deficiencies identified above. While there are chances that more binding treaties will be negotiated under the umbrella of cooperation in the Arctic Council, it is highly unlikely that the Council itself will alter its structure fundamentally so as to become a regulatory body.[198] Its members have made quite clear that they do not favour this approach and see no need for such a transformation.[199]

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[195] Arctic Council, Nuuk Declaration on the occasion of the Seventh Ministerial Meeting of The Arctic Council, *supra* note 130, p. 2.

[196] Arctic Search and Rescue Agreement, *supra* note 114.

[197] Arctic Council, Nuuk Declaration, *supra* note 33, p. 4.

[198] See Koivurova, *supra* note 76, at 152.

[199] Particularly the US has been very reluctant to enter into any legally binding commitment, see National Security Presidential Directive No. 66 by president George W. Bush, Arctic Region Policy, January 9, 2009, available at: http://www.fas.org/irp/offdocs/nspd/nspd-66.htm, last visited 19 May 2010. "It is the position of the United States that the Arctic Council should remain a high-level forum devoted to issues within its current mandate and not be transformed into a formal international organization, particularly one with assessed contributions. The United States is nevertheless open to updating the structure of the Council, including consolidation of, or making operational changes to, its subsidiary bodies, to the extent such changes can clearly improve the Council's work and are consistent with the general mandate of the Council."

Besides, the Search and Rescue Agreement only addresses a sectoral issue. Even if more sector-specific treaties follow, there seems to be no ambition among the Arctic States to address environmental concerns in the marine Arctic in any overarching and legally binding manner.

Thus, the role of the Arctic Council in the future will probably continue to be based predominantly in coordinated monitoring, thus providing the factual basis for remedial action. In addition, the Council might continue to draw attention to Arctic problems on the international level (particularly regarding climate policy) as it has successfully done in the context of long-range transported POPs.[200]

However, to effectively protect and manage the Arctic marine environment in light of the massive transformations resulting from climate change, this is clearly not enough. As valuable as the Arctic Council was and is for region-building, monitoring and awareness-raising, as a standalone organisation it cannot adequately protect the environment from the upcoming threats, especially those caused by increased and competing uses of the Arctic marine area.

IV The International Legal Regime for the Arctic Marine Environment

The following section covers the international regime for governance of the Arctic marine environment. For this purpose, the legal instruments regulating the use and protection of this area will be presented.[201]

As mentioned above, the global climate change framework—although indirectly governing the Arctic marine environment—is beyond the scope of this assessment.[202] Rather, the adequacy of the applicable framework in the Arctic region will be evaluated as far as it governs current and upcoming human activities occurring within this region.

Almost all the international conventions relating to the protection of the marine environment apply to the Arctic.[203] These include *inter alia* the Conventions under

[200] See Stokke, Hønneland and Schei, *supra* note 78, p. 91; 97 *et seq*.

[201] For an overview of instruments relating to marine environmental protection, see the German Advisory Council on the Environment, Marine Environment Protection for the North and Baltic Seas, Special Report, February 2004, p. 35.

[202] Regarding this issue see Koivurova, Keskitalo and Bankes, eds., *Climate governance in the Arctic* (*supra* note 82) and Alf H. Hoel, "Climate change," in *International cooperation and arctic governance*: *Regime effectiveness and northern region building*, ed. Olav Schram Stokke and Geir Hønneland, 112–37 (London: Routledge, 2007).

[203] Linda Nowlan, Arctic Legal Regime for Environmental Protection, IUCN Environmental Policy and Law Paper No. 44, 2001, IUCN, Gland, Switzerland and Cambridge, UK, in collaboration with IUCN Environmental Law Centre, Bonn, Germany, p. 18; apart from the agreements listed in the text, other agreements apply including the 1990 International Convention on Oil Pollution Preparedness, Response and Co-operation (IMO Doc. OPR/CONF/25); 1979

the IMO, particularly the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)[204] and the 1973 International Convention for the Prevention of Pollution from Ships as amended by the 1978 MARPOL Protocol (MARPOL 73/78)[205]; the 1992 Convention on Biological Diversity[206]; the 1973 Convention on International Trade in Endangered

Convention on the Conservation of Migratory Species of Wild Animals (1651 UNTS 333); 1916 Convention for the Protection of Migratory Birds between Canada and the United States (Treaty Series No. 7, 1917); 1987 Agreement on the Conservation of the Porcupine Caribou Herd between Canada and the United States; 1911 Convention for the Preservation and Protection of Fur Seals (104 BFSP 175); 1973 Agreement on the Conservation of Polar Bears (27 UST 3918); 1946 International Convention for the Regulation of Whaling (161 UNTS 72); 1989 Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (1673 UNTS 126); 1971 Convention on Wetlands of International Importance Especially as Waterfowl Habitat (996 UNTS 245); 2000 Convention on the Trans-boundary Effect of Industrial Accidents (2105 UNTS 457); 1996 I.E. Convention on Nuclear Safety (1963 UNTS 293); and the legal instruments relating to fisheries management, which will be dealt with later. In addition, there are several bilateral agreements relating to the marine environment in the Arctic, including the Agreement Between Sweden and Norway Concerning Certain Issues Over Water Rights; Agreement Between the Finnish Republic and the Soviet Union Concerning Frontier Watercourses; Agreement Concerning Frontier Rivers Between Finland and Sweden; Agreement Between the United States of America and Canada Relating to the Exchange of Information on Weather Modification Activities; Agreement Between Finland and Norway on Finnish Norwegian Borderwater Commission; Agreement Between the Government of the Kingdom of Denmark and the Government of Canada for Cooperation Relating to the Marine Environment; Agreement Between the Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd; Agreement Between the Government of the United States of America and the Government of Canada on Air Quality; Action Program Between Finland and the Russian Federation with a view to Reduce Pollution and Implement Water Protection in the Baltic Sea Area as well as Other Areas Near the Border of Finland and Russian Federation; 1953 Convention between the United States of America and Canada for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and the Bering Sea; Agreement between the United States of America and the Government of the Union of Soviet Socialist Republics on Mutual Fisheries Relations; Agreement between the Government of the Kingdom of Norway and the Government of the Union of the Soviet Socialist Republics on Mutual Fishing Relations; 1971 Agreement between the Government of Canada and the Government of Norway on Sealing and Conservation of the Seal Stocks in the Northwest Atlantic; Agreement between the Government of Norway and the Government of the Union of Soviet Socialist Republics on Measures Regulating the Catch and Conserving Stocks of Seals in the Northeastern Part of the Atlantic Ocean. There are also various sub-regional treaties relevant for the marine Arctic environment, such as the Nordic Environment Protection Convention. This research focuses on the international legal framework for the Arctic marine environment, and thus the sub-regional and bilateral agreements are excluded from the assessment.

[204] Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, concluded 29 December 1972, entered into force 30 August 1975, 26 UST 2403.

[205] International Convention for the Prevention of Pollution from Ships, concluded 2 November 1973, entered into force 2 October 1983, 1340 UNTS 184 as amended by the Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, concluded 17 February 1978, entered into force 2 October 1983, 1340 UNTS 61.

[206] Convention on Biological Diversity, concluded 5 June 1992, entered into force 29 December 1993, 1760 UNTS 79.

Species of Wild Fauna and Flora (CITES)[207]; the 1972 Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)[208]; or the 1997 Espoo Convention on Environmental Impact Assessment in a Trans-boundary Context.[209]

The conventions that apply to the marine Arctic can be grouped into three different categories: treaties regulating certain geographic areas of the Arctic region (II.), treaties regulating single sectors of marine activity (III.) and treaties dealing with particular species (IV.). Each of these categories will be explored with the use of an example in the following section, and gaps and deficits in the regime governing the Arctic marine environment will be identified.[210]

To begin, the UNCLOS provisions relevant for governance of the Arctic marine environment will be reviewed. UNCLOS as the "Constitution for the Oceans"[211] regulating all legal regimes and activities on the seas and oceans forms the legal basis for the protection of the marine environment.[212] Since there is no 'Arctic Treaty' governing the marine Arctic, UNCLOS at the same time embodies the only overarching legal framework for the protection of the Arctic marine environment.[213]

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[207] Convention on International Trade in Endangered Species of Wild Fauna and Flora, concluded 3 March 1973, entered into force 1 July 1975, 993 UNTS 243.

[208] Convention Concerning the Protection of the World Cultural and Natural Heritage, concluded 23 November 1972, entered into force 15 December 1975, 1037 UNTS 151.

[209] Convention on Environmental Impact Assessment in a Transboundary Context, signed 25 February 1991, entered into force 10 September 1997, 30 ILM 803.

[210] See Colette de Roo, "Environmental governance in the marine Arctic," *Yearbook of Human Rights & Environment* 9 (2009), 101–170, at 101.

[211] Tommy T.B. Koh, President of the Third UN Conference on the Law of the Sea, A Constitution for the Oceans, available at: http://www.un.org/Depts/los/convention_agreements/texts/koh_english.pdf; Catherine Redgwell, "From Permission to Prohibition: The 1982 Convention on the Law of the Sea and Protection of the Marine Environment," in *The Law of the sea*: *Progress and prospects*, ed. David Freestone, Richard Barnes and David M. Ong, 180–91 (Oxford: Oxford University Press, 2006), at 186; the term "Constitution" should and was arguably meant to be understood as a "metaphor rather than a legal concept (Rainer Lagoni, "Commentary," in *Stability and change in the law of the sea*: *The role of the LOS Convention*, ed. Alex G. Oude Elferink, 49–51, Series A, Modern international law 24 (Leiden: Nijhoff, 2005), at 49) in the sense that it provides the basic legal framework for the ocean. For the reasons why UNCLOS regarding its legal character cannot be equalized with national constitutions, see Rainer Lagoni, *ibid*.; Oran R. Young, "Commentary on Shirley V. Scott, "The LOS Convention as a constitutional Regime for the Oceans"," in *Stability and change in the law of the sea*: *The role of the LOS Convention*, ed. Alex G. Oude Elferink, 39–46, Series A, Modern international law 24 (Leiden: Nijhoff, 2005).

[212] United Nations, Impact of the entry into force of the 1982 United Nations, Report of the Secretary-General, 20 October 1997, Doc. A/52/491.

[213] Hans H. Hertell, "Arctic Melt: the Tipping Point for an Arctic Treaty," *The Georgetown International Environmental Law Review* 21, no. 3 (2009), at 571; see Budislav Vukas, "United Nations Convention on the Law of the Sea and the polar marine environment," in *Protecting the polar marine environment*, *supra* note 6, 34–56, at 34.

1 UNCLOS and Its Application to the Marine Arctic

Together with its two implementation agreements, the Part XI Deep-Sea Mining Agreement and the Fish Stocks Agreement, UNCLOS forms the cornerstone of the international law of the sea. It applies to the marine environment of the whole globe, thus covering the entire Arctic marine environment, however defined.[214] The global character of the Convention is confirmed by the inclusion of article 234 UNCLOS, which provides a specific provision concerning the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the EEZ.[215]

With the exception of the US, all Arctic states are parties to UNCLOS.[216] The Convention recognises the freedoms, rights, sovereignty, sovereign rights, jurisdiction and obligations of states within several maritime zones. States that can claim maritime zones in accordance with UNCLOS in the Arctic Ocean are Canada, Denmark for Greenland, Norway, and the Russian Federation as well as the US, which have coastal frontage in that ocean, and Iceland with coastal frontage on the Norwegian Sea.

a) Environmental Jurisdiction Within the Different Maritime Zones

The different maritime zones existing in the Arctic Ocean are internal waters, territorial seas, EEZs, continental shelves, the deep seabed beyond the limits of national jurisdiction known as the Area and high seas. These are the same zones prevailing in any other ocean.

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[214] Timo Koivurova and Erik J. Molenaar, "International Governance and Regulation of the Marine Arctic: Options for Addressing Identified Gaps," (January 2009), available at: http://img9.custompublish.com/getfile.php/1092818.1529.fewsuutsbp/Options+for+Addressing+IdentifiedGaps_0306.pdf?return=www.arcticgovernance.org, last visited 12 March 2012, p. 14.

[215] Myron H. Nordquist, ed., *United Nations Convention on the Law of the Sea*, *1982*: *A commentary*, vol. 4 (Dordrecht: Nijhoff, 1991), Article 234, 234.1.

[216] See United Nations Treaty Collection, Status of UNCLOS, available at: http://treaties.un.org/Pages/ViewDetailsIII.aspx?&src=TREATY&mtdsg_no=XXI~6&chapter=21&Temp=mtdsg3&lang=en, last visited 28 May 2010; however, the US considers UNCLOS as generally reflecting customary law of the sea and thus adapts its ocean policy accordingly, see Howard S. Schiffman, "U.S. Membership in UNCLOS: What effects for the marine environment?," *ILSA Journal of International and Comparative Law* 11, no. 2 (2005), 477–483, at 482; still, it has to be noted that the US takes the view that Part XI of UNCLOS on the Area does not reflect customary international law and accordingly does not create rights and obligations for non-parties. Furthermore, the dispute settlement mechanism in Part XV of UNCLOS is not able to become part of customary law due to its procedural nature, see Erik J. Molenaar, "Arctic Fisheries Conservation and Management: Initial Steps of Reform of the International Legal Framework," in *The Yearbook of Polar Law*, ed. Gudmundur Alfredsson and Timo Koivurova, 427–64 1 (Leiden Boston: Martinus Nijhoff Publishers, 2009), at 436.

UNCLOS recognises the sovereignty of a coastal state over its internal waters, archipelagic waters and territorial sea, the airspace above and its bed and subsoil. In these areas, the coastal state has exclusive access and control of living and non-living resources and all-encompassing jurisdiction over all human activities, Article 2 UNCLOS.

Each of the five littoral states to the Arctic Ocean has claimed an EEZ in the waters beyond and adjacent to its territorial sea.[217] In that zone the coastal state enjoys sovereign rights for the purpose of exploring, exploiting, conserving, and managing the natural resources, living and non-living, of the waters superjacent to the seabed and of the seabed and its subsoil, and in the same area, jurisdiction with regard to the establishment and use of artificial islands, installations and structures, marine scientific research and the protection and preservation of the marine environment, Article 56 UNCLOS. Other states, however, retain the right to enjoy the freedoms referred to in Article 87 of navigation and overflight and of the laying of submarine cables and pipelines, and other internationally lawful uses of the sea related to these freedoms, Article 58(1) UNCLOS. The maximum breadth of the EEZ is 200 nm measured from baselines determined in accordance with UNCLOS, Article 57.[218]

Each of the Arctic coastal states also has exclusive sovereign rights for the purpose of exploring its continental shelf and exploiting its natural resources, Article 77 UNCLOS, whereas these rights do not affect the legal status of the superjacent waters or of the air space above those waters and the exercise of these rights must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other States, Article 78(1) and (2) UNCLOS.

The continental shelf may extend more than 200 nm from properly established baselines if the geologic criteria set out in Article 76 UNCLOS are met.[219] For Parties to UNCLOS the Convention sets forth a procedure for establishment of the outer limits of the shelf beyond 200 nm, Article 76(4)–(7), Annex II, Article 4 UNCLOS. If the coastal State establishes its outer limits on the basis of recommendations of the Convention's Commission on the Limits of the Continental Shelf (CLCS), the limits are considered "final and binding", Article 76(8) UNCLOS.

[217] See Division for Ocean Affairs and the Law of the Sea (DOALOS), Summary of National Claims, 28 May 2008, available at: http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/PDFFILES/table_summary_of_claims.pdf, last visited 4 February 2011.

[218] Where the maximum breadth of the maritime zones set out in UNCLOS cannot be reached due to proximity of the baselines of opposite states, maritime boundaries have to be agreed on. To date, there are ten bilateral agreements delimiting maritime zone and continental shelf boundaries between the five countries that border the Arctic Ocean, in addition to unresolved boundary issues, Maritime jurisdiction and boundaries in the Arctic region, Durham University/International Boundaries Research Unit, updated 4 May 2010, available at: http://www.dur.ac.uk/resources/ibru/arctic.pdf, last visited 2 June 2010.

[219] See UN Commission on the Limits of the Continental Shelf, Scientific and Technical Guidelines of the Commission on the Limits of the Continental Shelf, UN Doc. CLCS/11, 13 May 1999.

The Russian Federation was the first of the Arctic states that made a submission on the outer limit of its extended shelf.[220] In its recommendation, the CLCS recommended the Russian Federation to "make a revised submission in respect of its extended continental shelf" in the central Arctic Ocean.[221] Consequently, the nation is collecting additional data to substantiate its submission and plans to make a resubmission to the CLCS in 2014.[222]

In 2006, Norway was the second Arctic State that made its submission to the CLCS,[223] which issued its recommendation in 2009.[224] Denmark together with Faroe followed in 2009 with a partial submission concerning the continental shelf north of the Faroe Islands[225] and in 2010 with a partial submission on the Southern Continental Shelf of the Faroe Islands.[226] Acquisition of data and preparation of submissions is still on-going in the areas north, north-east and south of Greenland.[227]

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[220] See Commission on the Limits of the Continental Shelf (CLCS), Outer limits of the continental shelf beyond 200 nautical miles from the baselines: Submissions to the Commission: Submission by the Russian Federation, submitted 20 December 2001, available at: http://www.un.org/depts/los/clcs_new/submissions_files/submission_rus.htm, last visited 4 February 2011.

[221] See UN General Assembly, Oceans and the law of the sea, Report of the Secretary-General, Addendum, 8 October 2002, UN Doc. A/57/57/Add.1, para 41.

[222] See Ted L. McDorman, "The Outer Continental Shelf in the Arctic Ocean," in *Law*, *technology and science for oceans in globalisation*: *IUU fishing*, *oil pollution*, *bioprospecting*, *outer continental shelf*, ed. Davor Vidas, 499–520 (Leiden: Nijhoff, 2010), at 515; Atle Staalesen, Historic Arctic expedition takes off from Arkhangelsk, BarentsObserver.com, 29 July 2010, available at: http://www.barentsobserver.com/historic-arctic-expedition-takes-off-from-arkhangelsk.4802715-16149.html, last visited 4 February 2011.

[223] CLCS, Outer limits of the continental shelf beyond 200 nautical miles from the baselines: Submissions to the Commission: Submission by the Kingdom of Norway, submitted 27 November 2006, available at: http://www.un.org/depts/los/clcs_new/submissions_files/submission_nor.htm, last visited 4 February 2011.

[224] See CLCS, Summary of the Recommendations of the Commission on the Limits of the Continental Shelf in Regard to the Submission made by Norway in respect of Areas in the Arctic Ocean, the Barents Sea and the Norwegian Sea on 27 November 2006, adopted 27 March 2009, available at: http://www.un.org/depts/los/clcs_new/submissions_files/nor06/nor_rec_summ.pdf, last visited 4 February 2011; Øystein Jensen, "Towards Setting the Outer Limits of the Continental Shelf in the Arctic: On the Norwegian Submission and Recommendations of the Commission," in *Law*, *technology and science for oceans in globalisation*, *supra* note 222, 521–38.

[225] Partial Submission of the Government of the Kingdom of Denmark together with the Government of the Faroes to the Commission on the Limits of the Continental Shelf, The Continental Shelf North of the Faroe Islands, submitted 29 April 2009, available at: http://www.un.org/Depts/los/clcs_new/submissions_files/dnk28_09/dnk2009executivesummary.pdf, last visited 4 February 2011.

[226] Partial Submission of the Government of the Kingdom of Denmark together with the Government of the Faroes to the Commission on the Limits of the Continental Shelf, The Southern Continental Shelf of the Faroe Islands, submitted 2 December 2010, available at: http://www.un.org/depts/los/clcs_new/submissions_files/dnk54_10/SFM-Executive_Summary_secure.pdf, last visited 4 February 2011.

[227] Denmark Ministry of Science, Technology and Innovation, The Continental Shelf Project, available at: http://a76.dk/lng_uk/main.html, last visited 4 February 2011.

Canada[228] and the United States[229] are in the process of collecting the necessary scientific data to support their submissions, sometimes working collaboratively.[230] The United States, however, may not make a submission because it is not a party to UNCLOS.[231] The establishment of the outer limit of their continental shelves is of utmost importance to the Arctic coastal states because of the vast resources expected to be found there.[232]

b) The "Arctic Article" 234 UNCLOS on Ice-Covered Waters

The extent of national authority for jurisdiction on environmental law in the marine Arctic is subject to Article 234 UNCLOS. This provision grants coastal States the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the EEZ, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. The coastal state's laws and regulations must have due regard to navigation, protection and preservation of the marine environment and be based on the best available scientific evidence.

Article 234 UNCLOS is sometimes called the 'Arctic Article'.[233] It was negotiated directly between Canada,[234] the US and the former Soviet Union, the states

[228] Foreign Affairs and International Trade Canada, Canada's Extended Continental Shelf, http://www.international.gc.ca/continental/index.aspx, last visited 4 February 2011.

[229] U.S. Department of State, Defining the Limits of the U.S. Continental Shelf, http://www.state.gov/g/oes/continentalshelf, last visited 4 February 2010.

[230] See Foreign Affairs and International Trade Canada, Third Canada-U.S. Joint Continental Shelf Survey to Showcase Scientific Cooperation in the Arctic, available at: http://www.international.gc.ca/media/aff/news-communiques/2010/238.aspx, last visited 4 February 2011.

[231] J. A. Roach, "International law and the Arctic: A guide to understanding the issues," *Southwestern Journal of International Law* 15, no. 2 (2009) 301–326, at 305; see Suzette V. Suarez, *The Outer Limits of the Continental Shelf*: *Legal Aspects of their Establishment*, 1st ed. (Heidelberg: Springer-Verlag, 2008), p. 180 *et seq*.; according to McDorman, the US "is not subject to the procedural obligation to submit information to the Commission", *id*., *supra* note 222, at 502; however, they "should not and cannot benefit from [an extended continental shelf] without the attached responsibilities", Suarez, *op*. *cit*.

[232] Most of it is thought to be situated within the 200 nm-zone.

[233] Nordquist, *supra* note 215; others refer to it as "Canadian clause" or "Arctic exception", see Rob Huebert, "Article 234 and Marine Pollution Jurisdiction in the Arctic," in *The law of the sea and polar maritime delimitation and jurisdiction*, *supra* note 74, 249–68, at 249.

[234] The inclusion of Article 234 into UNCLOS legitimised Canada's Arctic Waters Pollution Prevention Act (AWPPA) (R.S., 1985, c. A-12) by extending the right of Arctic coastal States to implement and enforce marine protection laws within the EEZ, see Hal Mills, "The Environment and the Northwest Passage," in *Transit management in the Northwest Passage*: *Problems and prospects*, Studies in polar research (Cambridge: Cambridge University Press, 1988), 8–64, at 13;

concerned.[235] It is the only provision in Part XII which grants coastal states the right, within its EEZ, to adopt and enforce its own non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution under the circumstances circumscribed in the article. For that matter, it is a *lex specialis*, especially with regard to Articles 211(5) and (6) UNCLOS, and overrides them when applied to a specific geographical area.[236]

This area is determined by the climatic conditions laid down in the article: "where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance." This wording raises various questions of interpretation. According to the Committee on Coastal State Jurisdiction Relating to Marine Pollution of the International Law Association the "article [. . .] does not excel in clarity, to say the least."[237]

Firstly, it has to be asked which particular conditions have to be present to meet the litmus test of "ice covering such areas for most of the year". One view regards those Arctic areas as covered by ice for most of the year, which feature an average ice cover for 6 months or more.[238] According to another interpretation, a 0.5 ice concentration for more than 8 months a year is required.[239]

No matter which definition is preferable, Article 234 UNCLOS might become inapplicable to the Arctic as soon as the amount and duration of the sea ice cover decreases as prognosticated due to the impacts of climate change. Sooner or later, according to both definitions, most of the Arctic would fail to be qualified as ice-covered for most of the year. Still, it could be argued that even a partial ice cover could be sufficient if there is an exceptional hazard to navigation.

Secondly, the question arises whether the phrase "within the limits of the exclusive economic zone" relates to the space between the outer and inner limits

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Nicholas C. Howson, "Breaking the ice: The Canadian-American dispute over the Arctic's Northwest passage," *Columbia Journal of Transnational Law* (1988), 337–375, at 354. The AWPPA extended Canada's jurisdiction for the prevention of pollution in waters north of 60°N to a zone 100 miles from the baseline from which the territorial sea is measured. Within this zone Canada would have the power to regulate all shipping, including the authority to prohibit it, and to prescribe standards on issues such as design construction, and manning for ships entering the zone. Powers of arrest and prosecution to enforce the provisions were included, see McRae, "The Negotiation of Article 234," in *Politics of the Northwest passage*, ed. Franklyn Griffiths, 98–114 (Kingston: McGill-Queen's Univ. Pr, 1987), at 101.

[235] Erik Franckx, "Should the Law Governing Maritime Areas in the Arctic Adapt to Changing Climatic Circumstances?," in *Climate governance in the Arctic* (*supra* note 82), at 129.

[236] Nordquist, *supra* note 215.

[237] Committee on Coastal State Jurisdiction Relating to Marine Pollution of the International Law Association.

[238] Koroleva, Markov, Ushakov, Legal Regime of Navigation in the Russian Arctic, Russian Association of International Maritime Law, Moscow 1995, p. 75.

[239] Franckx, Maritime claims in the Arctic: Canadian and Russian perspectives (Dordrecht: Nijhoff, 1993), p. 225, note 474.

of that zone (i.e. the 188 nm between the 12-mile-limit of the territorial sea and the 200-nm-limit of the EEZ) or to the 200-nm-wide space between the coastline and the EEZ-limit. The answer to that question determines whether the coastal state can adopt laws and regulations also as regards innocent passage through its territorial sea and transit passage through international straits.[240]

According to Article 55 UNCLOS, the EEZ is "an area beyond and adjacent to the territorial sea". This definition seems to restrict Article 234 UNCLOS to the EEZ alone.[241] However, it would seem quite irrational, if UNCLOS were to have conferred broader powers to the coastal state in its EEZ than in its territorial sea.[242]

Also disputed is whether Article 234 UNCLOS is applicable to international straits. Article 233, which exempts international straits from some marine pollution provisions, does not mention Article 234, thus implying that Article 234 is applicable to international straits.[243] On the other hand, no express provision excludes ice-covered straits from the regime for international straits as laid down in Part III UNCLOS. The UNCLOS negotiators did not deal with the issue, probably to avoid Canada and the United States taking a position on the status of the Northwest Passage.[244] However, an international strait in ice-covered waters not subject to stringent environmental protection regulation by the coastal state as envisaged by Article 234 would clearly undermine the purpose of this provision intended to protect the vulnerable ice-covered marine environment from pollution.[245] It therefore appears that Article 234 UNCLOS does apply to international straits.

Expressly exempted from Article 234's scope of application are warships, naval auxiliaries, and other vessels or aircraft owned or operated by a State and used only on government non-commercial service. Article 236 UNCLOS excludes these types of vessels from the Convention's provisions on the protection and preservation of the marine environment.

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[240] Tullio Scovazzi, "Legal Issues Relating to Navigation Through Arctic Waters," in *The Yearbook of Polar Law*, ed. Gudmundur Alfredsson and Timo Koivurova, 371–82 1 (Leiden Boston: Martinus Nijhoff Publishers, 2009), at 374.

[241] A.E Boyle, "Legal Regimes of the Arctic – Remarks," *American Society of International Law Proceedings* 82 (1988), 315–332, at 327.

[242] Douglas R. Brubaker, "Regulation of navigation and vessel-source pollution in the Northern Sea Route: Article 234 and state practice." In *Protecting the polar marine environment*, *supra* note 6, 221–43, at 227; see Robin R. Churchill and Alan V. Lowe, *The law of the sea*, 3. ed., Melland Schill studies in international law (Manchester: Manchester University Press, 1999), p. 348; Erik Franckx, ed., *Vessel-source pollution and coastal state jurisdiction*: *The work of the ILA Committee on Coastal State Jurisdiction Relating to Marine Pollution* (*1991–2000*) (The Hague: Kluwer Law International, 2001), p. 101.

[243] Donat Pharand, "The Northwest Passage in International Law," *The Canadian Yearbook of International Law* 17 (1979), 99–133, at 123.

[244] McRae, *supra* note 234, at 110.

[245] Michael Byers and Suzanne Lalonde, Who controls the Northwest Passage? *Vanderbilt Journal of Transnational Law* 42, no. 4 (2009): 1133–1210, at 1182.

c) High Seas

The high seas are all parts of the sea that are not included in the EEZ, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State, see Article 86 UNCLOS. Article 87(1) UNCLOS sets forth a list of freedoms of the high seas. These include, *inter alia*, freedom of navigation, overflight, scientific research and fishing, freedom to lay submarine cables and pipelines and freedom to construct artificial islands and other installations. As the list is not exhaustive, new or unnamed activities also come under the freedoms of the high seas.

In addition to the central Arctic Ocean, there are three pockets of high seas in the seas bordering the Arctic Ocean: the "Banana" hole in the Norwegian Sea, the "Loophole" in the Barents Sea and the "Doughnut" hole in the Bering Sea.[246]

On the high seas, the flag state is granted exclusive jurisdiction with only limited exceptions, see Articles 110(1), 111(1) and 218 UNCLOS. Articles 116–120 UNCLOS deal with the conservation and management of the living resources of the high seas.

d) The 'Area'

The so-called 'Area' is the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction, Article 1(1) UNCLOS. The Area and its resources [meaning all solid, liquid or gaseous mineral resources *in situ* in the Area at or beneath the seabed, including polymetallic nodules, article 133(a)] are the common heritage of mankind, Article 136 UNCLOS. Rights in the Area and to its resources can only be obtained with the authorisation of the International Seabed Authority established by UNCLOS and may not be appropriated by any state unilaterally, see Article 137 UNCLOS. Activities in the Area shall be carried out for the benefit of mankind as a whole, Article 140(1) UNCLOS.

Article 145 UNCLOS addresses the subject of protection of the marine environment in the Area. It gives the Authority the power to adopt appropriate rules, regulations and procedures for *inter alia*: the prevention, reduction and control of pollution and other hazards to the marine environment and of interference with the ecological balance of the marine environment, as well as for the protection and conservation of the natural resources of the Area and the prevention of damage to the flora and fauna of the marine environment.

Since the adoption of UNCLOS in 1982, the subject of environmental protection has assumed greater importance.[247] This is mirrored in the Agreement Relating to

[246] Molenaar, "Climate Change and Arctic Fisheries," in *Climate governance in the Arctic* (*supra* note 82), 145–170, at 150.

[247] Saty Nandan, "Administering the Mineral Resources of the Deep Seabed," in *The Law of the sea*: *Progress and prospects*, *supra* note 211, 75–92, at 88.

the Implementation of Part XI of the United Nations Convention on the Law of the Sea,[248] where it is stipulated that an application for approval of a plan of work shall be accompanied by an assessment of the potential environmental impacts of the proposed activities and by a description of a programme for oceanographic and baseline environmental studies in accordance with the rules, regulations and procedures adopted by the Authority.[249]

Furthermore, the Authority has adopted two different sets of regulations to give practical effect to the mining regime in the Area. Firstly, it has issued the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area.[250] These regulations include the forms necessary to apply for exploration rights as well as standard terms of exploration contracts. Secondly, On 7th May 2010 the Assembly of the International Seabed Authority adopted the Regulations on Prospecting and Exploration for Polymetallic Sulphides.[251] A third set of regulations, the Regulations on Prospecting and Exploration for Cobalt-Rich Crusts have recently been developed. The complete set of these regulations is supposed to form part of a comprehensive Mining Code together with recommendations issued by the Authority's Legal and Technical Commission to guide contractors on the assessment of the environmental impacts of exploration for polymetallic nodules.

It remains to be seen whether this regime will play a decisive role for the Arctic Region as projections concerning the possible extent of extended continental shelves show that only a very small portion of the "Area" is likely to remain.

e) Duty to Protect the Marine Environment

Section XII UNCLOS is dedicated to marine environment protection. Pursuant to Article 192 UNCLOS, states have the obligation to protect and preserve the marine environment. This provision forms the introduction to Part XII and sets the framework for the substantive stipulations that follow.[252] It contains a general principle of law[253] and can be regarded as establishing the foundation for the international

[248] Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of December 1982, 28 July 1994, reproduced in (1994) 33 ILM 1309.

[249] *Ibid*., Annex, Section 1, paragraph 7.

[250] Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, adopted 13 July 2000, available at: http://www.isa.org.jm/files/documents/EN/Regs/MiningCode.pdf, last visited 16 June 2010.

[251] Regulations on prospecting and exploration for polymetallic sulphides in the Area, available at: http://www.isa.org.jm/files/documents/EN/Regs/PolymetallicSulphides.pdf, last visited 28 October 2012.

[252] Nordquist, *supra* note 215, article 192, 192.1.

[253] This is the reason why the obligation contained in the provision addresses "States" as opposed to "States Parties", see *ibid*., 192.8.

environmental law of the sea.[254] The obligation it contains refers to "all parts of ocean space both within and beyond the limits of any national jurisdiction".[255] It does not refer to the extent of a state's jurisdiction over the seas.[256]

Article 193 UNCLOS grants states the sovereign right to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment. This provision likewise states a general principle of law.[257]

Article 194 UNCLOS addresses the prevention, reduction and control of pollution of the marine environment. Article 1(4) UNCLOS defines "pollution of the marine environment" in all-encompassing terms as "introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which results or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities, including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities".

Pursuant to Article 194(1) UNCLOS states are required to take, "individually or jointly as appropriate, all measures [. . .] that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities". Apart from this general provision, UNCLOS deals with marine pollution based on its sources, i.e. land-based pollution, national seabed activities, activities in the international seabed area, dumping, vessel-source, and atmospheric pollution,[258] see Articles 207–212 UNCLOS. These provisions are complemented by the obligation to monitor and assess the marine environment, Articles 204–206, and to protect and preserve rare or fragile ecosystems and the habitat of depleted, threatened or endangered species and other forms of marine life, Article 194 (5) UNCLOS.

In addition, according to Article 197 UNCLOS, states are mandated to cooperate "in formulating and elaborating international rules, standards and recommended practices and procedures consistent with this Convention, for the protection and preservation of the marine environment, taking into account characteristic regional features". While cooperation on a global basis is "unconditionally mandatory",[259] cooperation on a regional basis is mandated "as appropriate" and thus depends on the circumstances of each particular region.

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[254] Jonathan I. Charney, "The protection of the marine environment by the 1982 United Convention on the Law of the Sea," *The Georgetown International Environmental Law Review* 7 (1995). 731–738, at 732.

[255] Nordquist, *supra* note 215, 192.11(b).

[256] *Ibid.*

[257] *Ibid.*, 193.6(b).

[258] See Christopher C. Joyner, "The legal regime for the Arctic Ocean," *Journal of Transnational Law & Policy* 18, no. 2 (2009), 195–245, at 221.

[259] Vukas, *supra* note 505, at 43.

f) Enclosed or Semi-Enclosed Sea

Arctic coastal states' obligation to cooperate—either directly or through a regional organisation—to protect and preserve the marine environment could also be deduced from the classification of the Arctic Ocean as enclosed or semi-enclosed sea,[260] Article 123 UNCLOS.

Whether the Arctic Ocean is an enclosed or semi-enclosed sea in terms of Articles 122 and 123 UNCLOS is disputed among legal scholars.[261] In Article 122 UNCLOS, "enclosed or semi-enclosed sea" is defined as a gulf, basin or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States.

Thus, there are two alternative definitions: For the qualification as an enclosed or semi-enclosed sea, a gulf, basin or sea has to be surrounded by two or more states and be *either* connected to another sea or the ocean by a narrow outlet *or* consist entirely or primarily of the territorial seas and EEZ of two or more coastal states.

The first part of the definition is "easily met by the Arctic Ocean. [. . .] [T]he Arctic basin is surrounded by the territories of the eight Arctic states: Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States".[262]

For the second part of the definition, the Arctic Ocean does not come under the first alternative, i.e. a sea that is connected to another sea or ocean by a *single* outlet due to the open sea areas of the Greenland and Norwegian Sea as well as the Bering Strait.[263]

According to *Pharand*, "the EEZs of the five Arctic states that actually border the Arctic Ocean (Canada, Denmark, Norway, Russia, and the United States) encompass about 60 % of the ocean",[264] a percentage that he considers as sufficient for fulfilling the requirement of consisting "primarily of the EEZ of two or more coastal states". However, other legal scholars reject this assertion.[265]

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[260] Schiffman, *supra* note 216.

[261] Rothwell, *supra* note 8, p. 211; Johannes E. Harders, "In quest of an Arctic legal regime: Marine regionalism; a concept of international law evaluated," *Marine Policy* (1987), 285–299, at 295; Tavis Potts and Clive H. Schofield, "The Arctic," *International Journal of Marine and Coastal Law* 23, no. 1 (2008), 151–176, at 151, footnote 5; Rayfuse, "Melting moments: The future of polar oceans governance in a warming world," *Review of European Community & International Environmental Law* 16, no. 2 (2007) 196–216, at 210.

[262] Donat Pharand, "The Arctic Waters and the Northwest Passage: A final revisit," *Ocean Development & International Law* 38, 1/2 (2007), 3–69, at 53.

[263] Harders, *Regionaler Umweltschutz in der Arktis* (Nomos-Verl.-Ges, 1997), p. 61.

[264] Pharand, *supra* note 262.

[265] Harders holds that the "treaty practice [. . .] is a strong reason for the presumption that a semi-enclosed sea is to be bordered by land for about 90 %", *id*., "In quest of an Arctic legal regime", *supra* note 261, at 295; Proelss and Müller share the view that 60 % do not suffice to qualify the Arctic Ocean as consisting "primarily" of EEZs. They argue that this estimation is confirmed by the *travaux préparatoires* in which the Arctic Ocean has never been referred to as a semi-enclosed sea, but has been dealt with as a case of its own, see *id*., "The legal regime of the Arctic Ocean,"

Irrespective of this debate, no obligation to cooperate follows from Article 123 UNCLOS. According to its wording, coastal states of an enclosed or semi-enclosed sea "should" cooperate in the exercise of their rights and duties under UNCLOS. This soft wording indicates that states are merely encouraged to cooperate and may make individual proposals. Thus, the Arctic States are only obligated to cooperate pursuant to Article 197 UNCLOS and this obligation applies only "as appropriate".

g) The Legal Status of the Northwest Passage

The status of the Northwest Passage had been relatively uncontroversial throughout much of the twentieth century, primarily due to impenetrability by all ships but powerful icebreakers.[266] Yet, "[t]he prospect of the Northwest Passage opening up to shipping has [. . .] led to the re-emergence of the dispute between Canada and the US over the legal status of the waterway – an issue that was a largely redundant one whilst the Passage was effectively impassable."[267]

aa) U.S. View: Northwest Passage as International Strait

While Canada has claimed sovereignty over the Arctic Archipelago and its waters for more than 100 years,[268] the United States has constantly refused to recognise complete Canadian sovereignty over this region.[269] Instead, the U.S. assert that the Northwest Passage constitutes an international strait.[270] If that was the case, the

Zeitschrift für ausländisches öffentliches Recht und Völkerrecht 68, no. 3 (2008) 651–688, at 684; Rayfuse states that "[t]he weight of academic opinion appears currently to reject this proposition", see *id*., *supra* note 261, at 210.

[266] See Rothwell, *supra* note 8, p. 192.

[267] Potts and Schofield, *supra* note 261, at 157.

[268] The first evidence of a Canadian claim to the land and waters north of continental Canada came in 1909 in an assertion by Senator Poirier, see Donald Rothwell, "The Canadian-U.S. Northwest Passage Dispute: A Reassessment," *Cornell International Law Journal* 26 (1993), 331–372, at 331.

[269] It should be mentioned that Canada and the US concluded a pragmatic agreement in January 1988, which applies to icebreakers. Agreement on Arctic Cooperation, Canada and United States of America, signed at Ottawa on 11 January 1988, available at: http://untreaty.un.org/unts/60001_120000/30/4/00058175.pdf, last visited 18 May 2010; the agreement was expressly without prejudice to either state's position on the status of the Northwest Passage and it was laid down that the US seek Canada's consent prior to any transit through it.

[270] Matthew Carnaghan/Allison Goody, Canadian Arctic Sovereignty, Political and Social Affairs Division, Parliamentary Information and Research Service, Library of Parliament, PRB 05-61E, 26 January 2006, at p. 3, available at: http://www2.parl.gc.ca/content/lop/researchpublications/prb0561-e.pdf, last visited 26 March 2012.

regime of transit passage would prevail, under which the coastal state generally has very limited legislative competence.[271]

UNCLOS does not contain a definition of an international strait. The existing customary law concerning international straits was confirmed by the International Court of Justice in the *Corfu Channel Case* of 1949,[272] where the Court stated that an international strait had to meet two criteria, one geographic and one functional. Geographically, the strait must join one part of the high seas or an EEZ and another part of the high seas or an EEZ.[273] The functional criterion addresses the use of the strait for international navigation.[274]

Considered as one single strait, the Northwest Passage connects two parts of the high seas or EEZs[275] and accordingly complies with the first criterion.

The fulfilment of the second standard, to the contrary, cannot be determined easily because its precise meaning has been quite controversial. The critical issue is "whether an international strait is one that *has been used* by foreign vessels (actual use) or, on the other hand, that merely *could be used* by foreign vessels (potential use)."[276] Both Article 16(4) of the Geneva Convention and Articles 34(1) and 37 of UNCLOS simply refer to "straits used for international navigation".

The use of the past tense could indicate the requirement of actual use. The respective provisions in the Conventions and the Court in the Corfu Channel case employ the phrase "straits *used* for international navigation".[277]

Most scholars seem to adopt the view that the qualification of an international strait requires the functional criterion of actual use for international navigation.[278]

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[271] Churchill and Lowe, *supra* note 244, p. 347.

[272] Corfu Channel Case, Judgement of April 9th, 1949, I.C.J. Reports 1949, p. 4.

[273] Article 37 UNCLOS.

[274] Corfu Channel Case, *supra* note 272, p. 28.

[275] Mahealani Krafft, "The Northwest Passage: Analysis of the Legal Status and Implications of its Potential Use," *Journal of Maritime Law & Commerce* 40, no. 4 (2009), 537–578, at 566.

[276] Suzanne Lalonde, "Increased traffic through Canadian Arctic waters: Canada's state of readiness," *Revue Juridique Thémis* 38, no. 1 (2004): 49–124, at 86.

[277] See R. D. Brubaker, "Straits in the Russian Arctic," *Ocean Development & International Law* 32 (2001), 263–287, at 267. Kraska challenges the existence of any other criteria apart from the geographic requirement. He denies that UNCLOS contains any allusion to a functional prerequisite and concludes that this requirement consequently cannot rely on any authority, James Kraska, "The Law of the Sea Convention and the Northwest Passage," *International Journal of Marine and Coastal Law* 22, no. 2 (2007) 257–282, at 275. With regard to the above cited phrase "straits used for international navigation", this reasoning is not convincing. What should the wording of the law allude to if not the required use of the strait?

[278] See e.g. Tommy B. Koh, "The territorial sea, contiguous zone and straits and archipelagos under the 1982 Convention on the Law of the Sea," *Malaya Law Review* 29 (1987), 163–199, at 178; Howson, "Breaking the ice", *supra* note 234, at 370; Christopher M. MacNeil, "The Northwest Passage: Sovereign seaway or international strait? A reassessment of the legal status," *Dalhousie Journal of Legal Studies* 15 (2006), 204–240, at 232, and citations by Pharand, *supra* note 262, at 35.

However, the functional criterion laid down in the *Corfu Channel Case* and in UNCLOS, is very ambiguous. It remains unclear whether a minimum number of transits is necessary to satisfy this element. The Court stated in the *Corfu Channel Case*: "It may be asked whether the test is to be found in the volume of traffic passing through the Strait or in its greater or lesser importance for international navigation. But in the opinion of the Court the decisive criterion is rather its geographical situation as connecting two parts of the high seas and the fact of it being used for international navigation."[279] The use for international navigation was determined on the basis of the number of ships that traversed the Corfu Channel and the number of different flags under which the ships sailed.

As the relevant conventions contain no specification regarding the definition of international use of a strait, the criteria developed by the Court are still applicable today.[280] Assessing the Northwest Passage with regard to these standards, it has to be noted, that there have been only 69 completed transits by non-Canadian ships through the passage in the history of its use (1903–2005).[281] The Court did not determine a minimum number of transits or flags required, though. Therefore, it remains unclear, whether any use by international traffic is sufficient.

Pharand adopts the view that the functional criterion requires a "history as a useful route for international maritime traffic",[282] which he negates with respect to the Northwest Passage—"[g]iven the control exercised by Canada over those foreign transits, and considering the small number of commercial ships involved".[283] Yet these preconditions have neither been postulated by the Court in the *Corfu Channel Case* nor by the relevant conventions. However, construing the conventions in the light of the customary law as embodied in the Court's ruling, indicates that a handful of transits—almost all of them consented by Canada—are not sufficient to establish an international strait.

It has been suggested by *Rothwell* that in Polar Regions, where seaways are blocked by sea-ice for a considerable time, the standard regarding the amount of traffic needs to be lowered.[284] Nonetheless, less than one completed transit per year can hardly be deemed sufficient to qualify a strait "used for international navigation" without completely invalidating the functional criterion.[285]

All in all, it seems more convincing to reject the US assertion that the Northwest Passage constitutes an international strait under international law. In the next section, it

[279] Corfu Channel case, *supra* note 272, p. 28.

[280] Donat Pharand, *Canada's Arctic waters in international law* (Cambridge: Cambridge University Press, 1988), p. 224; *id.*, *supra* note 262, at 36.

[281] Pharand, *Canada's Arctic waters in international law*, *supra* note 280, p. 224.

[282] *Id*, *supra* note 262, at 42.

[283] *Ibid.*

[284] Rothwell, *supra* note 268, at 355; it has already been recognised by the Permanent Court of International Justice that the application of general principles of law to the Arctic regions must take into account special local conditions, such as the difficult accessibility of the region, *Eastern Greenland Case*, 1933, P:C:I:J. Rep., Ser. A/B, no. 53.

[285] MacNeil, *supra* note 278, at 233.

will be examined whether the Canadian point of view—that the waters of its archipelago, and especially those of the Northwest Passage, are internal waters—is more persuasive.

bb) Canadian View: Internal waters

As seen above, Canada has continuously claimed sovereignty over the land and waters north of continental Canada. While Canada's view concerning the status of the water has been challenged by the U.S., sovereignty over the islands of the Arctic Archipelago is not an issue. Canada's title over the islands, resulting from the assignment by Britain in 1880, has been uncontested since Denmark abandoned its claim to Ellesmere Island in 1920 and Norway its claim to the Sverdrup Islands in 1928–1930.[286] One exception exists in Canada's dispute with Denmark over Hans Island, where only a fragment of land and surrounding seabed are at stake.[287]

The modern disagreement between Canada and the United States over the Northwest Passage crystallised around the voyage of the *SS Manhattan*, which made the transit accompanied by two U.S. Coast Guard icebreakers, without seeking prior permission from Canada.[288]

Until the occurrence of the *SS Manhattan* navigation, there had been no formal assertion of Canadian sovereignty over the waters of the Northwest Passage or the Arctic Archipelago, apart from the proclamation of a 3-mile territorial sea around the islands of the Archipelago. In consequence, the *SS Manhattan* was passing through high seas during its navigation of the Passage, a part of the narrow Prince of Wales Strait, where Canadian territorial waters overlapped.[289]

In reaction to this incident, Canada started three legal initiatives.[290] Firstly, it enacted the *Arctic Waters Pollution Prevention Act* (*AWPP*)[291] that extended Canadian jurisdiction 100 nm from the low-water mark so as to enforce certain pollution standards on vessels using Canada's Arctic waters. Secondly, Canada extended the territorial sea from 3 to 12 nautical miles.[292] Thirdly, Canada withdrew its acceptance of the compulsory jurisdiction of the International Court of Justice,[293] conscious about the controversy regarding the accordance of the *AWPP* with international principles and instruments.[294]

[286] Byers and Lalonde, *supra* note 245.

[287] *Id.*, "Our Arctic sovereignty is on thin ice", Liu Institute for Global Issues, 1 August 2005, available at: http://www.ligi.ubc.ca/?p2=/modules/liu/publications/view.jsp&id=1886, last visited 26 March 2012.

[288] See Kraska, *supra* note 277, at 263.

[289] Donat Pharand, *The law of the sea of the Arctic*: *With special reference to Canada*, Collection des travaux (Ottawa: Univ. of Ottawa Press, 1973), at 57.

[290] Rothwell, *supra* note 8, p. 193.

[291] *Supra* note 235. Arctic Waters Pollution Prevention Act, SC 1970, c. 47.

[292] Act to amend the Territorial Sea and Fishing Zones Act, SC 1970, c. 48.

[293] Canadian Declaration Concerning the Compulsory Jurisdiction of the International Court of Justice, 7 April 1970, reprinted in (1970) 9 I.L.M. 598.

[294] See for the U.S. point of view Lalonde, *supra* note 276, at 62.

The legal dispute between Canada and the US arose again in August 1985 when the US Coastguard icebreaker *Polar Sea* traversed the Northwest Passage without asking for Canada's permission.[295] Having been informed by the United States prior to the passage, Canada explained that it considered the waters of the Archipelago,[296] including those of the Northwest Passage, internal waters and that prior request for authorisation was therefore necessary.

On September 10, 1985, the Canadian Secretary of State for External Affairs, *Joe Clark*, stated in the House of Commons that

> Canada's sovereignty in the Arctic is indivisible. It embraces land, sea, and ice. It extends without interruption to the seaward-facing coasts of the Arctic islands. These islands are joined and not divided by the waters between them. They are bridged for most of the year by ice. From time immemorial Canada's Inuit people have used and occupied the ice as they have used and occupied the land. The policy of this government is to maintain the natural unity of the Canadian Arctic archipelago, and to preserve Canada's sovereignty over land, sea, and ice undiminished and undivided.[297]

Clark declared that an order in council establishing straight baselines around the islands of the Arctic Archipelago had been signed and that "[t]hese baselines define the outer limit of Canada's historic internal waters".[298]

If the waters of the Northwest Passage are internal, then Canada, as the coastal state, is the only country with automatic rights to navigate the Northwest Passage, because it has the right to exercise full sovereignty over the Passage.[299] The status of internal waters can result from either the acquisition of a historic title or the establishment of straight baselines. The following section examines whether the straight baselines drawn around the Arctic Archipelago are valid under international law.

(1) Straight Baselines as a Basis for Internal Waters

The straight baseline method allows a country with offshore islands and/or very jagged coastlines to calculate its territorial seas from straight lines drawn from a point on the coast to the islands, or from island to island,[300] instead of along the sinuosities of the coast.

The method of delimitation was developed by Norway from 1812 forward, approved by the International Court of Justice in 1951, incorporated in the Territorial Sea Convention of 1958, and retained in UNCLOS.[301]

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[295] Pharand, *supra* note 262, at 4.

[296] Despite the nomenclature, Canada, correctly, does not assert the archipelago to be 'an archipelago' in terms of Part IV UNCLOS.

[297] Canada: Statement concerning Arctic Sovereignty, September 10, 1985, 24 International Legal Materials (1985), 1723–1728, at 1725.

[298] *Ibid.*; Territorial Sea Geographical Coordinates (Area 7) Order, S.O.R./85-872.

[299] MacNeil, *supra* note 278, at 209.

[300] Pharand, Canada's Arctic waters in international law, *supra* note 280, at 131.

[301] *Id.*, "The legal régime of the Arctic: some outstanding issues," *International Journal of Legal Information* 39 (1983–1984), 742–799, at 769.

In the 1951 Anglo-Norwegian *Fisheries Case*,[302] the International Court of Justice held that under specific conditions, international law permitted a coastal state to draw straight baselines from which its territorial sea could be measured. These baselines would establish the outer boundary of internal waters over which full sovereignty could be exercised.[303] The Court opined that the method of drawing straight baselines would only be consistent with international law "where a coast is deeply indented and cut into [...] or where it is bordered by an Archipelago." The Court then laid down three requirements necessary to establish straight baselines: These must not depart to any appreciable extent from the general direction of the coastline (1), the waters lying within the baselines must be closely linked to the coastal state's domain as to be considered internal waters (2) and the waters must represent economic interests which are particular to the region and which have an importance evidenced by a long history of use (3).[304]

The criteria developed by the International Court of Justice in the *Fisheries Case* were later laid down in Article 5 of the 1958 *Territorial Sea Convention*[305] and in Article 7 UNCLOS. Article 7(3) UNCLOS provides that the drawing of straight baselines must not depart to any appreciable extent from the general direction of the coast, and that the sea areas lying within the lines must be sufficiently closely linked to the land domain to be subject to the regime of internal waters. Paragraph 5 of the same Article contains the provision that account may be taken, in determining particular baselines, of economic interests peculiar to the region concerned, the reality and the importance of which must be clearly evidenced by long usage.

However, the general UNCLOS rule as to where the method of straight baselines is applicable differs considerably from the principle laid down in the *Fisheries Case*: Article 7(1) UNCLOS requires a "coastline [that] is deeply indented and cut into, or [...] a fringe of islands along the coast in its immediate vicinity". In contrast, the Court only requested an Archipelago (such as the 'skjaergaard'). Thus, the UNCLOS standard is more precise and therefore, much stricter than the Court's ruling.[306] The difference concerns two aspects: the degree of proximity of the islands to the coast and the configuration of the group of islands.[307]

To apply these criteria to the Canadian Arctic Archipelago, one has to consider the geographic character of that area. The Arctic Archipelago stretches some 3,000 km along the mainland coast of Canada. It is the largest group of islands in the world, with 73 major islands, among them 6 of the world's 30 largest islands, and some 18,114 smaller ones. Together with their intervening waters, the islands

[302] Fisheries case, Judgement of December 18th, 1951: I.C. J. Reports 1951, p. 116.

[303] Lalonde, *supra* note 276, at 68.

[304] Fisheries Case, *supra* note 302.

[305] Convention on the Territorial Sea and Contiguous Zone, 29 April 1958, 516 U.N.T.S. 205.

[306] J. B. McKinnon, "Arctic Baselines: A litore usque ad litus," *The Canadian Bar Review* 66 (1987), 790–817, at 804.

[307] Pharand, *supra* note 262, at 15.

cover 1.3 million km^2.[308] The Canadian baseline system begins in the West at the border with Alaska, continues around the outer perimeter of the Arctic Archipelago, and finally joins existing baselines in northern Labrador. Straight baselines were drawn around islands of the coastline of Newfoundland on November 8, 1967.[309]

Does this Archipelago constitute a deeply indented coastline or a fringe of islands in the immediate vicinity of the coast?

Much of the island coastline of the Arctic Archipelago is deeply indented and cut into, especially the coastlines of Banks Island and Ellesmere Island. The eastern coasts of the mountainous Ellesmere and Baffin Islands, with their deep inlets and fjords, are geographically very similar to the east coast of Finnmark, which was considered as meeting the geographical requirements for the drawing of straight baselines by the Court.[310] However, it can be questioned whether the first alternative applies to archipelagos at all.[311] *McKinnon* argues that the deeply indented northern mainland coast of Canada would only justify using straight baselines along the coast.[312]

Whether the islands of the Arctic Archipelago can be described as a "fringe of islands" in the "immediate vicinity" of the coast, is highly disputable. A "fringe" is a border or edging, especially one that is broken or serrated.[313] The term implies both proximity and density (or number) of islands.[314]

As the waters of the Archipelago are often frozen, some Canadian scholars have asserted that they are more like land than water, and thus that the "close link" requirement is almost certainly met. But as the latest developments have proven, it is quite unlikely that the ice conditions will remain stable. Therefore, this argument will probably no longer be valid. Moreover, with regard to the fact that the islands extend around 1,600 km north from the mainland, it is difficult to consider the islands as situated in the "immediate vicinity of the coast".[315]

The major impediment to compliance with this criterion is posed by the Parry Channel (constituted by McClure Strait, Viscount Melville Sound, Barrow Strait and Lancaster Sound), which divides the archipelago into two distinct island groups and thus disrupts the cohesiveness or coherence of the Canadian north.[316] Accordingly, even if the southern group of islands could be treated as a fringe of islands in

[308] *Ibid.*; Lalonde, *supra* note 276, at 53, footnote 1.

[309] Mark Killas, "The Legality of Canada's Claims to the Waters of its Arctic Archipelago," *Ottawa Law Review* 19 (1987), 95–136, at 103.

[310] *Ibid.*, at 109.

[311] John Byrne, "Canada and the legal status of ocean space in the Canadian Arctic Archipelago," *Faculty of Law Review* 28 (1970), 1–16, at 8.

[312] McKinnon, *supra* note 306, at 804.

[313] Lesley Brown, ed., *The new shorter Oxford English dictionary on historical principles*, Reprinted, with corrections. (Oxford: Clarendon Press, 1993).The shorter Oxford English Dictionary on historical principles, Vol. 1, 1977.

[314] Killas, *supra* note 309, at 112.

[315] McKinnon, *supra* note 306, at 805.

[316] Killas, *supra* note 309, at 114.

the immediate vicinity of the mainland, it would be more difficult to include the northern group.[317] But even if this objection could be overcome by a "global view" as suggested by *Pharand* and *Killas*,[318] the validity of the straight baselines established by Canada is still problematic with regard to the other criteria: The regional economic interests evidenced by long usage and no major departure from the general direction of the coast. Whereas the fulfilment of the first criterion can be justified, it is quite difficult to defend the accomplishment of the last requirement.

The regional economic interests in the Canadian Arctic, which must be evidenced by long usage, are based on the activities of the local Inuit populations, who have been fishing, hunting and trapping in the waters and on the sea ice of most of the Archipelago. This traditional hunting and trapping has been exercised and enjoyed by the Inuit since pre-historic times and is still vital to their economy today.[319] Therefore, Canada has a strong position in asserting a peculiar economic interest in the region.

Since the Arctic Archipelago is triangular-shaped, "the baselines necessarily depart from the more straightforward west to east direction of the mainland coast"[320] and accordingly do not conform to the Canadian coastline when viewed as a whole. To defend the Canadian baselines system, *Killas* brings forward the argument that the Canadian coastline is so varied with indentations and peninsulas that no general direction of the coastline can be ascertained.[321] However, it is difficult to deny that the northern coast of Canada runs in a general east–west direction, whereas the Archipelago appears to project itself in a general northerly direction.

Killas furthermore holds that "Canada could exploit the inherent ambiguity of the word 'coastline' [. . .] which can be taken to mean the coastline of the islands themselves."[322] *Pharand* adopts a similar view when he states: "what really constitutes the Canadian coastline is the outer line of the Archipelago".[323] While this approach might comply with the requirements laid down in the *Fisheries Case*, they hardly comply with the conventions. As *McKinnon* points out, the reference to "coast" in Article 4(2) of the *Territorial Sea Convention* can only refer back to the "coast" in Article 4(1), which is clearly the mainland coast.[324] A similar reasoning can be applied to Article 7(3) UNCLOS: Article 7(1) UNCLOS lists a deeply indented coastline as the first alternative and a fringe of islands as a second alternative. Therefore, it is plausible that Article 7(3) UNCLOS is referring to the

[317] McKinnon, *supra* note 306, at 804.

[318] Pharand, *supra* note 301, at 779; Killas, *supra* note 309, at 114.

[319] Pharand, Canada's Arctic waters in international law, *supra* note 280, at 164.

[320] Killas, *supra* note 309, at 117.

[321] *Ibid*., at 118.

[322] *Ibid*., at 110.

[323] Pharand, *Canada's Arctic waters in international law*, *supra* note 280, at 162–163; *id*., *supra* note 301, at 781.

[324] McKinnon, *supra* note 306, at 805.

mainland coastline described in Article 7(1), when using the word coastline. Otherwise, the provision would have been worded to allude to the inclusion of the islands' coastline.

Recently, *Pharand* has suggested a different approach to defend the compliance of Canadian baselines with the general direction of the coast. He proposes using a "map with fewer distortions, as one moves away from the equator, than does a conic projection".[325] Referring to a world map published by the National Geographic Society in 1988, that according to Pharand largely solved the distortion problem he claims, by projecting the Polar Regions in a far more realistic manner. That map displays the Archipelago as being fully integrated to the mainland, oriented east and west in the same general direction.[326] But does the presentation of this world map really comply with the true geographical situation of the Arctic Archipelago? Does the island formation indeed correspond to the general direction of the Canadian mainland coast?

However, these questions may remain unanswered, if a right of innocent passage regarding the Northwest Passage continues to exist despite valid baselines drawn by Canada.

(2) Right of Innocent Passage

If the straight baselines established in the Canadian Arctic have the effect of enclosing internal water areas that had not previously been considered as such, the international community retains the right of innocent passage through those waters, Article 8(2), 35(a) UNCLOS. The crucial question might therefore be whether the Arctic waters enclosed by the established straight baselines constituted internal waters before the baselines were drawn.

It has to be kept in mind, however, that Canada was not a party to UNCLOS when it drew straight baselines. It could be argued that the status of the waters enclosed by the baselines has to be measured at the time of the drawing of the baselines, not at the later date when Canada became a party to the Convention. Since there was no customary international law rule with regard to the content of Articles 8 and 35 UNCLOS when Canada drew the baselines, the waters enclosed by straight baselines are not affected.[327]

Some commentators remain unconvinced. They hold that this approach would result in all the excessive maritime claims of the pre-UNCLOS 1982 period being permissible as well, which would in turn lead to a "global crazy quilt of conflicting maritime claims"[328] and thereby threaten the success of UNCLOS as a package deal.

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[325] Pharand, *supra* note 262, at 18.

[326] *Ibid*., at 19–20.

[327] Donald McRae, "Arctic Sovereignty? What is at Stake?," *Behind the Headlines* 64, no. 1 (January 2007), at 13.

[328] Kraska, *supra* note 277, at 272.

The question of whether Canadian Arctic waters are affected by the relevant UNCLOS provisions can again be left open, however, if these waters had been considered internal waters based on a historic title, before the baselines have been drawn—which is Canada's recently affirmed official position.[329]

(3) Historic Title as a Basis for Internal Waters

The doctrine of historic waters developed from that of historic bays which emerged during the nineteenth century for the protection of certain economically and security relevant large bays closely linked to the surrounding land area and traditionally considered by claiming states as part of their national territory.[330] The nature of historic waters was never codified in any convention, but the general criteria for the establishment of historic title were identified in the 1962 U.N. Secretariat study "Juridical regime of historic waters, including historic bays".[331]

For a valid claim of title to waters on historic grounds, a state is required to effectively exercise exclusive authority over the maritime area claimed for a considerable period of time. Additionally, the claim must have received the acquiescence of other states, especially those directly affected by the claim.[332]

As evidence of the exercise of authority over the area in question, Canada cites the fact that the archipelago had been mapped by British explorers before the title transfer in 1880, and explored and patrolled by Canada after this date.[333] The nation claims that it has manifested its authority and control over the waters of the Arctic Archipelago through the exercise of legislative, administrative and judicial jurisdiction, such as the whale hunting legislation in 1905, the creation of the Arctic Islands Preserve in 1926, the regulation of fur trade, licensing of explorers and marriages, the collection of customs duties and judicial jurisdiction over acts committed on the Arctic ice beyond the 3 mile territorial sea,[334] and that it has done so for a long period of time.[335] Additionally, Canada puts forward that the few passages that have taken place in the past have almost all been exercised with previous consent of the Canadian government and could thus be seen as a proof of recognition of Canadian sovereignty.

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[329] Rising to the Arctic challenge: Report on the Canadian Coastguard, Second Report of the Standing Senate Committee on Fisheries and Oceans, May 4, 2009, available at: http://www.parl.gc.ca/40/2/parlbus/commbus/senate/Com-e/fish-e/rep-e/rep02may09-e.pdf.

[330] Pharand, Canada's Arctic waters in international law, *supra* note 280, at 91.

[331] Yearbook of the International Law Commission 1962, vol. 2, at 1–26.

[332] Lalonde, *supra* note 276, at 77.

[333] Pharand, Canada's Arctic waters in international law, *supra* note 280, p. 173.

[334] See Ivan L. Head, "Canadian claims to territorial sovereignty in the Arctic regions," *McGill Law Journal* 9 (1963) 200–226; Howson, "Breaking the ice", *supra* note 234, at 364, note 126.

[335] Pharand, Canada's Arctic waters in international law, *supra* note 280, p. 173.

However, Canada's position could be weakened by its "own inconsistent actions and pronouncements regarding the Arctic waters and the Northwest Passage since the 1950s".[336] Even given that Canada has in fact effectively exercised its exclusive sovereignty, it would still have to meet the "acquiescence" criterion. Persistent objections by the United States, e.g. the diplomatic note entitled "U.S. Opposes Unilateral Extension by Canada of High Seas Jurisdiction"[337] and protest by other foreign governments concerning Canada's Arctic policy[338] as well as the unwelcome transit of the *Polar Sea* and Canada's inability to properly monitor American and Russian submarine traffic, raise serious doubts as to whether the Arctic waters were previously considered as internal waters.[339]

All in all, the Canadian claim to the waters of the Arctic Archipelago—and therefore to the waters of the Northwest Passage—cannot be deemed valid under international law.[340] In consequence, the waters of the Arctic Archipelago have not been considered as Canadian internal waters prior to the drawing of straight baselines by Canada. From this it follows that the right of innocent passage continues to exist in these waters, Article 8(2) UNCLOS.

cc) Possible Internationalisation of the Northwest Passage

Given the shrinkage and thinning of sea ice, the technical improvement in ship-building and the considerable economic advantage of a navigable Northwest Passage, it seems to be just a matter of time until traffic through the Arctic Archipelago grows to the amount that would satisfy the criteria of an international strait under UNCLOS.[341]

Irrespective of the legal regime currently governing the waters of the Canadian archipelago, Canada cannot bar shipping through the Northwest Passage completely—nor does it seem to have that intention.[342] The Canadian government

[336] Lalonde, *supra* note 276, at 74.

[337] Cited in N.D Bankes, "Forty Years of Canadian Sovereignty Assertion in the Arctic, 1947–87," *Arctic and Alpine Research* 40, no. 4 (1987), 285–291, at 287.

[338] See Byers and Lalonde, *supra* note 245, p. 1151, note 104.

[339] Howson, "Breaking the ice", *supra* note 234, at 365.

[340] Similarly Pharand, *Canada's Arctic waters in international law*, *supra* note 280, at 125; McKinnon, *supra* note 306, at 801; Rothwell, *supra* note 268, at 359; Howson, "Breaking the ice", *supra* note 234, at 365.

[341] See Donat Pharand, *The Northwest Passage*: *Arctic straits*, International straits of the world (Dordrecht: Nijhoff, 1984), at 110: "It would seem that the only uncertainty is the time at which this would take place, which depends on the intensity of the use.".

[342] In his 1985 Arctic Statement Clark stated: "The policy of the Government is also to encourage the development of the navigation in Canadian Arctic waters. Our goal is to make the Northwest Passage a reality for Canadians and foreign shipping as a Canadian waterway. [. . .] Navigation, however, will be subject to the controls and other measures required for Canada's security, for the preservation of the environment, and for the welfare of the Inuit and other inhabitants of the Canadian Arctic. "House of Commons Debates, 10 September 1985, at 6463.

has always held the point of view that the Arctic waters should be open to international shipping but with Canada as manager or caretaker.[343]

Should the Northwest Passage transform into an international strait, Canada as the coastal state bordering the strait would usually retain only very limited powers over foreign ships because of their right to transit passage.[344]

However, as discussed above, Article 234 UNCLOS as special provision regarding ice-covered waters applies also to international straits since its application is not excluded from "straits used for international navigation", Article 233 UNCLOS.[345] As Article 234 UNCLOS applies to the Northwest Passage, the regime for transit passage is consequently not applicable to it and Canada as the coastal state bordering the strait retains the right to adopt non-discriminatory pollution regulations as provided for in the provision,[346] whether the Passage converts into an international strait or not.[347]

h) The Northern Sea Route

Russia claims most of the Russian Arctic straits as internal waters enclosed by straight baselines established under the 1985 Soviet Legislation on Straight Baselines.[348]

These enclose *inter alia* three straits in the Novaya Zemlya Archipelago, four straits in the Severnaya Zemlya Archipelago and three straits in the Novosibirskiye Ostrova Archipelago.[349]

As with the Canadian Arctic regime, the United States has objected to the Russian provisions governing straight baselines, straits, the territorial sea, and historic waters.[350] Therefore, as with to the Canadian case, the Russian claim of a historic title appears weak due to the lack of U.S. acquiescence.[351]

According to its view regarding the Northwest Passage, the U.S. claims the Northern Sea Route to be an international strait. When the United States sent two

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[343] *Ibid.*

[344] Article 37 UNCLOS.

[345] See Pharand, *supra* note 262, at 46 and Rothwell, *supra* note 268, at 370.

[346] Canada has made use of its competence with the AWPPA, *supra* note 235.

[347] McRae, *supra* note 234, at 110; Kristin Bartenstein, "The "Arctic Exception" in the Law of the Sea Convention: A Contribution to Safer Navigation in the Northwest Passage?," *Ocean Development & International Law* 42, 1–2 (2011), at 34.

[348] Soviet Legislation on Straight Baselines, 15 January 1985, reprinted in William E. Butler, *The USSR, eastern Europe and the development of the law of the sea* (London: Oceana Publ., 1983), pp. 1–2, and 21–56.

[349] R. D. Brubaker, "The legal status of the Russian baselines in the Arctic," *Ocean Development & International Law* 30, no. 3 (1999), 191–233, at 209.

[350] J. A. Roach and Robert W. Smith, *United States responses to excessive maritime claims*, 2nd ed., Publications on ocean development (The Hague: Kluwer Law International, 1996).

[351] See Brubaker, *supra* note 277, at 266.

icebreakers in 1967, however, the Soviet Union refused to allow the vessels to proceed and threatened to use military force against them.[352] After this incident, the Soviet Government stated that any future efforts to transit the Northern Sea Route without their explicit permission would be met with force. Another reaction was the intensification of efforts to develop the use of the Northern Sea Route as a means of shipping goods along its northern territories.[353] Just as for the Canadian Passage, the Northern Sea Route is not held to constitute an international strait yet, but may become one as it develops into a commercially viable passage.[354]

The considerations made with regard to the legal regime governing the Northwest Passage apply to the Northern Sea Route respectively. From this it follows that the right of transit passage principally governs the Northern Sea Route, even if it constitutes no international strait (yet), but that Article 234 UNCLOS in the area applies to prevent the application of the transit regime. Therefore, no analysis of the validity of the Russian internal waters regime is undertaken here.

2 Regulation of Certain Areas of the Marine Arctic

Consistent with UNCLOS, treaties adopting both ecosystem and single-species approaches regulate certain specific geographical segments of the Arctic marine area. These treaties represent the first type of Conventions that will be used as an example and include e.g. the Agreement on Cooperation in Research, Conservation and Management of Marine Mammals in the North Atlantic (NAMMCO-Agreement)[355]). The example given here is the OSPAR Convention.[356] The reason for this choice is that firstly this agreement is the only comprehensive treaty regulating most environment-relevant human activities for a certain area of the marine Arctic. Secondly, at the point of time of entering into force, the OSPAR Convention represented an example of a new generation of regional conventions. With its pioneering provisions on protection of the marine environment, it is thought to provide a model "for creating an innovative system of pollution control for a specific region".[357] In fact, as can be seen with respect to high seas MPAs, the OSPAR Convention continues to adopt novel approaches.

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[352] Huebert, *supra* note 79, at 204.

[353] Leonid Timchenko, "The Northern Sea Route: Russian management and Jurisdiction over Navigation in Arctic Seas," in *The law of the sea and polar maritime delimitation and jurisdiction*, *supra* note 74.

[354] Brubaker, *supra* note 277.

[355] Louise de La Fayette, "The OSPAR Convention comes into force," *International Journal of Marine and Coastal Law* 14 (1999), 247–297, at 250.

[356] Convention for the Protection of the Marine Environment of the North-East Atlantic, concluded 22 September 1992, entered into force 25 March 1998, 2354 UNTS 67.

[357] Huebert and Yeager, *supra* note 2, p. 28.

a) OSPAR Convention

aa) Introduction

The OSPAR Convention[358] provides the framework for international cooperation for protection of the marine environment of the North-East Atlantic.[359] It entered into force on 25 March 1998[360] and replaced,[361] enhanced and modernised both the 1972 Oslo Convention for the North-East Atlantic[362] and the 1974 Paris Convention on Pollution of the North Sea and Adjacent Areas from Land-Based Sources.[363] Its objective was to frame a comprehensive regime in a single legal instrument "to prevent and eliminate marine pollution and to achieve sustainable management of the maritime area, that is, the management of human activities in such a manner that the marine ecosystem will continue to sustain the legitimate uses of the sea and will continue to meet the needs of present and future generations".[364] The maritime area referred to consists of the north-east Atlantic and parts of the Arctic Ocean.[365]

Originally designed as a treaty for pollution prevention and elimination, the OSPAR Convention of today can be described as a "Convention for the Protection

[358] Convention for the Protection of the Marine Environment of the North-East Atlantic, concluded 22 September 1992, entered into force 25 March 1998, 2354 UNTS 67.

[359] See de La Fayette, *supra* note 355, at 247.

[360] Apart from Annex V, which entered into force 30 August 2000. Available at: http://www.ospar.org/html_documents/ospar/html/ospar_convention_e_updated_text_2007_annex_v.pdf, last visited 30 March 2012.

[361] The decisions, recommendations and other agreements adopted under the two precursory Conventions continue to be applicable under the OSPAR Convention until they are terminated, article 31(2) OSPAR Convention.

[362] First regional convention for the protection of the marine environment, see Rainer Lagoni, "Regional Protection of the Marine Environment in the Northeast Atlantic Under the OSPAR Convention of 1992," in *The Stockholm declaration and law of the marine environment*, ed. Myron H. Nordquist, John N. Moore and Said Mahmoudi, 183–204 (The Hague; New York: Kluwer Law International, 2003), at 183.

[363] *Ibid.*

[364] De La Fayette, *supra* note 355, p. 250.

[365] The Convention applies to the maritime area of "those parts of the Atlantic and Arctic Oceans and their dependent seas which lie north of 36° north latitude and between 42° west longitude and 51° east longitude", but excluding the Baltic and the Mediterranean Sea, and "that part of the Atlantic Ocean north of 59° north latitude and between 44° west longitude and 42° west longitude", article 1(a). "Maritime area" means the internal waters and the territorial seas as well as the EEZs of the Contracting Parties and the high seas, including the bed of all those waters and its sub-soil, *ibid*. However, the OSPAR Convention does not seem to apply to the waters "north of Greenland between 44° west longitude and 42° west longitude extending to the North Pole.", Koivurova and Molenaar, *supra* note 214, p. 15, note 39. While Article 1(a)(i) refers to the "Atlantic and Arctic Oceans", its paragraph 2 does not make such reference, mentioning only the Atlantic Ocean, which does not include the waters north of Greenland.

of the Marine Environment".[366] It contains a number of basic rules and principles that regulate all human activities, with the notable exception of fisheries management[367] and with some limitations for the regulation of maritime transport.[368] It includes a series of Annexes,[369] dealing with the prevention and elimination of pollution from land-based sources (Annex I), of pollution by dumping or incineration (Annex II), from offshore sources (Annex III), with the assessment of the quality of the marine environment (Annex IV) and with the protection and conservation of the ecosystems and biological diversity of the maritime area (Annex V). Furthermore, the Convention includes three accompanying Appendices, covering criteria for best available techniques (BAT) and best environmental practices (BEP) (Appendices I and II) and criteria to assess human activities' effects on ecosystems and biodiversity (Appendix III).

The work under OSPAR is guided by six strategies reaffirmed and updated in 2003, including the OSPAR Strategy on the Protection and Conservation of the Ecosystems and Biological Diversity of the Maritime Area, the OSPAR Strategy to Combat Eutrophication, the OSPAR Strategy with regard to Hazardous Substances, the OSPAR Strategy on Environmental Goals and Management Mechanisms for Offshore Activities, and the OSPAR Strategy with regard to Radioactive Substances and the Biological Diversity and Ecosystems Strategy.[370] Each strategy has its own Committee that supports the Commission and that is itself supported by Working Groups.[371]

[366] Rainer Lagoni, "Monitoring Compliance and Enforcement of Compliance through the OSPAR Commission," in *Marine issues*: *From a scientific*, *political and legal perspective*, ed. Peter Ehlers, Rüdiger Wolfrum and Elisabeth M. Borgese, 155–63 (The Hague: Kluwer Law International, 2002), at 157.

[367] Fisheries management issues are considered as being "appropriately regulated under international and regional agreements dealing specifically with such questions", preamble OSPAR Convention.

[368] Article 4 Annex V to the OSPAR Convention; see Koivurova and Molenaar, *supra* note 214, p. 16.

[369] Pursuant to Article 14, the "Annexes and Appendices form an integral part of the Convention".

[370] Strategies of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic, Chapter I (OSPAR Agreement 2003–21; Summary Record OSPAR 2003, OSPAR 03/17/1-E, Annex 31), available at: http://www.ospar.org/html_documents/ospar/html/Revised_OSPAR_Strategies_2003.pdf#nameddest=hazardous_substances, last visited 3 February 2011.

[371] OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, Terms of Reference of OSPAR Committees, OSPAR agreement 2001–4, available at: http://www.ospar.org/html_documents/ospar/html/01-04e_terms_of__reference.pdf, last visited 3 February 2011.

The Contracting parties to the Convention[372] cooperate through the OSPAR Commission.[373] Its main task is to supervise implementation of the Convention. The Commission must also assess the conditions of the maritime area and the effectiveness of the adopted measures, frame programmes and measures for the prevention and elimination of pollution and control these activities, and set up subsidiary bodies and define their terms of reference.

The Commission generally adopts decisions and recommendations by unanimous vote of the Contracting Parties. Decisions become binding after a period of 200 days for those parties who have voted for it and who have not indicated that they could not accept it within that time span.[374] Although this procedure is seen as providing for a high flexibility in further developing legislation under the Convention,[375] this 'opt-out' procedure bears the risk of imperfect validity and incomplete application of decisions. Recommendations have no binding force, article 13 (5) OSPAR Convention.

bb) General Principles

The OSPAR Convention was the first international treaty that explicitly adopted the precautionary principle,[376] "by virtue of which preventive measures are to be taken when there are reasonable grounds for concern that substances or energy introduced [. . .] into the marine environment may bring about hazards to human health, harm living resources and marine ecosystems, damage amenities or interfere with other legitimate uses of the sea, even when there is no conclusive evidence of a causal relationship between the inputs and the effects", Article 2(2)(a) OSPAR Convention.

This definition of pollution also makes the precautionary approach part of the general obligation in Article 2 OSPAR Convention: Pursuant to the first paragraph of this provision the Contracting Parties "shall [. . .] take all possible steps to prevent and eliminate pollution and shall take the necessary measures to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore

[372] Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the European Union. Notably, of the Arctic States, the Russian Federation is not party to the Convention.

[373] See Article 10 OSPAR Convention.

[374] Article 13(2) OSPAR Convention.

[375] Rainer Lagoni, "Das OSPAR-Übereinkommen von 1992 und der Schutz der Nordsee: Einwirkungen auf das deutsche Umweltrecht," in *Meeresumweltschutz für Nord- und Ostsee: Zum Zusammenspiel von Völkerrecht und nationalem Umweltrecht*, ed. Hans-Joachim Koch and Rainer Lagoni, 79–101 (Baden-Baden: Nomos Verlagsgesellschaft, 1996).

[376] Juliane Hilf, "The Convention for the Protection of the Marine Environment of the North-East Atlantic: New approaches to an old problem?," *Zeitschrift für ausländisches öffentliches Recht und Völkerrecht* (1995), 580–603, at 586.

marine areas which have been adversely affected." Pollution is defined as the introduction by man, directly or indirectly, of substances or energy into the maritime area which results, or is *likely to result*,[377] in hazards to human health, harm to living resources and marine ecosystems, damage to amenities or interference with other legitimate uses of the sea.[378]

In fulfilling their obligation under the OSPAR Convention, the Contracting parties must also apply the polluter pays principle in addition to the precautionary principle.[379] Moreover, they must adopt programs and measures, preferably containing an end-date, to define BAT and BEP using the criteria set out in Appendix 1, including clean technology where appropriate.[380]

Although the OSPAR Convention makes no explicit reference to it, the OSPAR Commission agreed to apply the ecosystem approach at the Joint Ministerial Meeting of the HELCOM and OSPAR Commissions held in 2003 in Bremen (Germany), where the "Statement towards an Ecosystem Approach to the Management of Human Activities"[381] was adopted. In the Statement, both Commissions defined the ecosystem approach as "the comprehensive integrated management of human activities based on the best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity".[382] A major step in applying the ecosystem approach was the adoption of Ecological Quality Objectives (EcoQOs). An EcoQO is defined as the desired level of an ecological quality (EcoQ), which in turn is described as "[a]n overall expression of the structure and function of the marine ecosystem taking into account the biological community and natural physiographic, geographic and climatic factors as well as physical and chemical conditions including those resulting from human activities."[383]

OSPAR developed the EcoQO system in collaboration with the International Council for the Exploration of the Sea (ICES) through a pilot project in the North

[377] This wording incorporates a precautionary element, see *ibid*., at 585.

[378] Article 1(d) OSPAR Convention, emphasis added.

[379] According to this principle, "the costs of pollution prevention, control and reduction measures are to be borne by the polluter", Article 2(2)(b) OSPAR Convention.

[380] See Article 2(3)(a) OSPAR Convention.

[381] Statement on the Ecosystem Approach to the Management of Human Activities, Towards an Ecosystem Approach to the Management of Human Activities, Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention), OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic, First Joint Ministerial Meeting of the Helsinki and OSPAR Commissions (JMM), Bremen: 25–26 June 2003, available at: http://www.ospar.org/content/content.asp?menu=00320109000066_000000_000000, last visited 9 February 2011.

[382] *Ibid*, para. 5.

[383] *Ibid*., Annex 3.

Sea on invitation of the Ministers of the Fifth North Sea Conference in 2002.[384] This system firstly identifies Ecological Quality Issues. These are "the fields in which it is appropriate to attempt to measure aspects of the general ecological quality of the marine ecosystem under consideration."[385] Secondly, one or more "ecological quality elements", i.e. the dimensions that are to be measured and the scales against which to measure them, are established. Lastly, the EcoQOs or the desired level of that dimension on that scale, are determined.

The implementation of the EcoQO system in the North Sea has to be appreciated as a means of applying the ecosystem approach to the management of human activities. It seems to be a useful tool to make the ecosystem approach operational—to measure the state of the marine environment against defined baselines. However, for a successful integration of environmental protection into all sectors,[386] much remains to be done. On the one hand, the OSPAR Commission has yet to apply the EcoQO system to the rest of the maritime area covered by the OSPAR Convention (apart from the North Sea). On the other hand, due to a lack of commitment from some Contracting Parties, progress in development and implementation of EcoQO has been slow,[387] due to insufficient financial and personal resources.[388]

The OSPAR Commission expressed doubts about the "usefulness of the original EcoQO system in the further development of EcoQOs"[389] in light of the EU Marine Strategy Framework Directive (MSFD)[390] that adopted an alternative approach by establishing Good Environmental Status (GES)[391] and its generic qualitative descriptors as its basis. The Commission considers accepting this system as its leading framework. It also wants to identify an overall plan with priority issues for each OSPAR Region. However, the slow progress in EcoQOs since 1992 indicate that lack of commitment will remain an issue.

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[384] Bergen Declaration, Fifth International Conference on the Protection of the North Sea, 20–21 March 2002, Bergen, Norway, § 4 vi; the OSPAR Commission also cooperates with other competent management authorities for the North-East Atlantic. It has agreed Memoranda of Understanding or Agreements of Cooperation with a number of relevant international organisations, including the North-East Atlantic Fisheries Commission (NEAFC) or the IMO, see.

[385] OSPAR Commission, Report on North Sea Pilot Project on Ecological Quality Objectives, 2006.

[386] Bergen Declaration, Fifth International Conference on the Protection of the North Sea, 20–21 March 2002, Bergen, Norway, § I 3 v.

[387] OSPAR Commission, Evaluation of the OSPAR system of Ecological Quality Objectives for the North Sea (update 2010), Biodiversity Series, London 2009, available at:. http://www.ospar.org/documents/dbase/publications/p00406_Evaluation_EcoQO_2010_update.pdf, last visited 15 August 2011.

[388] *Ibid.*

[389] *Ibid.*

[390] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), Official Journal of the European Union L 164/19, 25.6.2008.

[391] Development of indicators, with reference levels, targets and limits that will be required to apply the generic qualitative descriptors of GES for the MFSD at the (sub-)regional level.

b) Establishment of (High Seas) MPAs

Since the meeting of the OSPAR Commission at Sintra, Portugal, in 1998, the OSPAR Commission has been committed to establishing a network of MPAs as a means "to protect and conserve the biological diversity of the maritime area and its ecosystems".[392]

The commitment to establish a network of MPAs was reaffirmed at the aforementioned First Joint Ministerial Meeting of the Helsinki and OSPAR Commissions in 2003. It was agreed that "by 2010 a joint network of well-managed marine protected areas" should be completed.[393]

In Recommendation 2003/3, the OSPAR Commission defined MPA as "an area within the maritime area for which protective, conservation, restorative or precautionary measures, consistent with international law have been instituted for the purpose of protecting and conserving species, habitats, ecosystems or ecological processes of the marine environment."[394]

The Ministerial Meeting in 2010 adopted decisions establishing six MPAs in ABNJ and recommendations on their initial management.[395] As previously discussed, decisions are generally binding for the Parties to the OSPAR Convention.[396] However, naturally the OSPAR Commission cannot alter the rights and duties of non-contracting states that enjoy full high seas rights. In addition to the rights of non-parties, OSPAR also has to consider the competence of other international organisations in ABNJ.[397] Acknowledging this, OSPAR is working on intensifying collaboration between the individual organisations responsible for the management of different sectoral activities in ABNJ, for instance ISA, IMO or the North-East Atlantic Fisheries Organisation (NEAFC).[398] So far, no MPA has been

[392] OSPAR Commission, Ministerial Meeting of the OSPAR Commission, Sintra, 22–23 July 1998, Main Results.

[393] Declaration of the First Joint Ministerial Meeting of the Helsinki and OSPAR Commissions, Bremen, Germany, 25–26 June 2003.

[394] OSPAR Recommendation 2003/3 on a Network of Marine Protected Areas, Meeting of the OSPAR Commission, Bremen, 23–27 June 2003; the aims of the OSPAR MPA Network are to protect, conserve and restore species, habitats and ecological processes which have been adversely affected by human activities; to prevent degradation of, and damage to, species, habitats and ecological processes, following the precautionary principle; and to protect and conserve areas that best represent the range of species, habitats and ecological processes in the maritime area.

[395] OSPAR Commission, Ministerial Meeting of the OSPAR Commission, Bergen, 23–24 September 2010, para. 28, available at: http://www.ospar.org/html_documents/ospar/news/ospar_2010_bergen_statement.pdf, last visited 26 March 2012.

[396] See article 13 OSPAR Convention.

[397] Regarding the legal and institutional issues evoked by the establishment of MPAs in ABNJ, see *infra* V.1.b).

[398] This has been recognised by the OSPAR Commission, see 2003 Strategies of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic, Reference number: 2003–21, para. 4.4, available at: http://www.ospar.org/content/content.asp?menu=00120000000070_000000_000000, last visited 18 August 2011.

completely designated in ABNJ since areas that were thought to be beyond national jurisdiction turned out to be situated on the outer continental shelf of member states.[399] Therefore, it remains to be seen how successfully the MPAs in ABNJ will be managed. In any case, OSPAR deserves merit for its innovative efforts in establishing MPAs in ABNJ. If OSPAR continues to pursue its promising work in coordinating the work of various organisations with responsibilities in ABNJ, it might shape the role regional environmental organisations will play in the management of MPAs in ABNJ.[400]

3 Species-Specific Regulation

Conventions belonging to the second category of treaties applicable to the marine Arctic regulate specific parts of the Arctic marine ecosystems, i.e. single species or genera. Examples of this type of Conventions include the International Convention on the Regulation of Whaling (ICRW)[401] and the International Agreement for the Conservation of Polar Bears.[402]

a) 1973 Agreement on the Conservation of Polar Bears

The reasons for choosing the latter Agreement are twofold: First of all, most of the legal instruments governing the Arctic marine environment do not solely focus on the Arctic environment. The Polar Bear Agreement is one exception to this.[403] It was the first and for a long time the only region-wide "hard law" treaty specifically

[399] This was the case for the Rainbow hydrothermal vent field MPA, which was nominated by Portugal in 2006. It is actually located on the state's extended continental shelf, for more information see Marta C. Ribeiro, "The 'Rainbow': The First National Marine Protected Area Proposed Under the High Seas," *International Journal of Marine and Coastal Law* 25 (2010): 183–207.

[400] See Erik J. Molenaar and Alex G. Oude Elferink, "Marine protected areas in areas beyond national jurisdiction: The pioneering efforts under the OSPAR Convention," *Utrecht Law Review* 5, no. 1 (2009) 5–20, at 20.

[401] International Convention for the Regulation of Whaling, concluded 2 December 1946, entered into force 10 November 1948, 161 UNTS 72.

[402] Agreement on Conservation of Polar Bears, concluded 15 November 1973, entered into force 26 May 1976, 27 UST 3918; see Colette de Roo *et al*., *Environmental Governance in the Marine Arctic*, Background Paper, 4 September 2008, Arctic TRANSFORM, available at: http://www.arctic-transform.org/download/EnvGovBP.pdf (last visited 7 April 2010), p. 20 *et seqq*.; also falling into this category: Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), concluded 3 March 1973, entered into force 1 July 1975, 993 UNTS 243.

[403] French and Scott, "International legal implications of climate change for the polar regions", *supra* note 78, at 641.

created to address an Arctic problem.[404] Secondly, polar bears might be one of the first species to become extinct as a direct result of climate change by the end of this century.[405] Therefore, polar bears have turned into a symbol of the consequences of climate change[406] and received wide attention by media and the general public.

The Polar Bear Agreement was concluded by the five states with the biggest polar bear populations (Canada, Denmark, Norway, the former USSR and the USA) in 1973 and entered into force in 1976.[407]

This treaty, created at the peak of the Cold War, was the first environmental agreement concluded between western and eastern block Arctic states.[408] It was triggered by the growing concern over intensified hunting of polar bears, particularly during the 1960s.[409]

aa) Material Obligations

Under the agreement, parties are obliged to generally prohibit the taking of polar bears, including hunting, killing and capturing, Article I. Five exceptions are laid down in Article III: Contracting parties may allow the taking of polar bears for *bona fide* scientific and for conservation purposes, to prevent serious disturbances in the management of other living resources, by local people using traditional methods and exercising traditional rights, and wherever polar bears have or might have been subject to taking by traditional means by its nationals.[410]

According to Article II, parties have to take action to preserve the ecosystems of which the polar bears are part, with special attention to polar bear habitat, in particular denning areas, feeding areas, and migratory routes. This was an

[404] Melissa A. Verhaag, "It Is Not Too Late: The Need for a Comprehensive International Treaty to Protect the Arctic Environment," *Georgetown International Environmental Law Review* 15 (2002–2003) 555–580, at 566; in 2011, the Arctic states concluded the Arctic Search and Rescue Agreement, see *supra* note 114.

[405] Meeting of the Parties to the 1973 Agreement in the Conservation of Polar Bears: Outcome of Meeting (Meeting Report, 17–19 March 2009), available at: www.polarbearmeeting.org/content.ap?thisId=500038360, last visited 20 January 2011.

[406] Thor S. Larsen and Ian Stirling consider the polar bear as the symbol of the Arctic, *id*., The Agreement on the Conservation of Polar Bears – its History and Future, Rapportserie nr. 127, March 2009, Norsk Polarinstitutt/Norwegian Polar Institute, Tromsø, p. 5.

[407] Nigel Bankes, "Climate Change and the Regime for the Conservation of Polar Bears," in *Climate governance in the Arctic* (*supra* note 82), 351–382, at 355; *id*., "Has international law failed the polar bear?," in *Changes in the Arctic environment and the law of the sea*, *supra* note 3, 365–86, at 373.

[408] Stefan Norris, Lynn Rosentrater, Pål Martin Eid, Polar Bears at Risk, A WWF Status Report, WWF International Arctic Programme, Oslo, May 2002, p. 19.

[409] Pal Prestrud and Ian Stirling, "The International Polar Bear Agreement and the current status of polar bear conservation," *Aquatic Mammals* 20 (1994), 113–124, at 113.

[410] Donald C. Baur, "Reconciling Polar Bear Protection under United States Law and the International Agreement for the Conservation of Polar Bears," *Animal Law* 2 (1996), 9–100.

innovative feature for environmental treaties at its time because it identified the need to protect entire ecosystems to ensure conservation of key species.[411] In addition, the Polar Bear Agreement was one of the first treaties in international law that stipulated the duty that management be carried out in accordance with sound conservation practices[412] "based on the best available scientific data".[413]

Parties also have the obligation to prohibit the use of aircraft and large motorised vessels for the purpose of taking polar bears (Article IV) and to prohibit the export or import of polar bears or parts thereof taken in violation of the agreement (Article V). Each Contracting Party shall furthermore take action as appropriate to promote compliance with the provisions of the Agreement by nationals of States not party to it (Article VIII).

To give effect to the Agreement, the Contracting Parties shall enact and enforce such legislation and other measures as may be necessary, Article VI(1). Pursuant to the treaty's concept, "protection [of the polar bears] should be achieved through co-ordinated national measures taken by the States of the Arctic Region", see preamble.

bb) Procedural Obligations

The treaty also establishes several procedural duties. Article VII stipulates that parties have to conduct national research programmes, particularly on management and conservation of polar bears. Furthermore, they shall, as appropriate, coordinate this research, consult with other Parties on the management of migrating polar bear populations and exchange information on research and management programmes, research results and data on bears taken.

The Contracting Parties also have the obligation to continue consulting with one another with the object of giving further protection to polar bears, Article IX. This duty relates not only to protecting bears from being taken, but extends to the protective obligations referred to in Article II of the Agreement (protection of ecosystems and critical habitat components) as a minimum standard.[414]

Lastly, Article X(6) provides that consultations shall be conducted with a view to convening a meeting of representatives of the five Governments to consider the revision or amendment of the Agreement, if one of the Contracting Party's government so requests.

[411] See Bankes, *supra* note 407, at 379; Prestrud/Stirling, *supra* note 409.

[412] This duty is only relevant for those Contracting States that continue to permit harvesting of polar bears. In Norway and Russia, the taking of polar bears is completely prohibited. The USA and Denmark permit harvesting by indigenous peoples and Canada authorises both an indigenous harvest and trophy or conservation hunting, see Bankes, *supra* note 407, at 360.

[413] See Prestrud/Stirling, *supra* note 409, at 113.

[414] Bankes, *supra* note 407, at 360.

The Agreement does not stipulate a conference of the parties or another requirement for the parties to meet on a regular basis. In 1981, the five Contracting Parties met in Oslo, Norway,[415] mainly to take the decision to continue the Agreement in force.[416] Apart from this conference, no meeting of the parties took place until the United States in 2007

> convened a meeting of competent polar bear authorities in the polar bear Range States to provide an international forum to exchange information on polar bear research and management programs, and on the status of polar bear populations, and to consider recommendations for additional national or collective measures that the Range States may take to conserve the species.[417]

At that meeting, the range states agreed on meetings taking place biannually or otherwise as agreed to by the Parties.[418]

In 2009, Norway hosted a Meeting of the parties[419] with the objective of updating the conservation status of polar bears, reviewing implementation of the Agreement, identifying useful polar bear conservation strategies and discussing mechanisms for enhanced implementation of the Agreement.[420] The parties shared the view that the consequences of climate change are the greatest hazard for polar bear conservation and that successful climate change mitigation is thus the key for protection of the species.[421] A scientific report given at the conference revealed that polar bears will become extinct by the end of this century if climate change takes place at the projected rate.[422]

The parties agreed that management and reduction of the "other stressors on polar bears and their ecosystems, such as habitat destruction, harvesting, pollution and anthropogenic disturbance"[423] will be the primary response to mitigate the impacts of climate change. The parties further concurred in that the identification of key habitats and the establishment of protected areas are essential for polar bear conservation.[424] They also planned to establish a circumpolar plan of action to

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[415] See 1981 Consultative meeting of the Contracting Parties to the Agreement on the Conservation of Polar Bears, Oslo, 20–22 January 1981, Summary and conclusions, available at: http://www.polarbearmeeting.org, last visited 18 January 2011.

[416] Article X(5) prescribes that the Agreement "shall remain in force initially for a period of five years from its date of entry into force, and unless any Contracting Party during that period requests the termination of the Agreement at the end of that period. it shall continue in force thereafter."

[417] Polar Bear Range States Meeting Summary, 26–28 June, 2007, Shepherdstown, West Virginia, U.S.A., available at: http://pbsg.npolar.no/export/sites/pbsg/en/docs/PB-Sheph07-outcome.pdf, last visited 18 January 2011, p. 1.

[418] *Ibid.*, p. 4.

[419] Meeting of the parties to the 1973 Agreement on the Conservation of Polar Bears, *supra* note 405.

[420] *Ibid.*, p. 1.

[421] *Ibid.*, p. 1.

[422] *Ibid.*, p. 2.

[423] *Ibid.*

[424] *Ibid.*, p. 2,3.

coordinate national conservation and management strategies.[425] Despite reaching agreement on sensible measures and aims, parties' recognition of the Agreement is weakened considerably by the fact that it creates no legally binding obligations to the Parties.[426]

Although there have been no regular meetings of the parties to oversee the effective implementation until a few years ago, there has been some international oversight on this issue, provided by the Polar Bear Specialists Group (PBSG).[427] It was established by the International Union for Conservation of Nature (IUCN) after the first international meeting on polar bear conservation held in Fairbanks, Alaska in 1965, to internationally coordinate research and management of polar bears.[428] It was the PBSG that initiated and played a leading role in developing the Polar Bear Agreement. At the Meeting of the parties in 2009, the Contracting Parties agreed to ask the PBSG to serve as the scientific advisory group to the parties.

b) Evaluation

At the time of its creation, the Agreement was quite innovative, especially considering the adoption of the ecosystem-approach. By stipulating the duty to protect the ecosystem of which polar bears are part, the Agreement called for the conservation of the entire food web, including plankton, fish and seals. Also, habitat protection was already included in the provisions under the Agreement. However, the greatest concern with regard to polar bear habitats is climate change, which rapidly reduces and fragments the Arctic sea ice, which is the main habitat for both polar bears and their main prey.[429] Thus, the most important long-term threat for survival of polar bears as a species is climate change, which is not a subject of the Agreement. Mitigation measures such as the reduction of other stressors and area-based management could support conservation, but the provisions are too vague and implementation is uncertain.[430] Furthermore, the Agreement lacks an on-going mechanism for review and amendment as well as a financial mechanism.[431] Although the parties agreed to assess the effectiveness of the Agreement, it is doubtful that conservation and management measures—especially the

[425] *Ibid*., p. 4.

[426] *Ibid*., p. 7.

[427] See Bankes, *supra* note 407, at 375.

[428] See Larsen, Stirling, *supra* note 406, at 5.

[429] Meeting of the parties to the 1973 Agreement on the Conservation of Polar Bears, *supra* note 405, p. 7.

[430] See the soft wording of article VIII of the Agreement requiring states to "take action as appropriate to promote compliance" with the Agreement.

[431] David VanderZwaag, "International law and Arctic marine conservation and protection: A slushy, shifting seascape," *Georgetown International Environmental Law Review* 9, no. 2 (1997) 303–345, at 308.

establishment of MPAs and the coordinated action concerning shared population—are effectively implemented in the near future.

4 Sector-Specific Regulation

The last group of Conventions to be illustrated deals with the regulation of specific activities influencing the Arctic marine area like shipping, fishing, resource extraction, dumping or marine scientific research. The relevant Conventions include treaty regimes established under the IMO, such as the MARPOL 73/78[432] as well as the London Convention.[433]

As mentioned above, the activities likely to be of most concern in the marine Arctic are fishing, shipping, and oil and gas extraction. With regard to the last two activities, the Arctic-specific instruments will be examined along with the relevant global framework where applicable. The legal framework for fishing in the Arctic Region will be dealt with at a later point of this research.

a) Shipping

As shown above, intensified maritime traffic in the Arctic Region will result in considerable hazards. The AMSA 2009 Report has identified three key issues for Arctic states: the "on-going globali[s]ation of the Arctic through natural resource development and resulting destinational marine traffic; the arrival of the global maritime industry in the Arctic Ocean with Arctic voyages of large tankers, cruise ships and bulk carriers on regional and destinational voyages; and the as yet unresolved lack of international policies, in the form of maritime governance to meet this arrival."[434]

Due to the global character of Arctic shipping, international standards under the auspices of the IMO that reflect the uniqueness of marine operations in the Arctic are of crucial significance.

Most recent (legal) developments have taken place in the shipping-sector, to tackle several gaps within the regime, such as insufficient availability of navigational warning systems, the absence of a regional agreement on search and rescue and inadequate and disparate crew training. Ultimately, the eight Arctic States concluded the Arctic Search and Rescue Agreement, the World-Wide Navigational Warning System (WWNWS) has been expanded into Arctic waters and the International Convention on Standards of Training, Certification and Watchkeeping for

[432] International Convention for the Prevention of Pollution from Ships, see *supra* note 205.

[433] Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, see *supra* note 204.

[434] Arctic Marine Shipping Assessment 2009 Report, *supra* note 65, p. 97.

Seafarers has been amended in relation to personnel serving on board ships operating in polar waters.[435]

The arguably most important development in this sector is the development of a binding "Polar Code".

aa) From "Guidelines for Ships Operating in Arctic Ice-Covered Waters" to "Guidelines for Ships Operating in Polar Waters"

The *Exxon Valdez* oil pollution accident in Alaskan waters in 1989 gave the impetus for developing (uniform)[436] provisions within the IMO addressing additional demands on ship systems posed by the polar environment. Between 1993 and 1997, an Outside Working Group (OWG) of technical experts headed by Canada drafted rules for ships operating in polar waters.[437] In 1998, Canada submitted the 'International Code of Safety for Ships in Polar Waters' on behalf of the OWG to the IMO Sub-Committee on Ship Design and Equipment (DE).[438]

The draft Code was particularly criticised for its bipolar scope of application[439]: The Antarctic Treaty Consultative Party (ATCM) noted at its 22nd meeting in 1998 that the OWG "had been drawn from Northern Hemisphere maritime countries and, as a consequence, had not fully taken cognisance of the environmental, operational, legal and political differences between the Arctic and the Antarctic".[440] The ATCM

[435] Amendments to the Seafarers' Training, Certification and Watchkeeping (STCW) Code adopted by the 2010 Manila Conference, Part B (Recommended Guidance regarding Provisions of the STWC Convention and its annex), Chapter V (Guidance regarding special training requirements for personnel on certain types of ships), Section B-V/g (Guidance regarding training of masters and officers for ships operating in polar waters), IMO doc. STCW/CNF.2/DC/3, 24 June 2010.

[436] Domestic frameworks regulating ice-going vessels had already been developed before, above all by Russia and Canada, see Lawson W. Brigham, "The emerging International Polar navigation Code: bi-polar relevance?," in *Protecting the polar marine environment*, *supra* note 6, 244–62, at 247 *et seq*.

[437] The OWG took up its work after Germany had proposed to insert a rule into the SOLAS Convention stating that "Ships intended for service in polar waters should have suitable ice strengthening for polar conditions in accordance with the rules of a recognized classification society.", IMO, Marine Safety Committee 59/30/32, 12 April 1991.

[438] Øystein Jensen, The IMO Guidelines for Ships Operating in Arctic Ice-covered Waters, Fridtjof Nansens Insitutt Report 2/2007, p. 9.

[439] Scovazzi, Tullio, "Towards Guidelines of Antarctic Shipping: A Basis for Cooperation between the Antarctic Treaty Consultative Parties and the IMO." In: Vidas, Davor (ed.), *Implementing the Environmental Protection Regime for the Antarctic*, Kluwer Academic Publishers, Dordrecht 2000, 243 – 260, at 254; critique also related to potential duplication of the Protocol on Environmental Protection to the Antarctic Treaty caused by the designation of the Arctic and the Antarctic as 'special areas' under MARPOL and with regard to the required advance notification for ships entering the EEZ of a coastal state, which was not provided for in UNCLOS, see Jensen, *supra* note 438, p. 10.

[440] ATCM XXII Final Report, Tromsø, Norway, 25 May – 5 June 1998, para. 86.

passed a resolution recommending that the Consultative Parties provide input to the Draft Code to IMO with regard to shipping operations within the Antarctic Treaty Area.[441]

In 1999, the Marine Safety Committee (MSC) reviewed the draft Polar Code and in view of the dissatisfaction of some Member Countries agreed to further develop the draft Polar Code as recommendatory guidelines applicable only to Arctic ice-covered waters.[442] Three years later, the Marine Environment Protection Committee (MEPC) and the MSC approved the non-mandatory "Guidelines for ships operating in Arctic ice-covered waters".[443]

These Guidelines aim to address those additional provisions considered necessary for consideration beyond existing SOLAS requirements, in order to take into account the climatic conditions of Arctic ice-covered waters and to meet appropriate standards of maritime safety and pollution prevention.[444] They are further intended to promote the navigation safety and to prevent pollution from ship operations through an integrated approach, addressing the fact that the Arctic environment imposes additional demands on ship systems, including navigation, communications, life-saving, main and auxiliary machinery, etc. and also demands particular attention to human factors including training and operational procedures.[445]

The Guidelines have also been criticised for various reasons, among them a lack of detailed uniform international standards on training, a failure to require actual ice navigational experience for ice navigators and limited provisions on prevention and mitigation of sea-spray icing on ships.[446]

At an MSC session in 2004, South Africa on behalf of the ATCP proposed to amend the Arctic Guidelines so that they would also apply to ships operating in ice-covered waters in the Antarctic Treaty Area.[447] The MSC referred the matter to the DE Sub-Committee,[448] which agreed that

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[441] Resolution 3 (1998), ATCM XXII, CEP I, Tromsø, adopted 05 June 1998.

[442] Outcome of discussion at the 71st session of the Maritime Safety Committee, doc. ATCM XIII/IP 111.

[443] IMO, Guidelines for Ships Operating in Arctic Ice-Covered Waters, 23 December 2002, IMO doc. MSC/Circ.1056/MEPC/Circ.399, available at: http://www.imo.org/includes/blastDataOnly.asp/data_id%3D6629/1056-MEPC-Circ399.pdf, last visited 13 May 2010.

[444] *Ibid*., P-1.2.

[445] *Ibid*., P-2.1 – P-2.5; IMO MSC/Circ.1056/MEPC/Circ.399, 23 December 2002, the Guidelines are structured in four parts: Part A contains construction provisions, part B addresses equipment, part C concerns ship operations, crewing, and emergencies and part D covers provisions for environmental protection and damage control.

[446] Arctic Marine Shipping Assessment 2009 Report, *supra* note 65, p. 57.

[447] Outcome of the XXVIIth Antarctic Treaty Consultative Meeting, Note by the Secretariat, MSC 79/8/2, 18 August 2004.

[448] IMO, Maritime Safety Committee, 79th session, Agenda item 23, Report of the Maritime Safety Committee on its seventy-ninth session, IMO DOC. MSC 79/23, 15 December 2004.

> in addition to the inclusion of provisions relating to operation of ships in the Antarctic region, the Guidelines also needed to be generally updated in order to take into account technical developments since their approval in 2002, especially with regard to damage stability, double bottoms and the carriage of pollutants in spaces adjacent to the outer hull.[449]

At the next session, the DE Sub-Committee agreed to completely revise the Guidelines instead of amending the existing ones.[450] To that end, a correspondence group, under Canadian co-ordination was established.[451] On behalf of the Correspondence Group, Canada submitted a proposal for amendment of the Guidelines in late 2008.[452] The "Guidelines for Ships Operating in Polar Waters"[453] were agreed by the DE[454] and consequently adopted by the IMO Assembly in late 2009.

They are intended to apply to ships constructed on or after 1 January 2011 and to those constructed before that date "as far as is reasonable and practicable".[455] Like its predecessor, the guidelines are recommendatory in nature (no. P-1.4).

In addition to broadening its scope of application to include Antarctic waters, the area of application is not restricted to ice-covered waters anymore. The respective reference in the definitions was deleted. Moreover, the new Guidelines update the 2002 Guidelines with regard to the "technical, technological and regulatory developments since their approval".[456]

The new Guidelines also take into account that the crew needs to be trained to cope with the challenges posed by the polar environment. Therefore, every ship operating in polar waters should carry at least one ice navigator (no. 1.2.1), who should have satisfactorily completed an approved training programme in ice navigation according to the model course for Ice Navigation currently being developed by the IMO (no. 14.2).

Importantly, the new guidelines contain a provision recommending that only ships with a Polar Class designation or a comparable alternative standard of ice-strengthening appropriate to the anticipated ice conditions should operate in polar ice-covered waters, (no. G-2.1).[457]

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[449] IMO, Sub-Committee on Ship Design and Equipment, 50th Session, Agenda item 27, Report to the Maritime Safety Committee, IMO DOC. DE 50/27, 16 April 2007, para. 15.2.

[450] *Ibid*., para 11.6.

[451] *Ibid*., para 11.7.

[452] IMO, Sub-Committee on Ship Design and Equipment, 52nd Session, Agenda item 9, Report of the Correspondence Group on Guidelines for ships operating in Arctic ice-covered waters, IMO DOC. DE 52/9/1, 12 December 2008.

[453] "Guidelines for Ships Operating in Polar Waters", Resolution A.1024(26), adopted on 2 December 2009 (Agenda item 10), available at: http://www.sofartsstyrelsen.dk/SiteCollectionDocuments/CMR/Sejladssikkerhed,%20GMDSS%20og%20SAR/A.1024(26)%20Guidelines%20for%20ships%20operating%20in%20polar%20waters.pdf, last visited 5 October 2010.

[454] IMO, Sub-Committee on Ship Design and Equipment, 52nd Session, Agenda item 21, Report to the Maritime Safety Committee, IMO DOC. DE 52/21/Add.1, 16 April 2009.

[455] See recital no. 10 and 11 Guidelines for Ships Operating in Polar Waters, *supra* note 732.

[456] See recital no. 6 Guidelines for Ships Operating in Polar Waters, *ibid*.

[457] See International Association of classification societies (IACS), Requirements concerning Polar Class, IACS Req. 2006/Rev.1, 2007/Corr.1, 2007, available at: http://www.iacs.org.uk/

The provisions dealing with environmental protection and damage control have been adapted as well: Environmental protection procedures to be included in the ship's operating manual should be "tailor-made to cover the remoteness and other environmental factors particular to Antarctic and Arctic waters" (no. 16.1.2). Additionally, a new provision inserted into the new guidelines recommends that "[p]rocedures for the protection of the environment under normal operations should take into account any applicable national and international rules and regulations and industry best practices related to operational discharges and emissions from ships, use of heavy grade oils, strategies for ballast water management, use of anti-fouling systems, and related measures" (no. 16.3).

bb) Towards a Mandatory "Polar Code"

In 2009, Denmark, Norway and the United States submitted a proposal to MSC to add a high-priority item to the work programme of the DE, "Development of a mandatory Code for ships operating in polar waters", with a target completion date of 2012.[458] One year later, the DE agreed to establish a correspondence group under the coordination of Norway to develop a draft Code.[459]

The Polar Code was intended to cover the complete ambit of shipping-related issues concerning navigation under the particular polar circumstances, i.e. ship design, construction and equipment; operational and training matters; and also protection of the polar environment.[460]

Discussions within DE revealed that the Code should be predicated upon a risk-based/goal-based approach with functional requirements supported by prescriptive provisions.[461] Goal-based standards (GBS) should deliver the standards against which the safety of ships would be examined.[462] The advantage of this methodology is seen in the flexibility for different designs and arrangements.[463]

document/public/publications/unified_requirements/pdf/ur_i_pdf410.pdf, last visited 18 October 2010.

[458] IMO, Maritime Safety Committee, 86th session, Agenda item 23, 24 February 2009, Mandatory application of the polar guidelines, Submitted by Denmark, Norway and the United States.

[459] IMO, Sub-Committee on Ship Design and Equipment, 53rd session, Agenda item 26, 15 March 2010, Report to the Maritime Safety Committee, IMO Doc. 53/26, p. 38.

[460] See IMO, Maritime Safety Committee, *supra* note 458.

[461] IMO, Sub-Committee on Ship Design and Equipment, 53rd session, *supra* note 459; IMO, Sub-Committee on Ship Design and Equipment, 54th session, Agenda item 23, 17 November 2010, Report to the Maritime Safety Committee, IMO Doc. DE 54/23, p. 25.

[462] See IMO, Sub-Committee on Ship Design and Equipment, 54th session, Agenda item 13, 27 July 2010, Risk-based concept, Submitted by Germany, IMO Doc. 54/13/1, p. 1.

[463] IMO, Sub-Committee on Ship Design and Equipment, 54th session, Agenda item 23, 17 November 2010, Report to the Maritime Safety Committee, IMO Doc. DE 54/23, p. 25.

A core issue in the development of the Polar Code is thus the identification of hazards present for ships navigating in the harsh polar environments. The correspondence group drafted a "hazard matrix", including *inter alia* risks resulting from the low air and water temperature, extreme and rapidly changing weather, presence and variability of sea ice, reduced navigational aids and limited search and rescue capabilities.[464]

Based on the decision made during the 53rd session of the DE, the correspondence group developed a draft structure of the Polar Code.[465] Although work on the draft is on-going and further development and amendments are likely, the basic structure as well as several key elements seem to have been agreed upon.

The Code should contain both mandatory and recommendatory parts, with the mandatory part to supplement the requirements of SOLAS, MARPOL "and other relevant conventions for ships to which those Conventions apply, taking account of the additional hazards in polar operating environments".[466] The recommendatory part should give additional guidance in the application of the mandatory part.[467] There should also be common requirements for both Polar Regions as well as separate ones specific to the Arctic and the Antarctic.[468] Initially, the Code should apply to SOLAS passenger and cargo ships, and later requirements for non-SOLAS ships, e.g. fishing vessels should be added.[469]

The Code should also contain a chapter on environmental protection. Norway developed a draft proposal for this chapter putting forward six areas of concern: oil and chemical spills; discharges from normal operations[470]; anti-fouling systems; ballast water discharge; ship strikes with sea mammals; and underwater strike.[471]

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[464] IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 12, 17 December 2010, Report of the Correspondence Group, Submitted by Norway, IMO Doc. DE 55/12/1, Annex.

[465] See IMO, Sub-Committee on Ship Design and Equipment, 54th session, Agenda item 13, 2 August 2010, Development of a Mandatory Code for Ships Operating in Polar Waters, Report of the correspondence group, Submitted by Norway, IMO Doc. DE 54/13/3, Annex.

[466] See IMO, Sub-Committee on Ship Design and Equipment, 54th session, Agenda item 13, 2 August 2010, Development of a Mandatory Code for Ships Operating in Polar Waters, Report of the correspondence group, Submitted by Norway, IMO Doc. DE 54/13/3, Annex, p. 3.

[467] *Ibid.*

[468] IMO, Sub-Committee on Ship Design and Equipment, 53rd session, Agenda item 26, 15 March 2010, Report to the Maritime Safety Committee, IMO Doc. 53/26, p. 38; 54th session, Agenda item 13, 2 August 2010, Development of a Mandatory Code for Ships Operating in Polar Waters, Report of the correspondence group, Submitted by Norway, IMO Doc. DE 54/13/3, Annex, p. 3.

[469] IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 22, 15 April 2011, Report to the Maritime Safety Committee, IMO Doc. DE 55/22, p. 23.

[470] Including discharge of oil and oily mixtures; garbage disposal; sewage; and air pollution. IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 22, 17 December 2010, Draft proposal for an environmental protection chapter for inclusion in the Polar Code, IMO Doc. DE 55/12/5, p. 2.

[471] IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 22, 17 December 2010, Draft proposal for an environmental protection chapter for inclusion in the Polar Code, IMO Doc. DE 55/12/5, p. 2.

DE decided to use the definition for polar waters including Arctic and Antarctic waters as laid down in the Guidelines for ships operating in polar waters.[472] Despite drawing criticism from environmental NGOs,[473] Arctic waters are defined to exclude waters west and north of Iceland as well as the waters north of Norway. Additionally, concerning the Bering Sea, the limit of Arctic waters as defined in the Guidelines is set at 60°N thus excluding parts of those ecosystems.

Also, DE decided to exclude the issues of black carbon emissions,[474] the loss of harmful substances in packaged form (HSPF) and containers,[475] and standards for discharges of sewage, grey water and sewage sludge[476] from further consideration.[477]

As a result, the Code may lack comprehensive provisions to protect the Arctic marine environment from the risks associated with increased maritime traffic. Although a binding Code means a step in the right direction, environmental concerns will probably not be effectively addressed by it.

b) Offshore Oil and Gas Extraction

Another economic activity that is rapidly expanding in the Arctic bringing severe environmental hazards is offshore oil and gas extraction. However, despite the risks, the regulation of this sector is patchy. None of the international conventions on protection of the marine environment is solely concerned with the regulation of offshore oil and gas development.[478]

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[472] See G-3.2, G-3.3 and G-3.4 of the Guidelines, *supra* note 453.

[473] See IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 12, 14 January 2011, Polar Code boundaries for the Arctic and Antarctic, Submitted by FOEI, IFAW, WWF and Pacific Environment, IMO Doc. DE 55/12/8; Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 12, 28 January 2011, Polar Code boundaries for the Atlantic side of the Arctic, Submitted by FOEI, IFAW, WWF and Pacific Environment, IMO Doc. DE 55/12/17.

[474] See IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 12, 28 January 2011, Reducing black carbon emissions from vessels in the Polar Regions, Submitted by FOEI, CSC, IFAW, WWF and Pacific Environment, IMO Doc. DE 55/12/18.

[475] See IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 12, 28 January 2011, Harmful substances in packaged form and containers in Arctic waters, Submitted by FOEI, IFAW, WWF and Pacific International, IMO Doc. DE 55/12/16.

[476] See IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 12, 28 January 2011, Sewage and sewage-related discharges in polar regions, Submitted by FOEI, IFAW, WWF and Pacific Environment, IMO Doc. 55/12/20.

[477] IMO, Sub-Committee on Ship Design and Equipment, 55th session, Agenda item 22, 15 April 2011, Report to the Maritime Safety Committee, IMO Doc. DE 55/22, p. 26.

[478] Sandra Kloff/Clive Wicks, Environmental management of offshore oil development and maritime oil transport, A background document for stakeholders of the West African Marine Eco Region, IUCN Commission on Environmental, Economic and Social Policy, October 2004, p. 48.

However, four instruments that apply to the Arctic marine environment contain provisions dealing with these activities[479]: UNCLOS, OSPAR, MARPOL 73/78 and the International Convention on Oil Pollution Preparedness, Response, and Co-operation[480] (OPRC).[481]

UNCLOS lays down the basic rules on sovereign rights in offshore hydrocarbon resources. As stated above, the coastal state has the exclusive right to explore and exploit the natural resources[482] of the seabed and subsoil within its (legal) continental shelf, including a possible extended continental shelf.[483] This right is subject to the duty to protect and preserve the marine environment[484] and duties regarding marine environmental pollution, which are contained in part XII UNCLOS.[485] With respect to seabed activities that are subject to national jurisdiction, such as offshore oil and gas activities, Article 208(1) and (3) UNCLOS prescribe that States must adopt and enforce national laws and regulations to prevent, reduce and control pollution arising out of such activities that are to be no less effective than international rules, standards and recommended practices and procedures.

Within the Convention Area, the OSPAR Convention applies to offshore oil and gas exploration and exploitation. Of particular relevance is Annex III on the prevention and elimination of pollution from offshore sources. It prohibits "[a]ny dumping of wastes or other matter from offshore installations".[486] The Contracting Parties have to ensure that the use, or the discharge or emission from, offshore sources of substances, which may reach and affect the maritime area are strictly subject to authorisation or regulation by the competent national authorities[487] and provide for a system of monitoring and inspection to assess compliance with the relevant regulations.[488] Furthermore, the Contracting Parties have to use the BAT and the BEP when adopting programmes and measures for the purpose of preventing pollution from offshore sources.[489] The Annex also contains detailed

[479] Koivurova and Molenaar, *supra* note 214, p. 25.

[480] International Convention on Oil Pollution Preparedness, Response and Co-operation, adopted 30 November 1990, entered into force 13 May 1995.

[481] In addition, there are the 1983 Canada-Denmark Agreement for Cooperation Relating to the Marine Environment (1983 Agreement) and the 1993 Agreement Between Denmark, Finland, Iceland, Norway, and Sweden Concerning Cooperation Measures to Deal with Pollution of the Sea by Oil or Other Harmful Substances (1993 Agreement).

[482] The natural resources referred to include mineral and offshore hydrocarbon and other non-living resources, see Article 77(4) UNCLOS.

[483] Article 77 UNCLOS.

[484] Article 193 UNCLOS.

[485] See Timo Koivurova and Kamrul Hossain, "Background Paper, Offshore Hydrocarbon:: Current Policy Context in the Marine Arctic," (Arctic Transform, 4 September 2008), p. 20.

[486] Article 3(1) Annex III.

[487] Article 4(1) Annex III.

[488] Article 4(2) Annex III.

[489] Article 2 Annex III.

provisions on the dumping of disused offshore installations and pipelines.[490] However, the Contracting Parties decided at a Ministerial Meeting that the "dumping, and the leaving wholly or partly in place, of disused offshore installations within the maritime area is prohibited".[491]

MARPOL 73/78 is the principal international instrument covering prevention of pollution of the marine environment by ships from operational or accidental causes. It is relevant for oil and gas exploration and exploitation due to the definition of ship under this Convention as "a vessel of any type whatsoever operating in the marine environment [. . .] [including] [. . .] fixed or floating platforms."[492] Fixed and floating drilling rigs and other platforms have to comply with the requirements concerning ships of 400 tons gross tonnage when engaged in the exploration, exploitation and associated offshore processing of sea-bed mineral resources.[493] The MARPOL Convention deals with "jurisdiction, powers of enforcement, and inspection", while its annexes contain "anti-pollution regulations" setting technical limits for oil discharges.[494]

Parties can designate "special areas"[495] under Annex I (oil), Annex II (noxious liquid substances in bulk), Annex V (garbage) or as an Emission Control Area under Annex VI (air pollution) if these areas are considered vulnerable to pollution.[496] A special area is defined as "a sea area where for recognised technical reasons in relation to its oceanographic and ecological conditions and to the particular character of its traffic, the adoption of special mandatory methods for the prevention of sea pollution"[497] by oil, noxious liquid substances, or garbage, as applicable, is required. Under the Convention, these Special Areas are provided with a higher level of protection than other areas of the sea. Within the specified area discharges can be completely prohibited with minor and well-defined exceptions. Rigs operating in a special area are prohibited from discharging oil in that area "except when the oil content of the discharge without dilution does not exceed 15 parts per million." In contrast to the Antarctic that is listed as a "special area" under MARPOL, no part of the marine Arctic has thus far been proposed for this designation.

The OPRC obligates its parties to establish all appropriate measures to prepare for and respond to oil pollution incidents, either nationally or in co-operation with

[490] Article 5 Annex III.

[491] Provision 2 of the OSPAR Decision 98/3 on the Disposal of Disused Offshore Installations, available at http://www.ospar.org/documents/dbase/decrecs/decisions/od98-03e.doc, last visited 22 March 2011.

[492] Article 2(4) MARPOL 73/78.

[493] Regulation 21, Annex I.

[494] See Kristin N. Casper, "Oil and Gas Development in the Arctic: Softening of Ice Demands Hardening of International Law," *Natural Resources Journal* 49 (2009), 825–882, at 852.

[495] For a list of Special areas under MARPOL see http://www.imo.org/OurWork/Environment/PollutionPrevention/SpecialAreasUnderMARPOL/Pages/Default.aspx, last visited 22 March 2011.

[496] The Antarctic sea, in contrast, has been classified as special area both under Annex I and under Annex II, MARPOL 73/78, Annex I, regulation 11, number 7; Annex II, regulation 13(8).

[497] MARPOL 73/78, Annex I, regulation 11, Annex V, regulation 1(3).

other countries.[498] In addition, the parties have to ensure that operators of offshore units under their jurisdiction have oil pollution emergency plans.[499] Pollution incidents have to be reported to coastal authorities[500] and assistance has to be provided to other parties in case of an oil pollution incident.[501] Since Russia's accession to the Convention in 2009, all Arctic States are parties to the OPRC.[502]

Relevant soft law consists of the 'Arctic Offshore Oil and Gas Guidelines'[503] that have been developed and recently updated by PAME. The Guidelines "are intended to be of use to the Arctic nations for offshore oil and gas activities during planning, exploration, development, production and decommissioning".[504] They shall prompt the Arctic States to establish policies, which ensure "that offshore oil and gas activities are conducted so as to provide for human health and safety and protection of the environment."[505] The Guidelines include various "Goals for Environmental Protection during Oil and Gas Activities in the Arctic Area", *inter alia* to avoid adverse effects on air and water quality and in the distribution, abundance or productivity of species or populations of species. They also contain some general principles, among them the precautionary approach, including the polluter pays principle[506] and the principle of sustainable development, encompassing the protection of biological diversity.[507] The Guidelines furthermore dedicate a section to EIA[508] and Environmental Monitoring,[509] respectively. EIA procedures should be used to establish the potential effects of offshore oil and gas exploration, development, transportation and infrastructure on the environment and human communities[510] to integrate environmental considerations in the overall planning from the beginning.[511]

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[498] Article 1(1) OPRC.

[499] Article 3(2) OPRC.

[500] Article 4(1)(a) OPRC.

[501] Article 7 OPRC.

[502] See IMO website at http://www.imo.org/About/Conventions/StatusOfConventions/Pages/Default.aspx.

[503] Arctic Offshore Oil and Gas Guidelines, *supra* note 69.

[504] *Ibid.*, p. 4.

[505] *Ibid.*

[506] *Ibid.*, p. 6.

[507] *Ibid.*, pp. 6 *et seq.*

[508] *Ibid.*, pp. 16 *et seqq.*

[509] *Ibid.*, pp. 21 *et seqq.*

[510] *Ibid.*, p. 13. EIAs and preliminary impact assessments (PEIA) should consider, in particular, the consequences on human society including indigenous ways of life; cultural heritage; socio-economic systems; other human activities (e.g., tourism, scientific research, fishing, and shipping); overall landscape (e.g., fragmentation); subsistence ways of life (e.g. harvest practices and availability of food supply); oil spill preparedness and response in sea ice conditions; permafrost and transition zones; climate; sustainability of renewable resources; flora and fauna including marine mammals; air, water and sediment quality; ports and shore reception facilities; Arctic shipping routes; ice dynamics; human health; and the interaction among all of these, *ibid.* pp. 13 *et seq.*

[511] *Ibid.*, p. 14.

As mentioned previously, the Arctic States decided to develop an international legal instrument on Arctic marine oil pollution, preparedness and response.[512] Yet, so far it is unclear what this instrument will contain and when it will be completed.

V Deficits of the International Regime for the Arctic Marine Environment

1 Cross-Sectoral Deficits

a) No Integrated, Ecosystem-Based, Cross-Sectoral Management

As has been seen in the second chapter of this assessment, the consequences of climate change will increase fishing, shipping, oil and gas exploitation, tourism, and other human activities in the region that will augment pressure on Arctic ecosystems and habitats that are already endangered. The second part showed that management of these environment-sensitive activities is based on a sectoral approach, i.e. each of these activities is in general regulated under a separate regime. This approach suffers from the weakness of principally ignoring cumulative impacts of several undertakings or interactions between multiple stressors. The treaties that deal with single species instead of certain sectors, likewise neglect the interactions within and among natural systems.[513] No comprehensive legal regime exists to integrate the various agreements created to cope with existing problems concerning the marine environment.[514]

aa) Legal and Institutional Fragmentation

Echoing the structure of international bodies dealing with the Arctic marine environment, the relevant treaties, agreements and conventions are manifold and lack appropriate coordination. This phenomenon is not particular to the marine Arctic, but a common issue related to the fragmentation of international law.[515]

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[512] Arctic Council, Nuuk Declaration, *supra* note 27, p. 4.

[513] Although some reference to the ecosystem approach is made in the polar bear agreement, *supra* note 402.

[514] See Donald R. Rothwell, "International law and the protection of the arctic environment," *International & Comparative Law Quarterly* (1995) 280–312, at 298.

[515] In the recent past, the issue of fragmentation and its effects has become the subject of intense debate among legal scholars, see Harro van Asselt, Francesco Sindico and Michael A. Mehling, "Global Climate Change and the Fragmentation of International Law," *Law & Policy* 30, no. 4 (2008), 423–449, at 426; Gerhard Loibl, "International Environmental Regulations - Is a Comprehensive Body of Law Emerging or is Fragmentation Going to Stay?," in *International*

This fragmentation has increased since the end of the Cold War,[516] with numerous specialised legal subsystems evolving to focus on certain issues and/or certain areas. These are often administered by individual international organisations. Therefore, international law is currently an "unorganized system" consisting of universal, regional and bilateral systems and sub-systems with different levels of integration.[517]

The advantage of this system is that it produces specialised and diverse regulation. However, "such specialized law-making and institution-building tends to take place with relative ignorance of legislative and institutional activities in the adjoining fields and of the general principles and practices of international law. The result is conflicts between rules or rule-systems, deviating institutional practices and, possibly, the loss of an overall perspective on the law."[518]

These risks resulting from fragmentation also apply to international environmental law. Particularly since the first United Nations Conference on environmental issues in Stockholm in 1972,[519] the number of international environmental agreements on the global, regional and sub-regional level has increased rapidly.[520] By and large, these regulations were created as response to an identified environmental issue and thus adopted a narrow focus. Most of the international environmental agreements also set up their own institutions, such as a Conference of the Parties, Secretariat and subsidiary bodies. In contrast to other areas of law, there is no central institution to administer the various international environmental

law between universalism and fragmentation: *Festschrift in honour of Gerhard Hafner*, ed. Isabelle Buffard et al., 783–95 (Leiden; Boston: Martinus Nijhoff Publishers, 2008) at 783; it was included in the long-term programme of the International Law Commission in 2000, which established a special Study Group on the topic in 2002. Four years later, this Study Group presented its final report, in which it concluded that conflicts arising from fragmentation could be dealt with through existing techniques used to resolve normative conflicts, but recommended that "increasing attention will have to be given to the collision of norms and the rules, methods and techniques for dealing with such collisions.", Report of the ICL Study Group, Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law, Doc. A/CN.4/L.702, 18 July 2006.

[516] Gerhard Hafner, "Pros and Cons Ensuing from Fragmentation of International Law," *Michigan Journal of International Law* 25 (2003–2004), 849–863, at 849.

[517] *Id.*, Report of the ICL Study Group, Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law, Doc. A/CN.4/L.702, 18 July 2006, Annex, p. 144.

[518] *Martti Koskenniemi*, Fragmentation of international law: difficulties arising from the diversification and expansion of international law, Report of the Study Group of the International Law Commission, A/CN.4/L.682, 13 April 2006, p. 12.

[519] United Nations Conference on the Human Environment, Stockholm 5 to 16 June 1972, see Declaration of the United Nations Conference on the Human Environment, 21st plenary meeting, 16 June 1972, Chapter 11, available at: http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1503&l=en, last visited 24 August 2011.

[520] Cathrin Zengerling, "Sustainable development and international (enrivonmental) law," *Zeitschrift für Europäisches Umwelt- und Planungsrecht* 8 (2010) 175–186, at 175; Loibl, *supra* note 515, at 783.

agreements.[521] Thus, the fragmentation of regulations goes hand in hand with institutional fragmentation.

As a consequence, frictions among different environmental legal regimes occur. Parallel regulations applicable to the same matter trigger the question, which one should be applied to a given case.[522] In the worst case, competitive regulations can impose mutually exclusive obligations on states.[523] Furthermore, the differing enforcement mechanisms under the various regimes enable states to choose the mechanisms most favourable for them.[524]

bb) Application of the Ecosystem Approach

Concerning the effectiveness of international environmental law, fragmentation most notably represents a significant impediment for the application of the ecosystem approach and thus to sustainable management.[525]

Ecosystems are dynamic complexes of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.[526] The 'ecosystem approach' is aimed at managing the interactions between frequently conflicting environmental, economic and social values and interests to maintain the integrity of the structure and proper operation of these functional units. It is also considered as offering a planning and management framework for balancing the objectives of conservation and sustainable use.[527] The ecosystem approach has long been recognised as a key tool for protection of the marine environment and encouragement of its application by 2010 had been agreed upon by States at the World Summit on Sustainable Development (WSSD) in 2002.[528]

To ensure that interconnections and interdependencies are taken into account it is imperative to ensure coordination and harmonisation between the spatially and sectorally different regimes. In the end, all regulations need to be integrated, not only the international environmental regulations, but also regulations from other

[521] *Ibid*., at 788.

[522] See Southern Bluefin Tuna Case (Australia & New Zealand vs. Japan), Award on Jurisdiction and Admissibility, ICSID (W. Bank) (Arbitral Tribunal constituted under Annex VII of UNCLOS).

[523] Hafner, "Pros and Cons Ensuing from Fragmentation of International Law", *supra* note 516, at 851.

[524] So-called "forum shopping", see *ibid*., p. 857.

[525] See Tullio Treves, "The Development of the Law of the Sea since the Adoption of the UN Convention on the Law of the Sea: Achievements and Challenges for the Future," in *Law, technology and science for oceans in globalisation*, *supra* note 222, 41–58.

[526] Article 2 CBD.

[527] UN General Assembly, Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting, 17 July 2006, Un Doc. A/61/156, para. 28.

[528] Plan of Implementation of the World Summit on Sustainable Development, UN Doc. A/CONF. 199/20, 4 September 2002, Resolution II, Annex, para. 30. (d).

areas of law such as trade or social law. But ahead of this momentous step, even the integration of international environmental agreements would be a valuable step forward.[529]

cc) Marine Spatial Planning (MSP)

As with the sector-by-sector and species-by-species management of the marine environment, the division of the ocean into different jurisdictional zones also impedes an ecosystem-based approach. Obviously, ecological entities do not respect artificial boundaries like the 200-nm-zone. Rather, "[t]he marine environment—including the oceans and all seas and adjacent coastal areas—forms an integrated whole".[530] Nonetheless, the different zones are regulated by different regimes—among them the eight Arctic states' different national jurisdictional frameworks.

While the Atlantic sector of the marine Arctic is managed by the OSPAR Commission according to the OSPAR Convention that recognises the ecosystem approach, the remainder of the marine Arctic is not covered by coordinating bodies or a single overarching body to ensure integrated, cross-sectoral ecosystem-based ocean management.[531]

During the last decade, marine spatial planning (MSP) has increasingly become recognised as a tool for establishing ecosystem-based management in the marine environment.[532] While spatial planning is widely accepted as an important instrument for the management of land use in many parts of the world, a plan-based approach to the management of the use of marine areas is still the exception.[533]

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[529] On moving towards the goal of an integrated approach the establishment of an international environmental organisation (see Hans-Joachim Koch and Christin Mielke, "Globalisierung des Umweltrechts," *Zeitschrift für Umweltrecht* 9 (2009) 403–409, at 408; Amedeo Postiglione, *Global environmental governance* (Bruxelles: Bruylant, 2010); Julie Ayling, "Serving many voices: progressing calls for an international environmental organisation," *Journal of Environmental Law* 9, no. 2 (1997), 243–270; Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU), *Welt im Wandel*: *neue Strukturen globaler Umweltpolitik* (Berlin: Springer, 2001).) should be envisaged, ideally paired with an international environmental tribunal (see Ellen Hey, *Reflections on an international environmental court* (The Hague; Cambridge: Kluwer Law International, 2000); Sean D. Murphy, "Does the world need a new International Environmental Court?," *The George Washington Journal of International Law and Economics*, no. 32 (2000), 333–349; Alfred Rest, "The indispensability of an international environmental court," *Review of European Community & International Environmental Law* 7, no. 1 (1998), 63–67.

[530] United Nations Conference on Environment and Development, Agenda 21, Rio de Janeiro, 3 to 14 June 1992, chapter 17, available at: http://www.un.org/esa/dsd/agenda21/index.shtml, last visited 19 February 2011.

[531] Timo Koivurova and Erik J. Molenaar, *supra* note 214, p. 9.

[532] Fanny Douvere, "The importance of marine spatial planning in advancing ecosystem-based sea use management," *Marine Policy* 32 (2008), 762–771, at 762, 766.

[533] *Ibid*., at 762.

However, ecosystem-based management itself is area-based, concentrating on a certain ecosystem and the array of activities impacting it.[534]

MSP can be defined as

> a process of analysing and allocating parts of the three-dimensional marine spaces to specific uses, to achieve ecological, economic and social objectives that are usually specified through the political process; the MSP process usually results in a comprehensive plan or vision for a marine region.[535]

Especially in areas with heavy "competition and conflicts relating to access and use of space and resources"[536] such as the North Sea region,[537] MSP is a crucial device for avoiding conflicts among different users as well as between human uses and the marine environment.[538]

The boundaries for MSP can be determined by "large marine ecosystems" (LMEs), a concept developed in the 1980s to delimitate ecosystems for management purposes.[539] LMEs are

> regions of ocean space encompassing coastal areas from river basins and estuaries on out to the seaward boundary of coastal current systems. They are relatively large regions on the order of 200,000 km^2 or larger, characterized by distinct bathymetry, hydrography, productivity, and trophically dependent populations.[540]

Worldwide, 64 LMEs have been defined,[541] 17 of them in the Arctic.[542] However, marine spatial planning in the Arctic faces particular challenges: Firstly, detailed and reliable scientific information about Arctic ecosystems that could be used as a basis for planning is still incomplete for many areas. Secondly, the impacts of climate change and the induced alterations in ecosystems complicate

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[534] Larry Crowder and Elliott Norse, "Essential ecological insights for marine ecosystem-based management and marine spatial planning," *Marine Policy* 32, no. 5 (2008), 772–778, at 772.

[535] Charles Ehler and Fanny Douvere, "Visions for a Sea Change: Report of the First International Workshop on Marine Spatial Planning,", IOC Manual and Guides 48 (UNESCO, Intergovernmental Oceanographic Commission and Man and the Biosphere Programme, 2007), p. 13.

[536] Douvere, "The importance of marine spatial planning in advancing ecosystem-based sea use management, *supra* note 532, at 768.

[537] See e.g. the management of the Trilateral Wadden Sea Cooperation Area, an initiative between the Netherlands, Germany and Denmark where integrated measures and spatial management are stressed, see Common Wadden Sea Secretariat, Wadden Sea Plan 2010, Eleventh Trilateral Governmental Conference on the Protection of the Wadden Sea, Wilhelmshaven 2010.

[538] See Frank Maes, "The international legal framework for marine spatial planning," *Marine Policy* 32, no. 5 (2008) 797–810, at 797.

[539] *Ibid.*, at 798.

[540] Kenneth Sherman, "Sustainability, Biomass Yields, and Health of Coastal Ecosystems: An Ecological Perspective," *Marine Ecology Progress Series* 112, 277–301 (1994), at 279 and Lewis M. Alexander, "Large marine ecosystems: A new focus for marine resources management," *Marine Policy* 17, no. 3 (1993), 186–198, at 186.

[541] See http://www.unep.org/regionalseas/issues/ecosystems/LMEs/default.asp.

[542] See http://www.pame.is/images/stories/Ecosystem_Approach/17-Arctic-LMEs-2006-new-version.jpg.

management. Thirdly, expanding and contracting sea ice further make spatial planning more difficult.[543]

b) No Network of Marine Protected Areas (MPAs)

A crucial tool for ecosystem-based management of the marine environment is the establishment of a representative network of MPAs, consistent with international law and based on scientific information[544]—a goal, which the international community pledged to accomplish by 2012.[545]

aa) Concept of MPAs

Currently, various—though mostly similar—definitions of MPAs exist. The most commonly used is the one developed by the IUCN:

> Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.[546]

MPAs range from small coastal ecosystems to large areas, even whole oceans. They serve to protect rare or vulnerable ecosystems and habitat, individual species or marine biodiversity in a specified area. The restrictions set up in order to achieve this protection include prohibition of, or restriction on, navigation, dumping, fishing activities, seabed exploration, land-based pollution, and access for tourism.[547]

The legal basis for establishing MPAs is derived from the general obligation to protect and preserve the environment (Article 192 UNCLOS) and its specification in Article 194(5) UNCLOS determining that measures to prevent, reduce and control pollution of the marine environment "shall include those necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened or endangered species and other forms of marine life". Furthermore, states have to cooperate on a global and regional basis to protect (Article 197 UNCLOS) and preserve the marine environment and to protect and preserve the high seas' living resources (Articles 117–118 UNCLOS). As discussed above,

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[543] See H. J. Diamond, "The Need for Ecosystem-Based Management of the Arctic," in *Changes in the Arctic environment and the law of the sea*, *supra* note 3, 389–98, at 394 *et seq*.

[544] Adalberto Vallega considers the designation of protected areas as the most important field of ecosystem management, *id*., *Sustainable ocean governance* (London; New York: Routledge, 2001), p. 56.

[545] Plan of Implementation of the World Summit on Sustainable Development, Johannesburg, 4 September 2002, para. 32(c).

[546] Resolution 17.38 of the IUCN General Assembly, 1988, reaffirmed in Resolution 19.46 (1994).

[547] See Sarah Wolf, Marine Protected Areas, Max Planck Encyclopaedia of Public International Law, 2010, paras. 2, 4–5.

states bordering an enclosed or semi-enclosed sea should coordinate the conservation of the living resources of the sea and the implementation of their rights and duties concerning the protection of the marine environment (Article 123 UNCLOS).

The extent of jurisdiction to regulate and enforce measures concerning MPAs depends on the location of the protected area. In the territorial sea, the coastal state can adopt and enforce respective measures due to its sovereignty, but has to respect the right of innocent passage of other states (see Articles 17–33 UNCLOS). In the EEZ the coastal state has jurisdiction with regard to the protection and preservation of the marine environment, but third states enjoy the freedom of navigation, overflight, laying of submarine cables and pipelines and other lawful uses of the sea. On the high seas, the legality of establishing MPAs is disputed.[548]

In addition to UNCLOS, various multilateral treaties contain provisions concerning the establishment of MPAs. Global instruments include MARPOL and its concept of Special Areas where particularly strict discharge standards apply and PSSAs identified and established by the IMO in combination with associated protective measures. Other examples for global marine protected areas include sanctuary areas established under the ICRW as well as Antarctic Specially Protected Areas or Specially Managed Areas that can be established under Annex V Protocol on Environmental Protection to the Antarctic Treaty. Regional instruments providing for the establishment of MPAs encompass the aforementioned OSPAR Convention and the Convention for the Protection of the Mediterranean Sea Against Pollution.[549]

As aforementioned, the establishment of a representative network of MPAs is the goal for the world community. An MPA network can be defined as a "collection of individual MPAs or reserves operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels designed to meet objectives a single reserve cannot achieve".[550] The establishment of a network is essential for species conservation: In many regions, MPAs that are big enough to sustain themselves cannot be created due to economic, social and political limitations. Networks of MPAs offer the spatial links needed to maintain ecosystem processes and connectivity, as well as improve resilience by spreading risk in the case of local disasters, climate change and other hazards, and thus help to ensure the long-term sustainability of populations while at the same time reducing socioeconomic impacts.[551]

[548] See *infra* cc).

[549] Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention), concluded 16 February 1976, entered into force 2 December 1978, 1102 UNTS 27.

[550] Dan Laffoley, *Establishing marine protected area networks*: *Making it happen* (Washington, D.C: IUCN-WCPA; National Oceanic and Atmospheric Association; The Nature Conservancy, 2008), p. 12.

[551] *Ibid.*

bb) Network of MPAs in the Arctic

Developing a network of protected areas within the Arctic was already "encouraged and promoted" by the Rovaniemi Declaration agreed upon by the Arctic States in 1991.[552] In 1996, CAFF endorsed a Strategy and Action Plan to implement a circumpolar network of protected areas.[553] Two years later, the Circumpolar Protected Areas Network (CPAN) Group was established as "instrument for practical cooperation" regarding the CPAN program.[554]

Since CPAN's initiation, the Arctic States have made considerable progress in establishing terrestrial protected areas. In 2004, when the last update on protected areas in the Arctic was issued, nearly 20 % of the land mass within the Arctic Region was under protected area status, classified according to IUCN categories.[555]

However, little of the marine Arctic has been designated as protected area and there are no high seas MPAs at all so far.[556] The reason for that can partly be attributed to the fact that CPAN has been virtually inactive since 2004. At the tenth CAFF International Working Group meeting that year, "all three co-chairs of CPAN resigned" because of shortage of resources, lack of interest or too many duties as Chair of other bodies.[557] Until 2006, the Executive Secretary of CAFF served as Acting Chair. Then it was decided that CPAN would "not move forward

[552] Rovaniemi Declaration, Declaration on the protection of the Arctic Environment, Rovaniemi, 14 June 1991, p. 1.

[553] Conservation of Arctic Flora and Fauna (CAFF), Circumpolar Protected Areas Network (CPAN), Strategy and Action Plan, CAFF Habitat Conservation Report No. 6, Directorate for Nature Management, Trondheim, Norway, 1996, available at: http://arcticportal.org/uploads/3v/kl/3vklGMBX4PY7yUyECXLhAQ/HCR6-CPAN-Protected-Areas-Network-CPAN—Strategy-and-Action-Plan.pdf, last visited 7 March 2011.

[554] Conservation of Arctic Flora and Fauna, Circumpolar Protected Areas Network Expert Group (CPAN), Charter, 1998, available at: http://arcticportal.org/uploads/Ca/_Z/Ca_ZSqJ1wUQHq4cefwm-ZQ/Charter-CPAN.pdf, last visited 7 March 2011.

[555] Circumpolar Protected Areas Network (CPAN), CPAN Country Updates Report 2004, CAFF Habitat Conservation Report No. 11, available at: www.arcticportal.org, last visited 8 March 2011; the different IUCN categories for protected areas are: Category Ia: Strict nature reserve, Category Ib: Wilderness area, Category II: National park, Category III: Natural monument or feature, Category IV: Habitat/species management area, Category V: Protected landscape/seascape, and Category VI: Protected area with sustainable use of natural resources, see Dudley, Nigel (ed.), Guidelines for Applying Protected Area Management Categories, IUCN, Gland, Switzerland, 2008, available at: http://data.iucn.org/dbtw-wpd/edocs/PAPS-016.pdf, last visited 8 March 2011.

[556] Circumpolar Protected Areas Network (CPAN), CPAN Country Updates Report 2004, CAFF Habitat Conservation Report No. 11, available at: www.arcticportal.org, last visited 8 March 2011; Map of Protected areas in the Arctic, World Protected Areas Database, UNEP-WCMC (2005), WWF Russia, published 2007, available at: http://maps.grida.no/go/graphic/protected-areas-in-the-arctic, last visited 8 March 2011.

[557] Management Board Meeting, 1–3 February 2005, Helsinki, Finland, Minutes, no 8.3, available at: http://arcticportal.org/uploads/t-/9F/t-9FpbaWsOdX3RSz_UyIFw/CAFF-Board-Meeting-Helsinki-Finland-February-1-3-2005.pdf, last visited 8 March 2011.

until a country steps up to take the lead."[558] In CAFF's work plan for 2006–2008, it was noted that "though currently dormant due to a lack of country lead [. . .] CPAN work will resume when a country lead is in place".[559] However, no country was willing to accept this role. The work plan for 2009–2011 makes no mention of CPAN. Accordingly, it has to be assumed that the program will remain dormant for the foreseeable future and no instrument for cooperation between the Arctic States for identifying gaps in the network of circumpolar MPAs and enabling consistent conservation and management standard for protected areas is in place.

cc) MPAs in ABNJ

The establishment of MPAs in ABNJ raises various questions. The first relates to the compatibility of multi-purpose MPAs with international law, and in particular with the principle of freedom of the high seas.[560] The current international framework contains no single instrument that could serve as a basis for the designation of MPAs in ABNJ.[561] However, the duties associated with the protection and conservation of the marine environment laid down in UNCLOS apply to the high seas as well, thus supporting the establishment of MPAs in ABNJ.[562] Therefore, the principle of the high seas freedom has to be balanced with the duty of the global community to protect the marine environment.[563]

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[558] Record of Decisions, CAFF Management Board Meeting, Monday 13 February – Wednesday 15 February, 2006, Helsinki, Finland, available at: http://arcticportal.org/uploads/5M/C8/5MC8GnfbIMKz7pe4f-DwTg/CAFF-Board-Meeting-Helsinki-February-2006.pdf.

[559] CAFF 2006–2008 Work Plan – English and Russian Versions, CAFF International Secretariat, Akureyri, Iceland, p. 2, available at: http://archive.arcticportal.org/255/01/work-plan-all.pdf, last visited 8 March 2011.

[560] See e.g. "Managing Risks to Biodiversity and the Environment on the High Sea, Including Tools Such as Marine Protected Areas: - Scientific Requirements and Legal Aspects - Proceedings of the Expert Workshop held at the International Academy for Nature Conservation, Isle of Vilm, Germany, 27 February - 4 March 2001,", BfN-Skripten 43 (2001); Tullio Scovazzi, "Marine Protected Areas on the High Seas: Some Legal and Policy Considerations," *International Journal of Marine and Coastal Law* 19, no. 1 (2004) 1–17, at 5.

[561] Robin Warner, "Marine Protected Areas Beyond National Jurisdiction Existing Legal Principles and Future Legal Frameworks," in *Managing Risks to Biodiversity and the Environment on the High Sea, Including Tools Such as Marine Protected Areas: - Scientific Requirements and Legal Aspects - Proceedings of the Expert Workshop held at the International Academy for Nature Conservation, Isle of Vilm, Germany, 27 February - 4 March 2001*, ed. Hjalmar Thiel and Anthony Koslow, 149–168, BfN-Skripten 43, at 149; Erik J. Molenaar, "Managing biodiversity in areas beyond national jurisdiction," *International Journal of Marine and Coastal Law* 22, no. 1 (2007), 89–124, at 106; Scovazzi, *supra* note 560, at 16.

[562] Kristina Gjerde, "High seas marine protected areas," *International Journal of Marine and Coastal Law* 16 (2001), 515–528, at 526.

[563] Scovazzi, *supra* note 560, at 7.

While concerns about the state of biodiversity in ABNJ have been growing over recent years and various efforts have been commenced at the international level,[564] recognising the value of area-based management,[565] there are diverging views on some of the legal and policy issues relating to governance of high seas biodiversity.[566] One focus of the debate pertains to the "policy gap between the existing high seas regime and the establishment of an appropriate legal framework for the creation of successful high seas MPAs".[567] A proposal for an Implementation Agreement to UNCLOS with the main objective of conserving and managing marine biological diversity "including the establishment [. . .] of marine protected areas in areas beyond national jurisdiction" has been made by the European Union, but received only partial support. Until the way forward has been decided upon, many questions are still left open when establishing MPAs in ABNJ: Which entity should have a leading role in designing and operating such MPAs? Should the ultimate goal be the coordinated establishment of a global network of MPAs, or should regional mechanisms coordinate MPAs within their respective areas?[568] For the time being, the establishment of high seas MPAs in the Arctic remains a challenge.

c) Character of UNCLOS as Framework Convention

In the Ilulissat Declaration of 2008, the five Arctic coastal states considered UNCLOS as an "extensive international legal framework" and declared that they "therefore see no need to develop a new comprehensive international legal regime to govern the Arctic Ocean".[569] This assertion was supported in the Tromsø Declaration, adopted at the Sixth Ministerial Meeting of the Arctic Council in 2009, where the eight Arctic states affirmed "that an extensive legal framework applies to the Arctic Ocean including, notably, the law of the sea, and that this framework provides a solid foundation for responsible management of this ocean".[570]

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[564] See in particular UNGA, Report of the Secretary-General of the United Nations General Assembly on Oceans and the Law of the Sea, 19 October 2009, UN Doc. A/64/66/Add.2 and *id*., Report of the Secretary-General of the United Nations General Assembly on the Law of the Sea, 10 September 2007, UN Doc. A/62/66/Add.2.

[565] UNGA, Report of the Secretary-General of the United Nations General Assembly on Oceans and the Law of the Sea, 19 October 2009, UN Doc. A/64/66/Add.2, para. 134.

[566] Julian Roberts, Aldo Chircop and Siân Prior, "Area-based Management on the High Seas: Possible Application of the IMO's Particularly Sensitive Sea Area Concept," *International Journal of Marine and Coastal Law* 25 (2010) 483–522, at 492.

[567] *Ibid*., at 493.

[568] Yoshinobu Takei, Filling regulatory gaps in high seas fisheries: discrete high seas fish stocks, deep-sea fisheries and vulnerable marine ecosystems (Utrecht, 2008), p. 145 *et seqq*.

[569] Ilulissat Declaration, *supra* note 107.

[570] Tromsø Declaration on the occasion of the Sixth Ministerial Meeting of The Arctic Council, The 29th of Aprils 2009, Tromsø, Norway, available at: http://arctic-council.org/filearchive/Tromsoe%20Declaration.pdf, p. 8 et seq., last visited 20 April 2010.

The contention that no new comprehensive legal regime for the Arctic marine environment was necessary as UNCLOS already provided a legal framework—although supported by many legal scholars[571]—is misleading. As implied by the term "framework Convention", UNCLOS for most of its provisions, being of a general nature, depends on implementation through specific operative regulations.[572] Part XII UNCLOS on the protection and preservation of the marine environment is thus not intended to be a self-contained regime. In contrast, it is "expressly designed to operate as an 'umbrella' for further global, regional and national actions".[573] It provides a framework for a series of global and regional conventions on each of the topics covered by Part XII: ships, seabed operations, dumping, land-based pollution, and atmospheric pollution.[574] Therefore, UNCLOS does not contain comprehensive prohibitive or protective regulations for the marine environment, but embodies general principles for potential regulations and treaties on marine environmental protection.[575] Furthermore, the implementation mechanisms are weak and the interconnectedness of ecosystems is not addressed.[576]

In addition, UNCLOS only sets minimum standards regarding pollution by prescribing that "laws and regulations to prevent, reduce and control pollution of the marine environment [. . .] [and] other measures [. . .] shall be no less effective than international rules, standards and recommended practices and procedures", article 208(1)–(3) UNCLOS.[577] The established floor for pollution standards, however, is not sufficient to ensure adequate protection of the Arctic marine environment.

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[571] See Hans Corell, "Reflections on the possibilities and limitations of a binding legal regime," *Environmental Policy and Law* 37, no. 4 (2007), 321–324, at 321; Carl A. Fleischer, "The Continental Shelf beyond 200 Nautical Miles – a Crucial Element in the 'Package Deal': Historic Background and Implications for Today," in *Law, technology and science for oceans in globalisation*, *supra* note 222, 429–48, at 444; see Ted L. McDorman, "The Outer Continental Shelf in the Arctic Ocean," in *Law, technology and science for oceans in globalisation*, *ibid*., 499–520, at 500 *et seq*.; see also Young, *supra* note 74, at 180; the European Commission, http://euobserver.com/9/27104?print=1, last visited 15 February 2011.

[572] United Nations, Impact of the entry into force of the 1982 United Nations, Report of the Secretary-General, 20 October 1997, Doc. A/52/491, p. 18.

[573] United Nations, Law of the Sea: Protection and Preservation of the Marine Environment, Report of the Secretary-General (U.N. Doc. A/44/461), September 18, 1989.

[574] Patricia W. Birnie; Alan E. Boyle "International law and the environment", Oxford, New York: Oxford University Press 2002, p. 452.

[575] See Rainer Lagoni, "Die Abwehr von Gefahren für die marine Umwelt," in Umweltschutz im Völkerrecht und Kollisionsrecht: Referate und Thesen mit Diskussion; with English summaries of the reports; [22. Tagung in Trier vom 10. bis 13. April 1991] = (Environmental protection in public international law and private international law), ed. Rudolf Dolzer, 87–152 (Heidelberg: Müller, Jur. Verl., 1992), at 94.

[576] Jackson W. Davis, "The Need for a New Global Ocean Governance System," in *Freedom for the seas in the 21st century*: *ocean governance and environmental harmony*, ed. Jon M. van Dyke, Durwood Zaelke and Grant Hewison, 147–70 (Washington: Island Press, 1993), at 164.

[577] See also Articles 207(1), 209(2), 210(6), 211(2), 212(1).

As has been set out in the second chapter of this research, the Arctic is particularly vulnerable to pollution and other environmental threats due to a number of special circumstances: Low temperatures and little sunlight slow down the evaporation of toxic components as well as the physical, chemical and biological breakdown of pollutants. Arctic species and ecosystems are highly specialised and finely tuned to survive in this unique and extreme environment. In general, the terrestrial and marine ecosystems are relatively simple, so disruption of one link in the food chain can result in the collapse of the whole system. In addition, the Arctic shows considerable pre-pollution due to its function as a sink for contaminants produced and discharged elsewhere.[578] Due to all these features, environmental protection of the marine Arctic cannot be managed solely by means of the general provisions set out in global instruments designed to be applied universally and can thus not take the Arctic environment's special vulnerability into account.

As a global instrument, UNCLOS could not be tailored to the Arctic's ecological conditions. Of the 320 UNCLOS articles, only one specifically relates to ice-covered waters.[579] Leaving aside the important exception of Article 234 on ice-covered waters, UNCLOS makes no specific reference to environmental management of polar oceans and seas.[580] Therefore, standing alone, UNCLOS does not ensure adequate protection of the Arctic marine environment.

d) Gaps in Participation and Geographic Scope

Another problem of the legal regime for environmental protection in the marine Arctic is the fact, that the existing treaties, agreements and conventions lack general participation of all eight Arctic nations. The most prominent example is the aforementioned non-ratification of UNCLOS by the United States. Although the US generally accepts UNCLOS as customary law, they consider Part XI of UNCLOS on the Area as not reflecting customary international law and accordingly, as not creating rights and obligations for non-parties. Furthermore, as aforementioned the dispute settlement mechanism in Part XV of UNCLOS is procedural in nature, and not able to become part of customary law.[581] Therefore, a significant gap exists with regard to dispute settlement and the governance of the Area.[582]

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[578] Chapin and Hamilton, *supra* note 191, p. 2.

[579] Hertell, *supra* note 213, at 573.

[580] Rothwell, *supra* note 8, at 242; also, apart from UNCLOS, few legal instruments have been designed to deal specifically with the Arctic, see *id*., *supra* note 514, at 299.

[581] See Erik J. Molenaar, "Arctic Fisheries Conservation and Management: Initial Steps of Reform of the International Legal Framework," in *The Yearbook of Polar Law*, ed. Gudmundur Alfredsson and Timo Koivurova, 427–64 1 (Leiden Boston: Martinus Nijhoff Publishers, 2009), at 436.

[582] Koivurova and Molenaar, *supra* note 214, p. 6; see Thomas Blunden, "The legal status of the Arctic under contemporary international law: An Antarctic regime or poles apart?" *The journal of international maritime law* 15, no. 3 (2009), at 262.

There are other important agreements that suffer from incomplete participation. For instance, despite continuous encouragement, Russia has remained outside the OSPAR Convention.[583] The US have signed, but not ratified the Biodiversity Convention.[584] Additionally, along with Iceland and Russia they have signed, but not ratified the Espoo Convention on Environmental Impact Assessment in a Transboundary Context.[585] There are more items on the list of unsigned or unratified international instruments, with the consequence that many key obligations of marine environment conservation do not apply universally in the Arctic.

This is also true for the obligations arising from the area-based OSPAR Treaty as it does not apply to the entire Arctic Region due to its spatial scope limiting it to the Atlantic wedge of the marine Arctic.

In conclusion, comprehensive management and conservation of the Arctic marine environment suffers from gaps in participation and geographic scope[586] that result in a fragmentary application of regulations.

e) Deficits of the Legal Regime for Biodiversity Conservation in ABNJ

The ABNJ seems to hold the most gaps in the legal regime for conservation of the (Arctic) marine environment.[587] As discussed, on the high seas all States enjoy the freedoms of navigation, overflight, laying of submarine cables and pipelines, construction of artificial islands or installations, fishing and marine scientific research. And it is precisely this nature of the high seas as a "common property,

[583] Stokke, Hønneland and Schei, *supra* note 78, p. 98; see Lagoni, *supra* note 362, at 185.

[584] List of parties, Convention on Biological Diversity, http://www.cbd.int/convention/parties/list/, last visited 25 February 2011.

[585] Convention on Environmental Impact Assessment in a Transboundary Context, signed 25 February 1991, entered into force on 10 September 1997; List of parties, Convention on Environmental Impact Assessment in a Transboundary Context, http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&lang=en, last visited 25 February 2011.

[586] Chapin and Hamilton, *supra* note 191, p. 3; Commission of the European Communities, Communication from the Commission to the European Parliament and the Council, The European Union and the Arctic Region, COM(2008) 763 final, Brussels, 20.11.2008 p. 10.

[587] "If the Arctic Ocean beyond national jurisdiction is high seas, then its regulation is subject to the same tensions, uncertainties and shortcomings afflicting high seas governance the world over, including over-exploitation, inadequate exercise of flag State responsibilities, and lack of compliance with and enforcement of internationally agreed measures and conflict between different ocean uses. In the Arctic's case, the situation is exacerbated by the sheer scope of the pending extended continental shelf claims. The potential for disputes between coastal and other States over accommodation of conflicting high seas and continental shelf rights and uses is very real.", Rayfuse, *supra* note 261, at 209.

open access regime with equal right of user and exclusive flag state jurisdiction"[588] that constitutes the "central challenge for effective high seas governance".[589]

Worldwide awareness[590] of a number of significant factors with regard to the oceans, including; growing threats to marine ecosystems on the high seas through intensified use, such as increased maritime traffic and new human activities like bottom trawling and their consequences for seamounts; an enhanced scientific understanding of the high—and especially—the deep sea; and the awareness that it likely contains innumerable diverse life forms, has revealed the incomprehensiveness of the legal regime for the high seas.[591]

A major shortcoming is the fragmentation of this regime among numerous sectoral and geographically based bodies, *inter alia* the treaty regimes established under the IMO and Regional Fisheries Management Organisations (RFMOs) that result in spatial and substantive gaps as well as overlaps.[592] This is compounded by the fact that coordination and cooperation both within and across the various sectors is insufficient.[593]

In addition, many current and future maritime activities occurring on the high seas are not regulated at all or existing regulation is not to a sufficiently detailed level, e.g. marine scientific research, bioprospecting,[594] military activities, laying of cables and pipelines or the construction of various types of installations.

In the context of climate change mitigation, an issue highly relevant for the Arctic, the new approaches to sequester CO_2 need to be mentioned: Ocean iron

[588] Rosemary G. Rayfuse and Robin Warner, "Securing a sustainable future for the oceans beyond national jurisdiction: The legal basis for an integrated cross-sectoral regime for high seas governance for the 21st century," *International Journal of Marine and Coastal Law* 23, no. 3 (2008), 399–421, at 407.

[589] *Ibid*.; see Nilufer Oral, Protection of vulnerable marine ecosystems in areas beyond national jurisdiction: Can international law meet the challenge?, in: Strati, Anastasia, Gavouneli, Maria and Skourtos, Nikolaos, eds. *Unresolved Issues and New Challenges to the Law of the Sea*: *Time Before and Time After*. Leiden: Martinus Nijhoff Publishers, 2006, 85–108, at 86.

[590] See Julien Rochette and Raphaël Billé, "Governance of marine biodiversity beyond national jurisdictions: Issues and perspectives," *Ocean & Coastal Management* 51 (2008), 779–781, at 779.

[591] Rayfuse and Warner, *supra* note 588, at 400.

[592] Molenaar, *supra* note 561, at 95; Rayfuse/Warner, *supra* note 588, at 402.

[593] Rosemary Rayfuse, "Protecting Marine Biodiversity in Polar Areas Beyond National Jurisdiction," *Review of European Community & International Environmental Law* 17, no. 1 (2008) 3–13, at 7.

[594] Bioprospecting comprises "the search for and collection of genetic materials and their study with the goal of commercialization.", Harlan Cohen, "Some Reflections on Bioprospecting in the Polar Regions," in *Law*, *technology and science for oceans in globalisation*: *supra* note 222, 339–52, at 340; see David Leary, "Bi-polar Disorder? Is Bioprospecting an Emerging Issue for the Arctic as well as for Antarctica?," *Review of European Community & International Environmental Law* 17, no. 1 (2008), 41–55, at 41; Pamela L. Schoenberg, "A Polarizing Dilemma: Assessing Potential Regulatory Gap-Filling Measures for Arctic and Antarctic Marine Genetic Resource Access and Benefit Sharing," *Cornell International Law Journal* 42 (2009) 271–299.

fertilisation or at-depth injection of CO_2 are neither proven to be ecologically safe nor adequately regulated.[595]

Also of particular relevance for the Arctic high seas is the absence of a regime for coordination of activities between the high seas water column and the extended continental shelf of coastal states.[596]

The lack of requirement for prior EIA or the duty to monitor activities to ensure no harm occurs forms another major gap.[597] As displayed previously, there are also deficits concerning area-based management of the high seas, especially the establishment of a network of MPAs.[598]

In addition, the interests of non-user states that have no intention of engaging in exploitation generally receive little recognition in high seas management. The one exception is the IWC where non-user states may participate in decision-making and block the lifting of a moratorium on commercial whaling.[599]

f) No Regulatory Instrument for Transboundary Environmental Impact Assessment

Another deficit of the international regime governing the marine Arctic consists in the lack of a region-specific regulatory instrument for transboundary environmental impact assessment (TEIA). UNCLOS' environmental impact assessment provisions[600] are inadequate for guiding states in activities involving both national and trans-boundary effects.[601] Pursuant to Article 206 UNCLOS, States shall, as far as practicable, assess the potential effects of activities on the marine environment, when they have reasonable grounds for believing that planned activities under their jurisdiction or control may cause substantial pollution of or significant and harmful changes to the marine environment. It is not clear which circumstances are "reasonable grounds" for assuming the causation of "substantial pollution" or "significant and harmful changes to the marine environment" nor are there criteria

[595] Jeff Ardron et al., "Marine spatial planning in the high seas," *Marine Policy* 32, no. 5 (2008), 832–839, at 833; Rayfuse, *supra* note 593, at 6; *id*., Mark G. Lawrence and Kristina M. Gjerde, "Ocean fertilisation and climate change: The need to regulate emerging high seas uses," *International Journal of Marine and Coastal Law* 23, no. 2 (2008) 297–326, at 299 *et seq*..

[596] Rayfuse, *supra* note 593, at 7; Joanna Mossop, "Regulating Uses of Marine Biodiversity on the Outer Continental Shelf," in *Law*, *technology and science for oceans in globalisation*, *supra* note 222, 319–38; *id*., "Protecting Marine Biodiversity on the Continental Shelf Beyond 200 Nautical Miles," *Ocean Development & International Law* 38 (2007) 283–304, at 288.

[597] Rayfuse, Lawrence and Gjerde, *supra* note 595, at 323.

[598] Molenaar, *supra* note 560, at 106.

[599] *Ibid*., at 98.

[600] See articles 204 to 206 UNCLOS.

[601] Maki Tanaka, "Lessons from the Protracted MOX Plant Dispute: a Proposed Protocol on Marine Environmental Impact Assessment to the United Nations Convention on the Law of the Sea," *Michigan Journal of International Law* 25 (2004), 337–428, at 393.

defining these impacts. Furthermore, the duty to start the EIA procedure applies only "as far as practicable", providing scope to avoid the assessment.

More detailed provisions for particularly TEIA are laid down in Conventions other than UNCLOS. The chief TEIA Convention is the Espoo Convention.[602]

According to the Convention the Parties have to "take all appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impact from proposed activities".[603] The origin state for such a planned activity must ensure that an EIA procedure is undertaken if the planned activity is likely to cause adverse transboundary impacts to the environment under the jurisdiction of another contracting state. However, it should be noted that the Espoo Convention does not apply in cases of potential harm to the high seas.

The importance of EIA for activities in the Arctic Region was stressed as early as 1991 in the AEPS.[604] Following a Finnish initiative, the Arctic States adopted the 'Guidelines for Environmental Impact Assessment (EIA) in the Arctic' in 1997.[605] The Guidelines provide guidance on how to conduct EIAs under Arctic conditions.[606] Their aim is to provide "suggestions and examples of good practice to enhance the quality of EIAs and the harmonization of EIA in different parts of the Arctic."[607]

This wording hints at the main weakness of the Guidelines: their provisions are not legally binding.[608] In addition, *Koivurova* found out that persons who are responsible for Arctic EIA are hardly aware of the existence of the Guidelines, and even if they are, they rarely apply them.[609] Therefore, he concludes that "the instrument has not be[en] a success in practice".[610] One reason for this failure is the lack of a follow-up mechanism.[611]

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[602] See *supra* note 209.

[603] Article 2(1) Espoo Convention; the proposed activities include offshore hydrocarbon production, Appendix I, Nr. 15.

[604] Arctic Environmental Protection Strategy, *supra* note 13, p. 10: "Management, planning and development activities which may significantly affect the Arctic ecosystems shall: a) be based on informed assessments of their possible impacts on the Arctic environment, including cumulative impacts".

[605] Guidelines for Environmental Impact Assessment (EIA) in the Arctic, Arctic Environment Protection Strategy, Sustainable Development and Utilization, Finnish Ministry of the Environment, Finland 1997.

[606] Koivurova, "Implementing Guidelines for Environmental Impact Assessment in the Arctic," in *Theory and practice of transboundary environmental impact assessment*, ed. Kees Bastmeijer and Timo Koivurova, 151–74 (Leiden: Nijhoff, 2008), 151–74, at 154.

[607] Guidelines for Environmental Impact Assessment (EIA) in the Arctic, *supra* note 605, p. 5.

[608] This soft law approach was taken because of the multi-layered governance system in the Arctic, where several federal states divide powers between the federal and the regional level, see Koivurova, *supra* note 606, at 155.

[609] Koivurova, *ibid*; see also Lennon, *supra* note 81, at 34.

[610] Koivurova, *ibid*., at 165; *id*., *Environmental impact assessment in the Arctic*: *A study of international legal norms* (Saarbrücken, Germany: Lambert Academic Publishing, 2010), 265–275.

[611] *Id*., *supra* note 606, at 166.

This is especially worrisome because "EIA will likely become one of the crucial management tools in the Arctic".[612] In this region, assessment of potential impacts on the marine environment prior to the beginning of activities is essential to ensure environmental protection: Only in this way can the multitudinous threats resulting from climate change and competing economic undertakings on the sensitive Arctic environment be understood and their realisation mitigated.

2 Sector-Specific Deficits

Besides these overarching gaps in the regime for environmental protection in the marine Arctic, there are also numerous shortcomings within the individual sectors.

a) Shipping

The AMSA 2009 Report[613] found the main gaps in governance of Arctic shipping to be that "[t]here are no uniform, international standards for ice navigators and for Arctic safety and survival for seafarers in polar conditions [and that] there are no specifically tailored, mandatory environmental standards developed by IMO for vessels operating in Arctic waters."[614]

aa) No Binding Special Construction, Design, Equipment and Manning Standards (Yet)

As has been described above, navigation in Arctic waters is unique compared to shipping in all other oceans in the world due to long periods of darkness and difficult, increasingly unstable ice conditions. Safe navigation in ice-covered waters requires experienced and skilled ice navigators as well as specifically designed and constructed vessels.

The envisaged Polar Code will contain provisions on the design and structure of vessels operating in polar waters, possibly by referring to the "Unified Requirements for member societies addressing essential aspects of construction for ships of Polar Class" that have been developed by the International Association of Classification Societies (IACS).[615] These are currently by reference incorporated into the Guidelines.[616]

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[612] *Ibid.*, at 172.

[613] Arctic Marine Shipping Assessment 2009 Report, *supra* note 65, p. 2.

[614] *Ibid.*, p. 4.

[615] See IMO, Sub-Committee on Ship Design and Equipment, 54th session, Agenda item 13, 2 August 2010, Development of a Mandatory Code for Ships Operating in Polar Waters, Report of the correspondence group, Submitted by Norway, IMO Doc. DE 54/13/3, Annex.

[616] See footnote to number 7.1.1 Guidelines for Ships Operating in Polar Waters.

The Code will also address installations needed on board vessels operating in ice-covered waters, such as electrical and machinery installations.[617] While the correspondence group for the development of the Polar Code acknowledges that training requirements should generally be incorporated into the STCW Convention and Code, the Polar Code will "include some measures related to manning and training specific to polar operations".[618]

Currently, the "Guidelines for Ships Operating in Polar Waters" recommend that at least one ice-navigator who has satisfactorily completed an approved training programme in ice navigation be on board a ship sailing polar waters. Currently, most ice navigator training programs are *ad hoc* and not standardised.[619] The IMO has pledged to develop a model course for Ice Navigation,[620] but at present no such uniform standards have been carved out.

Furthermore, there are no particular international construction requirements for cruise ships operating in polar waters. However, the cruise ship industry has established a Cruise Ship Safety Forum for development of design and construction criteria for new vessels, but it is not clear yet how navigation in polar waters will be addressed.[621]

bb) No Comprehensive IMO Ships' Routeing System

As discussed, one of the risks attached to Arctic shipping is the disturbance of marine wildlife through noise or collisions.[622] Marine animals are particularly vulnerable during summer time, when many migrate north into the Arctic and aggregate in large numbers to feed and breed.[623]

However, no comprehensive ships' routeing system is in place that could help to avoid certain areas or prevent certain effects of shipping in the Arctic.[624] The IMO is the competent organisation for the establishment and adoption of routeing measures at the international level. Acknowledged routeing measures are areas to be avoided, traffic separation schemes, inshore traffic zones, precautionary areas, deep water routes and no anchoring areas.[625] Before the potential international shipping lanes in the Arctic become viable for a large number of vessels, a

[617] *Ibid.*

[618] *Ibid.*, para. 14.

[619] Arctic Marine Shipping Assessment 2009 Report, *supra* note 65, p. 68.

[620] See footnote to number 14.2 Guidelines for Ships Operating in Polar Waters.

[621] Arctic Marine Shipping Assessment 2009 Report, *supra* note 65, p. 68.

[622] *Ibid.*, p. 134.

[623] *Ibid.*

[624] *Ibid.*, p. 146.

[625] Julian Roberts, "Protecting Sensitive Marine Environments: The Role and Applications of Ships' Routeing Measurers," *International Journal of Marine and Coastal Law* 20, no. 1 (2005), 135–160.

comprehensive plan should be in place to reduce interference with marine wildlife to a minimum, at least during crucial development stages and to prevent the adverse effects of shipping in particularly vulnerable areas.[626]

cc) No Tailor-Made, Binding Environmental Standards for Vessels Operating in Arctic Waters

Concerning operational discharges and emissions from ships the above-mentioned minimum international standards that are referred to in UNCLOS are set out in MARPOL. Its general standards for vessel-source pollution do not prescribe a "zero discharge" standard for some pollutants detrimental for the marine environment, e.g. oily waste and garbage.[627] However, for the reasons listed above, the generally accepted minimum standards for vessel-source pollution are not sufficient to prevent damage to the Arctic marine environment. Stricter pollution standards are needed, favourably before shipping takes place on a larger scale. Although the proposed Polar Code will include mandatory provisions on discharge, the issues of black carbon emissions, the loss of harmful substances in packaged form (HSPF) and containers, and standards for discharges of sewage, grey water and sewage sludge were excluded from further consideration and will thus not be addressed.

Furthermore, within the Arctic coastal states EEZs, currently diverse and arguably inconsistent national standards are applied for regulating ship-source pollution in correspondence to Article 234 UNCLOS. However, since Arctic shipping will likely pass through the maritime zones of more than one state and the high seas, it is imperative that domestic legislation complies with uniform international standards, which should be developed cognisant of the special Arctic conditions.

Increasing international shipping in the Arctic Ocean also augments the risk of introduction of alien species and pathogens through the discharge of ballast water and through hull fouling.[628] The Ballast Water Convention[629] aims at the prevention, minimisation and ultimately, elimination of the transfer of Harmful Aquatic Organisms and Pathogens through the control and management of ships' Ballast Water and Sediments.[630] For this purpose, the Convention has provisions for

[626] So far, such measures have only been applied in certain areas of the marine Arctic, such as Alaska's Prince William Sound, Arctic Marine Shipping Assessment 2009 Report, *supra* note 65, p. 61.

[627] Aldo Chircop, "International Arctic Shipping: Towards Strategic Scaling-Up of Marine Environment Protection," in *Changes in the Arctic environment and the law of the sea*, *supra* note 3, 177–201, at 185.

[628] Arctic Marine Shipping Assessment 2009 Report, *supra* note 65, p. 69.

[629] International Convention for the Control and Management of Ships' Ballast Water and Sediments, concluded 13 February 2004, not yet in force, available at: http://www.austlii.edu.au/au/other/dfat/treaties/notinforce/2005/18.html, last visited 11 March 2011.

[630] Article 2 Ballast Water Convention.

management (i.e., exchange and treatment) of ballast water[631] and stipulates that each ship have and implement a Ballast Water Management plan on board. These are minimum standards, and member states may adopt stricter measures.[632] The highly specialised and relatively simple structure and vulnerability to invasive species of many Arctic marine systems means that higher-than-average regional standards—possibly similar to those contained in the "Practical Guidelines for Ballast Water Exchange in the Antarctic Treaty Area"[633]—are required.[634] This is of particular importance since the Ballast Water Convention has not yet entered into force.[635]

dd) Deficits of the Polar Code

According to the current state of affairs regarding the Polar Code as envisaged, the instrument will likely suffer from various deficits. As previously discussed, the Code falls short of including the whole Arctic marine area as well as all vessels operating in it. Furthermore, chances are that contentious issues and standards will only be inserted into the recommendatory part of the Code and thus not become legally binding. Also, as indicated, several issues of importance have been excluded from further consideration. In consequence, even if and when the Code enters into force, various issues of Arctic marine shipping will remain unresolved.

b) Oil and Gas Extraction

aa) No Adequate Control of Environmental Impacts of Petroleum Extraction

The regulation of environmental impacts of petroleum extraction suffers from a deficiency similar to that surrounding the governance of environmental impacts from shipping: The international standards[636] that set the minimum pollution standards for coastal state legislation do not take into account the special Arctic

[631] Annex, Regulation B-1 *et seqq*. Ballast Water Convention.

[632] Annex, Regulation C-1 Ballast Water Convention.

[633] Annex to Resolution 3 (2006), available at: http://www.ats.aq/documents/recatt/att345_e.pdf, last visited 11 March 2011.

[634] Arctic Marine Shipping Assessment 2009 Report, *supra* note 65, p. 69.

[635] The Ballast Water Convention enters into force 12 months after ratification by 30 States, representing 35 % of world merchant shipping tonnage, article 18(1) Ballast Water Convention. Of the Arctic States, Canada, Finland, Norway and Sweden have ratified the Convention, see http://www.ecolex.org/ecolex/ledge/view/RecordDetails;document_International%20Convention%20for%20the%20Control%20and%20Management%20of%20Ships'%20Ballast%20Water%20and%20Sediments.html?DIDPFDSIjsessionid=167D7E2111664A6934752FBD2636E386?id=TRE-001412&index=treaties, last visited 12 March 2011.

[636] Set by MARPOL 73/78.

conditions that require higher-than-average protection. Regional instruments setting Arctic-specific requirements exist only for the Atlantic wedge of the region.

There is a working group tasked with developing an international instrument on Arctic marine oil pollution preparedness and response. However, until a comprehensive instrument is in force, oil and gas extraction in the marine Arctic poses considerable, and potentially very severe risks.

bb) Lack of Competent Global or Regional Bodies

Furthermore, as only the OSPAR maritime area is covered by a regional body responsible for regulation of oil and gas extraction, large parts of the marine Arctic lack a competent organisation.[637] While the ISA has competence over exploration and exploitation of the likely small part of the Arctic seabed that will remain the Area, the remaining part of the Arctic also lacks an international body responsible for oil and gas extraction.

c) Fishing

Regarding fisheries, the main problem lies in the incomplete coverage of the marine Arctic by RFMOs. Large parts of the region do not fall under the spatial scope of any competent organisation; others are only managed with regard to a single species or a single group of species. Since RFMOs are assigned a crucial role in fisheries management, particularly of straddling and highly migratory fish species,[638] this is a considerable gap for the management of international fisheries in the marine Arctic.

3 Concluding Remarks and Outlook

As has been revealed by the preceding analysis, the international legal regime governing the marine Arctic suffers from various shortcomings, both within and across various sectors.

The legal basis for environmental protection in the marine Arctic is formed by UNCLOS and its implementing agreements that regulate all legal regimes and human activities on the seas and oceans. Having said that, it has to be kept in

[637] Koivurova and Molenaar, *supra* note 214, p. 42.

[638] See paras. 5(2)(a) and (b) United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (FSA), signed 4 August 1995, entry into force 11 December 2001, 2167 UNTS 88.

mind that UNCLOS is a framework Convention that has to be implemented regionally and that only sets a minimum standard with regard to environmental protection, which is by no means sufficient for adequate conservation of the Arctic marine environment.

Principally, the regimes UNCLOS establishes for the different maritime zones and the rights and obligations it lays down are the same in the Arctic as in all other parts of the world. However, article 234 UNCLOS on ice-covered waters was tailor-made for the region. It confers upon the coastal state the right to adopt and enforce regulations concerning marine pollution, where severe climatic conditions and the presence of sea ice so require. The provision raises several questions of interpretation, especially as regards its application to straits and the specific climatic conditions that must be present in an area to fall under its scope of application.

Another highly disputed question relating to UNCLOS' application to the marine Arctic concerns the Northwest Passage's character as an international strait. Applying the criteria that must be fulfilled for a sea route to qualify as international strait under UNCLOS, it can be found that the Northwest Passage currently lacks the necessary amount of ship traffic. However, considering the record-breaking retreat of sea ice and the consequent navigability of the Northwest Passage at least during summer time, it is only a matter of time until this criterion will be fulfilled. If and when the Passage transforms into an international strait, Canada as the coastal state would generally only retain limited power over foreign ships under the regime of transit passage. Yet, article 234 UNCLOS is arguably also applicable to international straits, thus augmenting the rights for adoption and enforcement of environmental provisions concerning the Northwest Passage.

Apart from UNCLOS, there are three different types of agreements applicable to the Arctic marine environment: treaties regulating certain geographic parts of the region, individual sectors of marine activity or single species within the marine Arctic. The region is accordingly regulated by a patchwork of applicable treaties that are generally unrelated and weakly coordinated and on top of that lack universal participation by all Arctic states. There is no single, overarching 'Arctic Treaty' governing the marine environment in the region.

This matter of fact already indicates one of the major weaknesses of the international regime for governance of the Arctic marine environment: the lack of integrated management. The governance regime is split up, thus lacking an overall perspective that would take into account interactions within and among natural systems. It also suffers from complications related to the fragmentation of international environmental law. The different treaties and agreements in this field of law were mainly created in response to specific environmental problems and with a narrow focus. As a consequence, conflicts of norms occur that can even result in mutually exclusive obligations. In addition, fragmentation poses a considerable impediment to effective protection of ecosystems as cumulative stressors regulated under different systems tend to be ignored. Furthermore, different human activities competing in a spatial and temporal sense are also regulated under different systems and therefore not harmonised and coordinated.

With regard to spatial measures, the governance regime for the Arctic marine environment also encounters shortcomings with regard to a network of MPAs. Very little of the area has until today been designated as MPA and there are no MPAs on the high seas at all.

Conservation of biodiversity on the high seas has recently moved to the centre of attention of the international community. Intensified uses of this part of the oceans along with the damages these provoked have shown that the current system based on the "freedom of the high seas" and principal reliance on flag state jurisdiction is inadequate to safeguard marine biodiversity. As the sea ice recedes and more high seas parts in the Arctic become accessible, the region will suffer from the combined weaknesses of the high seas regime: the mentioned open access character with almost exclusive flag state jurisdiction, legal and institutional fragmentation, unregulated activities, the lack of requirements for prior EIA and many more.

The situation in the marine Arctic seems to be particularly severe regarding the conservation and management of high seas fisheries. Both the regional soft law regime and the international 'hard law' appear to be ill prepared to tackle the existing and foreseeable upcoming difficulties. The main soft law body, i.e. the Arctic Council lacks an express mandate for the conservation and management of Arctic fish stocks and its members are opposed expanding the ambit of the council to cover the matter. The 'Ilulissat Declaration' does not mention fisheries management at all.[639] The only applicable regional Convention (OSPAR) does not deal with fisheries management, either.

Thus, management and conservation of high seas fish stocks in the Arctic Region are not addressed in an overarching manner at the regional level, although melting sea ice will very likely increase demands for greater foreign access by states which may not traditionally have had an interest in the region. This will probably particularly be the case regarding Arctic high seas fisheries.[640] This prospect is especially worrisome because "within ABNJ fishing most likely has the most adverse impacts of all human activities".[641]

Due to the lack of a regional Convention dealing with fisheries management and conservation in the (entire) Arctic, how the international framework will deal with high seas fisheries takes on increased relevance. Taking fisheries as an example, it becomes apparent that the international framework has considerable gaps and weaknesses that have particularly serious consequences for the Arctic.

In fact, the international legal regime for high seas fisheries is "an issue of current concern and activity within the international community".[642] More than

[639] See Ilulissat Declaration, *supra* note 107.

[640] Rothwell, *supra* note 580, at 244; Michael Distefano, "Managing Arctic Fish Stocks," *Sustainable Development Law & Policy* 8, no. 3 (2003), p. 13.

[641] Molenaar and Oude Elferink, *supra* note 400, at 6.

[642] David Freestone, High Seas Fisheries, Max Planck Encyclopaedia of Public International Law, Max Planck Institute for Comparative Public Law and International Law, Heidelberg and Oxford University Press 2010, para. 36.

two-thirds of the high seas and straddling fish stocks assessed and more than half of the highly migratory oceanic sharks are overexploited and depleted.[643] The major commercial fish species could collapse before the mid-century.[644] Therefore, "[h]igh seas fisheries are the quintessential example of a common property resource – and of the shortcomings of a common property regime."[645]

In addition, high seas fisheries governance provides a comprehensive example of the existing deficits of the international regime applicable to the marine Arctic illustrated in the preceding discussion, namely institutional and legal fragmentation, area-based management and the lack of consideration of the special Arctic conditions.

4 Deficits of the High Seas Fisheries Regime in the Arctic

a) Framework for High Seas Fisheries in the Arctic

To begin with, the international legal treaties and agreements applying to fisheries in the Arctic will be described to present the framework regulating Arctic fisheries along with its deficiencies.

aa) UNCLOS

UNCLOS is the chief international instrument establishing the general rights and duties of states for the conservation and sustainable use of marine living resources.[646]

Fishing is one of the high seas freedoms granted by Article 87 UNCLOS that ought to be exercised with "due regard for the interests of other States in their exercise of the freedom of the high seas."

Articles 116–120 of UNCLOS deal with the conservation and management of the living resources of the high seas. According to these provisions, all States have the right to engage in fishing on the high seas subject to three qualifications: Firstly, they must comply with their other treaty obligations,[647] which allow for states to restrict their freedom of fishing pursuant to cooperative fisheries regulations.

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[643] FAO, Fisheries and Agriculture Department, The State of World Fisheries and Aquaculture, 2006, Food and Agriculture Organization of the United Nations, Rome 2007, p. 33.

[644] B. Worm et al., "Impacts of Biodiversity Loss on Ocean Ecosystem Services," *Science* 314, no. 5800 (2006), 787–790, at 790.

[645] Rayfuse and Warner, *supra* note 591, at 407.

[646] Philippe Sands, *Principles of international environmental law*, 2nd ed. (Cambridge: Cambridge Univ. Press, 2003), at 568.

[647] Article 116 UNCLOS.

Secondly, states fishing on the high seas have to regard the rights and interests of coastal states as laid down in UNCLOS. Thirdly, states have to comply with the principles for exploitation on the high seas as stipulated in Articles 117–119 UNCLOS.

According to Article 117 UNCLOS states have to take measures for their nationals that are necessary for conservation of the high seas living resources, and cooperate with other states to achieve this end. This provision entails the basic principle of flag state jurisdiction with respect to high seas fishing vessels.[648] The almost exclusive jurisdiction of the flag state over vessels fishing in the high seas is a considerable restriction for effective conservation of high seas living resources. As all states enjoy the right to fish in the high seas, flag states often lack the willingness and capacity to effectively exercise jurisdiction over vessels engaged in the generally vast high seas areas.[649] The problems arising out of ineffective exercise of flag state jurisdiction have been addressed in various instruments in the past decades, but was not taken into account in drafting UNCLOS' provisions on conservation of high seas living resources.

Article 118 UNCLOS stipulates the obligation of cooperation between states exploiting the same living resources or engaged in exploitation in the same area with regard to conservation and management. However, this duty is a weak one, given that it does not stipulate which conservation measures have to be taken, nor how states should engage in cooperation or what form of cooperation they have to take.[650] In addition, the duty to cooperate does not imply the obligation to reach a successful outcome. To discharge the duty, it is sufficient for states to enter negotiations in good faith, which imply that they can continue fishing on the high seas without a cooperative conservation mechanism in place if negotiations fail.[651]

Some guidance on the conservation measures that have to be taken is provided by Article 119 UNCLOS, requiring states to take measures to "maintain or restore populations of harvested species at levels which can produce the maximum sustainable yield" and to take into consideration "the effects on species associated with or dependent upon harvested species".[652]

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[648] Ellen Hey, The regime for the exploitation of transboundary marine fisheries resources: The United Nations law of the Sea Convention Cooperation between states (Dordrecht: Nijhoff, 1989); Utrecht, Univ., Diss., 1989., p. 50.

[649] See Stuart B. Kaye, *International fisheries management*, International environmental law and policy series (The Hague: Kluwer Law International, 2001), p. 146.

[650] Shigeru Oda, "Fisheries under the United Nations Convention on the Law of the Sea," *American Journal of International Law* 77 (1983), 739–755, at 751.

[651] See Kaye, *supra* note 649, p. 149.

[652] "Remarkably, regional fisheries organizations are not assigned specific functions or competencies." Rüdiger Wolfrum, Volker Röhen and Fred L. Morrison, "Preservation of the Marine Environment," in *International*, *regional*, *and national environmental law*, ed. Fred L. Morrison and Rüdiger Wolfrum, 225–84 (The Hague; Boston: Kluwer Law International, 2000), at 235.

Several UNCLOS provisions also deal with fish species that are not only harvested on the high seas, but also within national zones. Article 63(2) UNCLOS on straddling stocks occurring either within one or more EEZs or within an EEZ and an adjacent high seas area stipulates that "the coastal State and the States fishing for such stocks in the adjacent area shall seek, either directly or through appropriate subregional or regional organizations, to agree upon the measures necessary for the conservation of these stocks in the adjacent area". Like the duty to cooperate with respect to conservation and management of high seas living resources, Article 63 (2) UNCLOS contains a mere *pactum de negotiando* that does not require a successful outcome.[653] Article 64 contains a similar hortatory obligation to cooperate in respect to highly migratory species such as tuna.[654] For anadromous stocks, i.e. stocks, which live in the sea and spawn in fresh water (such as salmon), UNCLOS generally prohibits fishing outside the EEZ "except in cases where this provision would result in economic dislocation for a State other than the State of origin".[655] In these exceptional cases, "States concerned shall maintain consultations with a view to achieving agreement on terms and conditions of such fishing giving due regard to the conservation requirements and the needs of the State of origin in respect of these stocks". Catadromous stocks, which live in fresh water but breed in salt water (e.g. eel), shall only be harvested within the EEZ, Article 67 (2) UNCLOS.

Sedentary species, i.e. "organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil",[656] occurring on the continental shelf are subject to the sovereign right to exploitation of the coastal state, Article 77 (1) UNCLOS. Highly relevant for the Arctic, this right naturally also applies to the extended continental shelf. The question is, however, to what extent the sovereign right of the coastal state can be exercised for the purpose of conserving sedentary species on the (extended) continental shelf.[657] Sovereign rights for the purpose of "exploring [the continental shelf] and exploiting its natural resources" imply the competence to prohibit any exploration or exploitation whatsoever,[658] and thereby to preserve the natural resources.[659] The right to prevent exploration and exploitation thus implicitly includes the less far-reaching right to regulate certain types of fishing activities, such as bottom trawling, which are conducted

[653] See Kaye, *supra* note 649, p. 158.

[654] Highly migratory species are listed in Annex I UNCLOS. Most of those species migrate large distances during their life cycle, traversing not only the EEZs of one or more states but also the high seas, see Churchill and Lowe, *supra* note 244, p. 311.

[655] Article 66(3) UNCLOS.

[656] Article 77(4) UNCLOS.

[657] Mossop, "Protecting Marine Biodiversity on the Continental Shelf Beyond 200 Nautical Miles", *supra* note 596, at 289.

[658] Article 77(2) UNCLOS.

[659] E.J Molenaar, "Unregulated Deep-Sea Fisheries: A Need for a Multi-Level Approach," *International Journal of Marine and Coastal Law* 19, no. 3 (2004), 223–246, at 245.

on the high seas above the continental shelf but could have adverse impacts on sedentary species.[660] However, the exercise of this right "must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other States", Article 78(2) UNCLOS.[661]

bb) UN Fish Stocks Agreement

Soon after UNCLOS entered into force it became apparent that its provisions for high seas fisheries were insufficient because they left "too much of the freedom of fishing intact".[662] Numerous fish stocks' collapses, e.g. of cod in the Northwest Atlantic or of pollock in the Bering Sea showed that further elaboration and specificity were needed.

To identify and assess problems relating to conservation of straddling and highly migratory fish stocks and to consider means for improving cooperation between states and to formulate appropriate recommendations, the UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks was convened in April 1993 on request of the UN General Assembly (UNGA).[663] It culminated in the adoption of the 'United Nations Agreement for the Implementation of the Provisions of the United Nations Convention for the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks'[664] (hereinafter: FSA). All Arctic States are parties to the Agreement.[665]

Its objective is "to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks through effective

[660] Moritaka Hayashi, "Global Governance of Deep-Sea Fisheries," *International Journal of Marine and Coastal Law* 19, no. 3 (2004), 289–298, at 293; Molenaar, "Addressing regulatory gaps in high seas fisheries," *International Journal of Marine and Coastal Law* 20, 3/4 (2005) 533–570, at 558.

[661] For an analysis of "justifiable interference" see *ibid*., pp. 559 *et seqq*.

[662] Ellen Hey, in *Developments in international fisheries law*. The Hague; Boston: Kluwer Law International, at 28 pointing out the problems of registration and re-registration of fishing vessels under flags of convenience and the non-participation in fisheries management regimes or the opting-out of fishing regulations by flag states.

[663] Tore Henriksen, Geir Hønneland and Are Sydnes, *Law and politics in ocean governance*: *The UN fish stocks agreement and regional fisheries management regimes* (Leiden: Nijhoff, 2006), p. 11.

[664] United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, New York, 4 August 1995, entered into force 11 December 2001, 2167 UNTS 88; all eight Arctic States have ratified the Agreement, see http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXI-7&chapter=21&lang=en, last visited 20 March 2011.

[665] See status at http://treaties.un.org/Pages/ViewDetails.aspx?src=UNTSONLINE&tabid=2&mtdsg_no=XXI-7&chapter=21&lang=en#Participants, last visited 10 April 2011.

implementation of the relevant provisions of [UNCLOS]", Article 2 FSA. Many provisions aim to facilitate the implementation of the relevant UNCLOS provisions by indicating specific measures to be taken.[666]

The FSA is basically made up of three pillars: conservation and management principles, compliance measures and dispute settlement. With regard to fisheries management, the FSA introduced new and progressive concepts. State Parties are *inter alia* required to apply the precautionary[667] and ecosystem approaches[668] to management and to ensure that measures are based on the best scientific evidence available.[669] Importantly, the FSA also elaborated on the duties of the flag state for which UNCLOS leaves considerable leeway. The prescribed measures include control of such vessels on the high seas by means of fishing licences, authorisations or permits; establishment of a national record of fishing vessels authorised to fish on the high seas; requirements for marking of fishing vessels and fishing gear for identification; requirements for recording and timely reporting of vessel position, catch of target and non-target species, fishing effort and other relevant fisheries data; requirements for verifying the catch of target and non-target species through such means as observer programmes, inspection schemes, unloading reports, supervision of transhipment and monitoring of landed catches and market statistics; monitoring, control and surveillance of such vessels, their fishing operations and related activities; regulation of transhipment on the high seas to ensure that the effectiveness of conservation and management measures is not undermined; and regulation of fishing activities to ensure compliance with subregional, regional or global measures, including those aimed at minimising catches of non-target species.[670]

In contrast to UNCLOS that—as has been illustrated—contains "only a few very general provisions regarding the role of regional organizations or arrangements for conservation and management of straddling and highly migratory fish stocks",[671] the FSA dedicates various articles to this issue, with the aim of enhancing the role of regional organisations or arrangements. Firstly, the FSA stipulates that States shall pursue cooperation regarding straddling and highly migratory fish stocks either directly or through appropriate subregional or regional fisheries management organisations or arrangements (RFMO/As).[672] Secondly, the Agreement prescribes that where such an organisation or arrangement has the competence to establish conservation and management measures for particular stocks, States fishing for these

[666] Moritaka Hayashi, "The 1995 UN Fish Stocks Agreement and the Law of the Sea," in *Order for the oceans at the turn of the century*, ed. Davor Vidas and Willy Østreng, (The Hague; Boston: Kluwer Law International, 1999), 37–56, at 38; Suarez, *supra* note 231, at 55.

[667] Articles 5(c), 6 FSA.

[668] See Article 5(d) and (e) FSA.

[669] Article 5(b) FSA.

[670] Article 18(3) FSA.

[671] *Ibid*., p. 66.

[672] Article 8(1) FSA.

stocks and relevant coastal states "shall give effect to their duty to cooperate by becoming members of such organisation or participants in such arrangement."[673] Most importantly, it establishes the rule that only those states that fulfil this specified obligation to cooperate or agree to apply the measures established by the relevant organisation or arrangement shall have access to the fishery resources concerned. In other words: "Only Those Who Play by the Rules May Fish."[674]

Concerning regions where no RFMO/A exists, the FSA stipulates that the relevant States cooperate "to establish such an organization or enter into other appropriate arrangements to ensure conservation and management of [the stocks concerned]".[675] The Agreement furthermore stipulates the minimum requirements for establishing RFMO/As, their functions, the rights of new members and standards of transparency.[676]

The third pillar of the FSA consists of the provisions dealing with the peaceful settlement of disputes.[677] The Agreement expands the scope of application of the dispute settlement procedures of UNCLOS to those States which would not be bound by the Convention itself making them applicable *mutatis mutandis* with respect to any dispute between States Parties to the Agreement relating to the interpretation or application of the FSA whether or not they are also parties to UNCLOS (Article 30(1) FSA). In the same manner, UNCLOS' dispute settlement provisions apply to any disputes between States Parties to the Agreement concerning the interpretation and application of the regional or global fisheries agreement relating to the two types of stocks regulated by the FSA.

This leads to an important restriction regarding the application of the FSA: It does not deal with all categories of stocks UNCLOS covers, but only with straddling and highly migratory fish stocks. The non-applicability to other fish stocks became particularly apparent as a result of bottom-fisheries targeted at deep-sea fish species that are frequently discrete high seas fish stocks.[678] UNGA Resolution No. 61/105 called upon states to apply "the precautionary approach and an ecosystem approach to the conservation, management and exploitation of fish stocks, including straddling fish stocks, highly migratory fish stocks and *discrete high seas fish stocks*".[679]

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[673] Article 8(3) FSA.

[674] David A. Balton, "Strengthening the Law of the Sea: The New Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks", *Ocean Development and International Law*, 27, 125–51, at 138.

[675] Article 8(5) FSA.

[676] See Articles 9–12 FSA.

[677] Michael W. Lodge and Satya N. Nandan, "Some Suggestions towards Better Implementation of the United Nations Agreement on Straddling Fish Stocks and Highly Migration Fish Stocks of 1995," *International Journal of Marine and Coastal Law* 20 (2005), 345–379, at 352.

[678] Molenaar, *supra* note 246, at 158.

[679] A/RES/61/105, 6 March 2007, Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of

In the Arctic, new fishing opportunities will probably also concern anadromous fish stocks.[680] The FSA does not apply to that kind of fish stocks, leaving only the (deficient) UNCLOS provisions.[681] Although fishing for anadromous stocks on the high seas is principally prohibited under UNCLOS, there are exceptions, creating gaps in the safeguarding of sustainable management of these fish stocks.

cc) FAO Compliance Agreement and Code of Conduct for Responsible Fisheries

The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas[682] (FAO Compliance Agreement) was initially aimed at coping with the problem of reflagging, i.e. the practice of vessel operators reflagging their fishing vessels with "flags of convenience", those from other countries or countries not party to fisheries agreements or arrangements and thus avoiding the obligation to comply with the relevant conservation or management measures.[683]

In 1992, an International Conference on Responsible Fishing in Cancun, Mexico,[684] Agenda 21[685] and an FAO Technical Consultation on High Seas Fishing,[686] called for measures to deter reflagging.[687] The FAO responded by producing two documents: the FAO Compliance Agreement and the Code of Conduct for responsible Fisheries[688] (Code of Conduct).

The text of the Compliance Agreement as adopted by the 27th Session of the FAO Conference was integrated into the Code of Conduct when the latter was

10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments, p. 5, *emphasis added*.

[680] Molenaar, *supra* note 246, at 165.

[681] Erik J. Molenaar and Robert Corell, "Arctic Shipping: Background paper," (Arctic Transform, 12 February 2009), p. 18; the same applies to shared fish stocks, *ibid*.

[682] Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on High Seas, Rome, 24 November 1993, International Legal Materials (1994), 33:968.

[683] Gerald Moore, "The FAO Compliance Agreement," in *Current fisheries issues and the Food and Agriculture Organization of the United Nations*, ed. Myron H. Nordquist and John N. Moore, 77–92 (The Hague; Boston: M. Nijhoff Publishers, 2000), at 78.

[684] Principle 13, Declaration of Cancun, International Conference of Responsible Fishing, Cancun, Mexico, May 6–8, 1992; reproduced in FAO, Papers presented at the Technical Consultation on High Seas Fishing, Rome 7–15 September 1992, Fisheries Report No. 484, Supplement, p. 71.

[685] Para. 17.52, Agenda 21, United Nations Conference on Environment & Development, Rio de Janeiro, Brazil, 3 to 14 June 1992.

[686] Para. 63, Legal Issues concerning high seas fishing, in: FAO, Papers presented at the Technical Consultation on High Seas Fishing, Rome 7–15 September 1992, Fisheries Report No. 484, p. 67.

[687] UN Doc. A/CONF. 151/15, annex.

[688] Code of Conduct for Responsible Fisheries, 1995, International Organizations and the Law of the Sea Documentary Yearbook, 11:700.

adopted in 1995. Unlike the other parts of the Code, the Compliance Agreement is a legally binding treaty. It did not enter into force until April 2003 upon receipt of the 25th instrument of acceptance. From the circle of Arctic States, Russia and Iceland have not ratified the Agreement.[689]

The Agreement is based upon two main elements: the concept of flag state responsibility with regard to vessels fishing on the high seas, and the exchange of information records about high seas fishing operations.[690]

The basic obligation of flag states under the Agreement is to take such measures as may be necessary to ensure that vessels flying their flags do not engage in any activity that undermines the effectiveness of international conservation and management measures (Article III(1)(a)). No party shall allow any fishing vessels entitled to fly its flag to be used for fishing on the high seas unless it has been authorised to be so used (Article III(2)), nor shall any party authorise any fishing vessel entitled to fly its flag to be used for fishing on the high seas unless the Party is satisfied that it is able, taking into account the links that exist between it and the fishing vessel concerned, to exercise effectively its responsibilities under this Agreement in respect of that fishing vessel (Article III(3). These rules presented a "new vision for high seas fisheries"[691] obligating flag states to effectively oversee the high seas fishing operations of vessels flying their flag and not to allow vessels flying their flag if they are not capable of effectively exercising responsibility over them. These principles had never been explicitly expressed in any international agreement, but they are derived directly from the more general provisions of UNCLOS.[692]

To deter reflagging, the Agreement stipulated that no party shall authorise any fishing vessel previously registered in the territory of another Party that has undermined the effectiveness of international conservation and management measures to be used for fishing on the high seas.[693] Thus, fishing vessels that were involved in illegal fishing should be restricted from seeking a new flag.

The second main pillar of the Agreement is an adequate flow of information on high seas fisheries[694] as stipulated in Articles IV through IX. States are required to establish and maintain a record of their fishing vessels authorised to fish on the high seas (Article IV), containing the information specified in Article VI. Article V is

[689] See http://www.fao.org/Legal/treaties/012s-e.htm.

[690] Hedley, C., FAO Compliance Agreement, in: International Agreements, Vol. 1, Section 1.3, Ocean Law Publishing, London 2008.

[691] David Balton, "Making the New Rules Work: Implementation of the Global Fisheries Instrument", in *Current Fisheries Issues and the Food and Agricultural Organization of the United Nations*, ed. Myron H. Nordquist and John Norton Moore, 107–135 (The Hague: Kluwer Law International, 2000), at 108.

[692] David A. Balton, "The Compliance Agreement," in *Developments in international fisheries law*, ed. Ellen Hey, 31–54 (The Hague; Boston: Kluwer Law International, 1999), at 49.

[693] Article III(5) FAO Compliance Agreement.

[694] Gerald Moore, "The Food and Agriculture Organisation of the United Nations Compliance Agreement," *International Journal of Marine and Coastal Law* 9 (1994), 412–425, at 414.

designed to promote cooperation among states in the implementation of the Compliance Agreement, especially through the exchange of information regarding the activities of high seas fishing vessels.

In October 1995, the FAO set up the High Seas Vessels Authorization Record (HSVAR) database that contains distinctive and descriptive elements of high seas fishing vessels as well as information on registration and authorisation status, infringements etc. However, only 20 out of the 38 parties to the Agreement have ever submitted data after acceptance. Only eight countries have maintained data that could be considered current, the most recent updates were made in 2009–2010. The frequency of the updates has varied widely depending on the parties, ranging from an annual basis to a monthly update to merely updating information whenever there has been some change in the status of given vessels.[695]

The Agreement applies generally to all fishing vessels that are used or intended for fishing on the high seas (Article II(1)), but parties may exempt vessels of less than 24 m in length (Article II(2))—a considerable limitation in the scope of application.[696]

It is open to acceptance by any Member or Associate Member of FAO, and to any non-member State that is a Member of the UN, or of any of the specialised agencies of the UN or of the International Atomic Energy Agency (Article X(1)). So far, 39 parties accepted the Agreement, among them Canada, the European Community, Norway, Sweden and the United States of America.[697] The Russian Federation has not yet accepted the Agreement. Unfortunately, main open registry states[698] have also not ratified the Agreement, thus weakening its impact.[699]

One factor limiting the effectiveness of the Compliance Agreement exists in the manifold exceptions to the main requirements and the considerable leeway that its provisions leave to flag states. For instance, a Party to the Compliance Agreement may authorise a fishing vessel that has undermined the effectiveness of international conservation and management measures if the party "has determined that to grant an authorization to use the vessel for fishing on the high seas would not undermine the object and purpose of this Agreement" (Article III(5)(d)). In

[695] The dataset presently contains 7 600 records, of which 6 169 correspond to vessels which appear as currently authorised to fish in the high seas, (data providers have not provided any reason, dates or data for deletion). The difference between the total number of records maintained in the dataset and the number of authorised vessels arises from the fact that historical information is being retained as part of the records (e.g., changes in flag, ownership, duplicate registries, and terminated authorisations), Information retrieved from FAO website, available at: www.fao.org, last visited 1 November 2010.

[696] Budislav Vukas and Davor Vidas, "Flags of Convenience and High Seas Fishing: The Emergence of a Legal Framework," in *Governing High Seas Fisheries* (see note 1017), 53–90, at 69.

[697] See United Nations Treaty Series Online Collection, Registration No. I-39486.

[698] See Judith Swan, FAO Fisheries Department, Fishing Vessels Operating Under Open Registers And The Exercise Of Flag State Responsibilities, Information And Options, Rome 2002, Appendix 1.

[699] Takei, *supra* note 568, p. 85.

addition, with regard to enforcement measures, the FAO Compliance Agreement leaves much to the discretion of the parties.[700]

The Compliance Agreement has been supplemented by the Code of Conduct for Responsible Fisheries in 1995. Despite the designation as Code, the instrument's provisions are voluntary (Article 1.1)[701] and do not prescribe any legal rights or obligations.[702]

The scope of the Code is very broad,[703] as it is "directed toward members and non-members of FAO, fishing entities, subregional, regional and global organizations, whether governmental or non-governmental, and all persons concerned with the conservation of fishery resources and management and development of fisheries, such as fishers, those engaged in processing and marketing of fish and fishery products and other users of the aquatic environment in relation to fisheries" (Article 1.2), covering "the capture, processing and trade of fish and fishery products, fishing operations, aquaculture, fisheries research and the integration of fisheries into coastal area management" (Article 1.3). The Code is a comprehensive instrument, providing principles and standards applicable to the conservation, management and development of all fisheries (Article 1.3).

The Code's ten objectives are listed in Article 2: The instrument aims to provide States with a frame of reference for responsible fisheries and at establishing guidelines on how to structure their fisheries legislation and institutional structures.[704] The 19 general principles laid down in Article 6 form the core of the Code.[705] Among other things, they call on states to conserve aquatic ecosystems; to prevent overfishing and excess fishing capacity; to base their conservation and management decisions for fisheries on the best scientific evidence available; to apply the precautionary approach; to ensure compliance with and enforcement of conservation and management measures and to establish effective mechanisms to monitor and control the activities; to exercise effective flag state control; to cooperate at subregional, regional and global levels through fisheries management organisations, or other arrangements or agreements and to promote awareness of responsible fisheries through education and training.

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[700] See e.g. the soft wording of article III(8) FAO Compliance Agreement.

[701] Except for the incorporated provisions of the Compliance Agreement, see *supra* note 682.

[702] Moore, *supra* note 683, at 89.

[703] William Edeson, "Towards Long-term Sustainable Use: Some Recent Developments in the Legal Regime of Fisheries," in *International law and sustainable development*: *Past achievements and future challenges*, ed. Alan E. Boyle and David Freestone, 165–204 (New York: Oxford University Press, 1999); David J. Doulman, "Code of Conduct for Responsible Fisheries," in *Current fisheries issues and the Food and Agriculture Organization of the United Nations*, *supra* note 683), 307–330, at 310; Moore, *supra* note 683, at 94.

[704] See Kaye, *supra* note 649, p. 222.

[705] *Ibid.*

dd) Agreement on Port State Measures to Prevent IUU Fishing

Illegal, unreported and unregulated (IUU) fishing[706] has long been identified as one of the main threats to the management and conservation of marine fisheries resources. The costs of current illegal and unreported fishing worldwide have been estimated to range between $10 bn and $23.5 bn annually, representing between 11 and 26 million tonnes.[707] Since combating IUU fishing has proven to be difficult, particularly as a result of flag States not exercising their responsibilities with regard to illegal operators, in recent years there has been an increasing global focus on the role of port state measures (PSM)[708] as an effective and cost-efficient means to fight IUU fishing.

Over the years, a range of PSM have been adopted by a number of RFMOs as well as by individual states and included into international instruments. Whereas UNCLOS addresses port state jurisdiction only to a limited extent,[709] fisheries-related PSM have been progressively developed, including by the adoption of the Compliance Agreement, the FSA and the Code of Conduct. Furthermore, in 2005, the FAO Committee on Fisheries (COFI) adopted the *FAO Model Scheme on Port State Measures to Combat Illegal, Unreported and Unregulated Fishing*,[710] which is a voluntary instrument providing minimum standards for a range of activities and requirements.

However, PSMA have not been applied coherently and IUU continues to pose a major challenge on sustainable management of fisheries, making the worldwide expansion and harmonisation of PSMA a necessary step. Acknowledging this, in 2007, COFI asked members to develop a new legally binding instrument on PSMA, based on the 2001 FAO *International Plan of Action to Prevent, Deter and*

[706] Illegal fishing means fishing that takes place when vessels operate in violation of the applicable laws and regulations. Unreported fishing refers to fishing that has been unreported or misreported in contravention of applicable laws and regulations. Unregulated fishing is fishing in areas where there are no conservation and management measures in place, see paragraph 3 of the 2001 FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU), Rome 2001, available at: ftp://ftp.fao.org/docrep/fao/012/y1224e/y1224e00.pdf, last visited 3 September 2011.

[707] David J. Agnew et al., "Estimating the Worldwide Extent of Illegal Fishing," *PLoS ONE* 4, no. 2 (2009), e4570.

[708] PSM are requirements established or interventions undertaken by port states which a foreign fishing vessel must comply with or is subjected to as a condition for use of ports within the port state, see A. Skonhoft, Database on Port State Measures, FAO Fisheries and Aquaculture Department, available at: http://www.fao.org/fishery/psm/en, last visited 3 November 2010.

[709] The development and implementation of PSM is principally a sovereign decision of each state because they exercise full sovereignty over their ports, with just few minor exceptions, see Articles 25 and 218 UNCLOS.

[710] FAO, Model Scheme on Port State Measures to Combat Illegal, Unreported and Unregulated Fishing, Rome 2007, available at: ftp://ftp.fao.org/docrep/fao/010/a0985t/a0985t00.pdf, last visited 3 September 2011.

Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU)[711] and the 2005 FAO Model Scheme.

The "Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing" (PSMA) was approved by the FAO Conference on 22 November 2009.[712] At the time of writing, it had been signed by 24 states plus the European Union. Among the signees are the Arctic states Canada, Iceland, Norway, the Russian Federation and the United States of America.[713] The PSMA shall enter into force 30 days after the 25th ratification, acceptance, approval or accession.[714]

The objective of the Agreement is to "prevent, deter and eliminate IUU fishing through the implementation of effective port State measures, and thereby to ensure the long-term conservation and sustainable use of living marine resources and marine ecosystems" (Article 2). It applies to fishing conducted in marine areas that is illegal, unreported or unregulated[715] and to fishing related activities in support of such fishing.[716] The parties shall generally apply the PSMA to any vessel not entitled to fly their flag that is seeking entry to their ports or is in one of their ports.[717]

The PSMA provides minimum standards for port state measures.[718] Its provisions include prohibiting known or suspected IUU vessels from entry to ports or use of port services[719]; improving information sharing of details on IUU associated vessels[720]; standardising requirements for information from vessels seeking entry to ports[721]; standardising vessel inspections[722] and training of inspectors[723]; and providing assistance to developing countries for their implementation of the instrument.[724]

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[711] FAO, International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing Rome 2001, available at: ftp://ftp.fao.org/docrep/fao/012/y1224e/y1224e00.pdf, last visited 3 September 2011.

[712] FAO, Thirty-sixth Session, Resolution No 12/2009, available at: http://www.fao.org/Legal/treaties/037s-e.htm, last visited 4 November 2010.

[713] See FAO, Legal Office, available at: http://www.fao.org/Legal/treaties/037s-e.htm, last visited 4 November 2010.

[714] Article 29 PSMA.

[715] IUU fishing refers to the activities set out in paragraph 3 IPOA-IUU, *supra* note 706.

[716] Article 3(3) PSMA.

[717] Article 3(1) PSMA.

[718] The PSMA does in particular not affect the right of parties to adopt more stringent PSM (Article 4(1)(b)).

[719] Article 9(4) PSMA.

[720] Articles 6, 16 PSMA.

[721] Article 8, Annex A PSMA.

[722] Article 13, Annex B PSMA.

[723] Article 17, Annex E.

[724] Article 21 PSMA.

If the Agreement gains wide ratification, it might indeed be considered as "a milestone in the international efforts to ensure responsible and sustainable fisheries" as acclaimed by its creators.[725] The first ever global treaty focused particularly on the problem of IUU fishing will, however, only be really effective in combating the problem, if it is enforced across the world and thus leaves no loophole for landing of IUU catches.[726] Furthermore, it has to be kept in mind that PSM are not a universal remedy for conservation measures: Port state controls are not capable of ascertaining whether certain types of conservation measures have been violated at sea.[727] Thus, complementary measures remain crucial.

ee) International Guidelines for the Management of Deep-Sea Fisheries in the High Seas

In recent years, fishing activities have plunged deeper and deeper into the world's oceans. The strong increase in deep-water fishing[728] is mainly a consequence of the depletion of many traditional stocks, aggravated by over-capacity of international fishing fleets and a growing worldwide demand for fish, and technological progress, which made the deep-sea resources accessible.[729]

There is no single definition for "deep-sea fisheries" (DSFs).[730] Mostly, DSFs have been defined as fisheries that occur below the continental shelf, i.e. below the 200 m mark.[731] ICES considers those fisheries that take place in waters deeper than about 400 m to be DSFs.[732]

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[725] See recital no. 7(2) PSMA.

[726] See Erik J. Molenaar, "Port state jurisdiction to combat IUU fishing: the Port State Measures Agreement," in *Recasting transboundary fisheries management arrangements in light of sustainability principles*: *Canadian and international perspectives*, ed. Dawn A. Russell and David VanderZwaag, 369–86, Legal aspects of sustainable development (Leiden: Martinus Nijhoff, 2010), at 373.

[727] Rosemary G. Rayfuse, "To our children's children's children: From promoting to achieving compliance in high seas fisheries," *International Journal of Marine and Coastal Law* 20, 3/4 (2005), 509–532, at 528.

[728] According to the FAO, "[f]rom 1950 to 1977, DSF represented less than 1 % of the entire maritime catch. In the period between 1995 and 2005 the percentage grew to nearly 3 per cent and in 2005 it represented 4 per cent of the total maritime catch, which amounted to 3.3 million tonnes". Accordingly, the DSF total catch increased by nearly 75 per cent, see Analia Murias, FAO Focuses on Improving Deep Sea Fisheries Management, Fish Information and Service, http://fis.com/fis/worldnews/worldnews.asp?l=e&ndb=1&id=27450, last visited 16 November 2010.

[729] See Erik J. Molenaar, *supra* note 659, at 223.

[730] See D.W. Japp,/S. Wilkinson, Deep-sea resources and fisheries, in: FAO Fisheries Report No. 838, FIEP/R838, Report and documentation of the expert consultation on deep-sea fisheries in the high seas, Bangkok, Thailand, 21–23 November 2006, p. 39.

[731] See DEEP SEA 2003 Conference, Queenstown, New Zealand, 1–5 December 2003.

[732] See Odd Aksel Bergstad/John D. M. Gordon,/Philip Large, Is time running out for deep sea fish?, available at: http://www.ices.dk, last visited 9 November 2010.

DSF fish species are often long-lived, late maturing, slow-growing, and of low fecundity. Many also aggregate on restricted topographic features such as seamounts. Consequently, DSF species are "notably unproductive, highly vulnerable to overfishing, and have potentially little resilience to overexploitation".[733]

Bottom-trawling in particular has been recognised as a destructive fishing practice extremely detrimental to deep-sea ecosystems, including seamounts, hydrothermal vents and cold water corals.

In the well-noted Resolution 61/105, the UNGA addressed international concerns regarding the adverse impacts of deep-sea fisheries on cold-water corals, sponges, seamounts and other types of vulnerable benthic ecosystems and species, including species of fish, found in the deep-sea.[734] The resolution failed to include a ban on bottom trawling although that had been supported by some states.[735] It called on States and RFMOs to regulate high seas bottom fisheries through conducting impact assessments to determine whether significant adverse impacts (SAIs)[736] to Vulnerable Marine Ecosystems (VMEs)[737] would occur. Moreover, it required that areas of the high seas where VMEs were known or likely to occur should be closed to fishing unless such fisheries could be managed to prevent SAIs. High-seas fisheries should also be managed to ensure the long-term sustainability of deep-sea fish stocks whether they were the targeted species or otherwise impacted, for example, caught as by-catch.[738]

Furthermore, the FAO was invited to improve data collection and dissemination, promote information exchange and increased knowledge of deep sea fishing activities, develop standards and criteria for use by States and RFMO/As in identifying VMEs and the impacts of fishing on such ecosystems, and to establish standards for the management of deep sea fisheries.[739] The FAO convened an expert consultation to prepare draft technical guidelines including standards for the management of deep-sea fisheries in the high seas in Bangkok, Thailand, in September 2007 and two Technical Consultations in Rome in February and August 2008, to "discuss the

[733] J. Koslow, "Continental slope and deep-sea fisheries: implications for a fragile ecosystem," *ICES Journal of Marine Science* 57, no. 3 (2000), 548–557, at 548.

[734] UNGA Res. 61/105, UN Doc. A/RES/61/105 (December 8, 2006), paragraph 80.

[735] UNGA, Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting, Letter dated 14 July 2006 from the Co-Chairpersons of the Consultative Process addressed to the President of the General Assembly, A/61/156, para. 100.

[736] 'Significant adverse impacts' are impacts jeopardising the integrity of ecosystems by reducing the ability of populations to replace themselves, by reducing the productivity of habitats or by causing significant loss of species richness, habitat or community types, see para. 17 International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, FAO, Rome, 2008.

[737] 'Vulnerable marine ecosystems' are ecosystems that are likely to be disturbed and slow to recover, see para. 14 International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, *ibid*.

[738] UNGA Res. 61/105, UN Doc. A/RES/61/105 (December 8, 2006), paragraph 83(a) to (d).

[739] *Ibid*., paragraph 89.

Guidelines from a policy perspective and finalize the document".[740] The "International Guidelines for the Management of Deep-sea Fisheries in the High Seas"[741] were adopted at the second meeting in Rome.[742]

They aim to provide

> tools [. . .] to facilitate and encourage the efforts of States and RFMO/As towards sustainable use of marine living resources exploited by deep-sea fisheries, the prevention of [SAIs] on deep-sea VMEs and the protection of marine biodiversity that these ecosystems contain.[743]

The Guidelines have been developed for deep-sea fisheries occurring in ABNJ (Section 2, no. 8). In the sense of the Guidelines, DSFs are present, if two criteria are met: the total catch has to include species that can only sustain low exploitation rates and the fishing gear has to have a high probability of contacting the seafloor during the normal course of fishing operations (Section 2, no. 8, i. and ii). The Guidelines thus do not use a specific depth to qualify DSFs, despite likely contact being dependent on the depth of equipment being used. Instead emphasis is given to the vulnerability of the species in question, rather than the depth at which they are caught.[744]

Generally, the Guidelines request the establishment and implementation of policy, legal and institutional frameworks for the effective management of deep-sea fisheries.[745] They call for strengthening the capacity of existing RFMOs with the competence to manage deep-sea fisheries and for cooperation in the establishment of new RFMOs to regulate bottom fisheries.[746] Furthermore, the Guidelines include the identification of key management and conservation steps relating *inter alia* to data collection, reporting and assessment[747] or the identification of VMEs and the assessment of SAIs.[748]

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[740] International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, *supra* note 736, preamble, no. 3.

[741] *Ibid.*

[742] Report of the Technical Consultation on International Guidelines for the Management of Deep-sea Fisheries in the High Seas. Rome, 4–8 February and 25–29 August 2008, FAO, Rome 2009, Annex F.

[743] International Guidelines for the Management of Deep-Sea Fisheries in the High Seas, *supra* note, no. 6.

[744] In the Description of Key Concepts for DSFs, the Guidelines name characteristics of deep-sea fish species. "These include (i) maturation at relatively old ages; (ii) slow growth; (iii) long life expectancies; (iv) low natural mortality rates; (v) intermittent recruitment of successful year classes; and (vi) spawning that may not occur every year." Therefore, "many deep-sea marine living resources have low productivity and are only able to sustain very low exploitation rates", Section 3, no. 13.

[745] Para. 26 International Guidelines for the Management of Deep-sea Fisheries in the High Seas, *supra* note 736.

[746] Paras. 27–28, *ibid.*

[747] Paras 31 et seqq., *ibid.*

[748] Paras. 42 et seqq., *ibid.*

The Guidelines constitute an important step to sustainable management of DSFs in ABNJ. However, their effectiveness relies on their successful implementation. In this respect, the Guidelines depend on the commitment of the member states. They do not provide for any means of outside enforcement, but urge member states that they "should" take actions to manage DSFs.[749]

ff) Convention on Biological Diversity

The Convention on Biological Diversity (CBD)[750] has as its core objectives the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.[751] Biological diversity is defined as "the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems".[752]

The CBD is a framework Convention that defines the obligations of its parties in broad terms that must be given more detail by national actions or other international agreements.[753] A guiding principle under the CBD is that states have the sovereign right to exploit their own resources according to their environmental policies, and the responsibility to make sure that activities within their jurisdiction or control do not cause damage to the environment of other States or of *areas beyond the limits of national jurisdiction*.[754] With respect to biological components, the Convention applies only within the limits of national jurisdiction.[755] For processes and activities performed under the jurisdiction or control of contracting parties however, it

[749] *Ibid*., p. 996; in May 2010, the FAO held a workshop on the implementation of the guidelines, see Report of the FAO Workshop on the Implementation of the FAO International Guidelines for the Management of Deep-Sea Fisheries in the High Seas – Challenges and Ways Forward, Busan, 10–12 May 2010. At the time of the workshop, however, "most states and RFMO/As ha[d] only recently started to address many of the provisions in the FAO Deep-sea Guidelines with a view to their implementation. In May 2010, RFMO/As were still at an early stage of the implementation process and thought it premature to evaluate the effectiveness of the measures already taken.", *ibid*., p. 4. Therefore, no comprehensive review of implementation of the Guidelines has taken place yet.

[750] Convention on Biological diversity, Rio de Janeiro, adopted 5 June 1992, entered into force 29 December 1993 and ratified by 193 parties, among them Finland, Sweden, Norway, Denmark, Iceland, Canada and the Russian Federation. The United States has signed the Convention in 1993, but has not yet ratified it. The text of the Convention can be found in (1992) 31 I.L.M. 822–841.

[751] Article 1 CBD.

[752] Article 2 CBD.

[753] Alison Rieser, "International Fisheries Law, Overfishing and Marine Biodiversity," *The Georgetown International Environmental Law Review* 9 (1996–1997), 251–280, at 256.

[754] Article 3 CBD; emphasis added.

[755] Article 4(a) CBD.

applies within areas of national jurisdiction or beyond the limits of national jurisdiction, regardless where the effect occurs.[756]

The CBD also requires its parties to cooperate directly, or through competent international organisations, in respect of ABNJ, for the conservation and sustainable use of biological diversity.[757] They shall furthermore integrate the conservation and sustainable use of biodiversity into relevant sectoral or cross-sectoral plans, programmes and policies and develop national strategies, plans or programmes for it. Additionally, the parties must take in-situ[758] and ex-situ conservation measures,[759] like the establishment of protected areas, the protection of ecosystems, the rehabilitation and restoration of degraded ecosystems, and the recovery of threatened species.[760]

However, all obligations under the CBD leave a great deal of flexibility, applying "as far as possible and as appropriate"[761] or "in accordance with [...][the party's] particular conditions and capabilities"[762] and are thus weakened considerably.[763] Therefore, the responsibility and discretion for achieving the CBD's main objectives rests mainly with its contracting parties.[764]

The three main bodies established by CBD are the Conference of the Parties (COP),[765] the Secretariat[766] and the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA).[767] The first meeting of the SBSTTA established a working group on marine and coastal biodiversity. In the recommendations issued at the meeting[768] the sustainable use of coastal and marine living resources is

[756] Article 4(b) CBD.

[757] Article 5 CBD.

[758] Article 8 CBD; 'in-situ conservation' means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties, Article 2 CBD.

[759] Article 9 CBD; 'ex-situ conservation' means the conservation of components of biological diversity outside their natural habitats, article 2 CBD. Ex-situ conservation is usually complementary to in-situ conservation, Sands, *supra* note 646, p. 518.

[760] See articles 8 and 9 CBD.

[761] See articles 5, 7–11 CBD.

[762] See article 6 CBD.

[763] Rüdiger Wolfrum, "The Protection and Management of Biological Diversity," in *International, regional, and national environmental law*, *supra* note 652, 355–72, at 359.

[764] John C. Kunich, "Losing Nemo: The Mass Extinction Now Threatening the World's Ocean Hotspots," *Columbia Journal of Environmental Law* 30, no. 1 (2005), 1–134, at 59.

[765] Article 23 CBD.

[766] Article 24 CBD.

[767] Article 25 CBD.

[768] The final work of this meeting contained more than 50 recommendations, which were supported by the second COP. The recommendations concern five thematic issues: integrated marine and coastal management; marine and coastal protected areas; sustainable use of coastal and marine living resources; mariculture; and the introduction of alien species.

addressed.[769] Together with the ensuing decision adopted by the Second Meeting of the COP on a programme of action for implementing the CBD with respect to marine and coastal biodiversity and the Ministerial Statement, adopted at the same meeting, they constitute the so-called "Jakarta Mandate on Marine and Coastal Biodiversity".[770] It was considered as a new international consensus on the importance of marine and coastal biological diversity. The recommendations and decision of the Jakarta Mandate show that coastal and marine biodiversity was on the agenda of the COP since its early days.

At the eighth COP the issue of conservation and sustainable use of high-seas biodiversity, specifically deep seabed genetic resources beyond the limits of national jurisdiction was taken up. The COP requested Parties and urged other States, to take measures to manage activities and processes under their jurisdiction and control, which may have SAIs on deep seabed ecosystems and species in ABNJ. At the same meeting, COP expressed its concern over the range of threats in ABNJ, including the impact of destructive fishing practices and illegal, unreported and unregulated fishing. It was recognised that MPAs are an essential tool for furthering conservation and sustainable use of biodiversity in these areas. Furthermore, it was acknowledged that the CBD has a chief role in supporting the work of the UNGA with respect to MPAs beyond national jurisdiction.

The CBD stipulates that Contracting Parties shall implement the Convention with respect to the marine environment consistently with the rights and obligations of States under the law of the sea.[771] The consistency condition suggests that the law of the sea prevails in cases of conflict of norms.[772] However, the provisions of the CBD can be seen as an elaboration of the general principles of UNCLOS on conservation of the marine environment. Such a furtherance of principles is explicitly recognised by and thus perfectly compatible with UNCLOS.[773]

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[769] Conference of the Parties to the Convention on Biological Diversity, Second meeting, Jakarta, 6–17 November 1995, Report of the First Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice, UNEP/CBD/COP/2/5, 21 September 1995, Recommendation I/8: Scientific, technical and technological aspects of the conservation and sustainable use of coastal and marine biological diversity.

[770] Conference of the Parties to the Convention on Biological Diversity, Second meeting, *supra* note, Decision II/10: Conservation and Sustainable Use of Marine and Coastal Biological Diversity and The Jakarta Ministerial Statement on the Implementation of the Convention on Biological Diversity, Annex; furthermore, decision II/10 contains two Annexes that form an integral part of the decision. Annex I contains additional conclusions on the SBSTTA Recommendation I/8. Annex II entails a draft programme for further work on marine and coastal biodiversity.

[771] Article 22(2) CBD; the law of the sea includes both customary international law of the sea and the provisions of UNCLOS, see Christopher C. Joyner, "Biodiversity in the Marine Environment: Resource Implications for the Law of the Sea," *Vanderbilt Journal of Transnational Law* 28 (1995), 635–687, at 650.

[772] Lyle Glowka, A guide to the Convention on Biological Diversity: A contribution to the global biodiversity strategy, IUCN environmental policy and law paper (Gland: IUCN, 1994), p. 109.

[773] Article 237(1) UNCLOS; see Convention on Biological Diversity, Subsidiary Body on Scientific, Technical and Technological Advice, Eighth meeting, Montreal, 10–14 March 2003, Marine and

b) Shortcomings of the International Legal Regime for High Seas Fish Stocks

All the global instruments listed here related to fisheries conservation and management are applicable to the marine Arctic. This means, however, that their shortcomings apply as well. As seen in the legal instruments relevant for high seas fish stocks conservation and management, there are still substantive shortcomings.

aa) UNCLOS Provisions Insufficient

The analysis of UNCLOS' provisions for high seas fisheries showed they provide no adequate regime for conservation and management of these living resources. The traditional principle of freedom of the high seas has only been slightly modified by UNCLOS, which recognised the principle that all states have the right for their nationals to engage in fishing on the high seas, albeit subject to the state's treaty obligations and the rights, duties and interests of coastal states, as established in other articles of UNCLOS.[774] States have to take measures to conserve living resources on the high seas, either alone or in cooperation with other states, and a duty to negotiate with a view to creating regional or subregional fisheries organisations to establish the necessary conservation measures.[775]

However, UNCLOS provides too little guidance on the conservation measures to be taken and does not prescribe sufficiently detailed minimum standards. Likewise, although UNCLOS encourages states to cooperate in managing high seas fish stocks, it lacks standards for developing or operating respective organisations. In addition, the Convention relies entirely on flag state enforcement.[776]

bb) Incomplete Coverage of all High Seas Fish Stocks by the FSA

As described, the FSA elaborates on UNCLOS provisions and specifies the duties set out for conservation and management of high seas fish stocks. However, its limited scope leaves a considerable gap: The FSA does not apply to fish stocks that

Coastal Biodiversity: Review, further elaboration and refinement of the Programme of Work, Study of the relationship between the Convention on Biological Diversity and the United Nations Convention on the Law of the Sea with regard to the conservation and sustainable use of genetic resources on the deep seabed (decision II/10 of the Conference of the Parties to the Convention on Biological Diversity), Note by the Executive Secretary, UNEP/CBD/SBSTTA/8/INF/3/Rev.1,22 February 2003, p. 7.

[774] See Julie R. Mack, "International Fisheries Management: How the U.N. Conference on Straddling and Highly Migratory Fish Stocks Changes the Law of Fishing on the High Seas," *California Western International Law Journal* 26 (1995–1996), 313–333, at 317.

[775] Article 118 UNCLOS.

[776] See Rieser, "International Fisheries Law, Overfishing and Marine Biodiversity, *supra* note 753, at 271.

are not straddling or highly migratory stocks. This means, firstly that discrete high seas fish stocks are beyond its scope, which implies a lack of protection in particular for deep-sea fish species that are endangered through bottom fishing. Although the application of the FSA to discrete high seas fish stocks has been encouraged by the UNGA and at the FSA Review Conference, there is no legal obligation to do so.

Secondly, as noted above,[777] the FSA does not apply to shared and anadromous species, to which new fishing opportunities in the Arctic are also likely to relate to.

cc) Insufficient Participation in Relevant Instruments

Another weakness of the international regime for conservation and management of high seas fish stocks relates to the incomplete participation of states in major instruments. While UNCLOS has been ratified by 162 states and is thus virtually universally applicable, the FSA has to date only attracted 78 parties.[778] Although all Arctic States are parties to it, the low number of ratifications still creates considerable risks for Arctic fish stocks, as important long-distance fishing nations are not parties.[779]

In a similar manner, participation in the FAO Compliance Agreement and other fisheries-related instruments is insufficient, with the consequence that standards are not applied universally.

c) Deficits of the Institutional Framework for Fisheries in the Arctic

The dependency of management and conservation of high seas fish stocks on cooperation among states, especially via competent organisations leads to an examination of the deficiencies of the various institutions when assessing the adequacy of the international regime concerning high seas fisheries in the Arctic.

Fisheries bodies relevant for Arctic fisheries include global organisations, RFMOs and bilateral fisheries bodies.

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[777] See *supra* V. 4. a) bb).

[778] UN Division for Oceans and the Law of the Sea, Chronological lists of ratifications of, accessions and successions to the Convention and the related Agreements as at 03 June 2011, available at: http://www.un.org/depts/los/reference_files/chronological_lists_of_ratifications.htm#Agreement%20for%20the%20implementation%20of%20the%20provisions%20of%20the%20Convention%20relating%20to%20the%20conservation%20and%20management%20of%20straddling%20fish%20stocks%20and%20highly%20migratory%20fish%20stocks, last visited 12 September 2011.

[779] Lodge and Nandan, *supra* note 677, at 354.

aa) Relevant Global Organisations Concerning Fisheries

The institutional global governance structure for fisheries consists of the UNGA and the FAO with its Fisheries Commission.[780]

(1) United Nations General Assembly (UNGA)

The UNGA is the principal representative and policymaking body of the UN.[781] Annually, it adopts two resolutions relating to the management of straddling and highly migratory fish stocks: one each for oceans and fisheries. Furthermore, other resolutions dealt with issues such as large-scale pelagic driftnet fisheries[782] and fisheries bycatch and discards.[783]

In 2005, the UNGA called on States to ratify and to accede to FSA and the FAO Compliance Agreement.[784] Furthermore, States were urged to control high seas fishing operations by vessels flying their flags and to apply the precautionary and the ecosystem approach.[785] Particular emphasis was put on the issue of IUU fishing. In this respect, States are especially asked to establish a "genuine link" between the flag State and the vessel flying its flag and to improve port-State controls.[786] In addition, RFMOs and States are urged to establish mandatory vessel monitoring, control and surveillance systems for fishing vessels as well as to take action against fleet overcapacity. Moreover, UNGA calls upon observance of the resolutions on driftnet-fishing and bycatch and discards. Notably, the Resolution also encouraged

[780] See Hayashi, *supra* note 660, at 297.

[781] It was established in 1945 under the Charter of the UN and comprises all 192 Members of the UN. Its resolutions are "formal expressions of the opinion or will of United Nations organs", United Nations Dag Hammarskjöld Library, General Assembly: Resolution/Decisions", United Nations Documentation: Research Guide, available at: http://www.un.org/Depts/dhl/resguide/gares.htm, last visited 3 February 2011. According to the Charter of the UN, the General Assembly may, inter alia, discuss and make recommendations on any questions within the scope of the Charter or affecting the powers and functions of any organ of the UN, except where a dispute or situation is currently being discussed by the Security Council, make recommendations on it and initiate studies and make recommendations to promote, inter alia, international political cooperation, and the development and codification of international law, Article 10 and 13 Charter of the United Nations, signed 26 June 1945, San Francisco, entered into force on October 24, 1945, 1 UNTS XVI.

[782] UN General Assembly, Large-scale pelagic drift-net fishing and its impact on the living marine resources of the world's oceans and seas, UN Doc. A/RES/46/215, adopted 20 December 1991.

[783] UN General Assembly, Fisheries by-catch and discards and their impact on the sustainable use of the world's living marine resources, UN Doc. A/RES/49/118, adopted 19 December 1994.

[784] UN General Assembly, Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments, UN Doc. A/RES/60/31, 29 November 2005, para. 9.

[785] *Ibid.*, paras. 2 and 63–82.

[786] *Ibid.*, paras. 38 and 36/42.

States to recognise that the general principles of FSA not only apply to straddling and highly migratory fish stocks, but also to discrete fish stocks.[787]

In 1999, UNGA established the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea (UNICPOLOS) to facilitate the annual review of developments in ocean affairs and the law of the sea. They began by considering the relevant report of the Secretary-General and suggesting particular issues for consideration, highlighting areas where coordination and cooperation at the intergovernmental and inter-agency levels should be strengthened.[788]

In 2005, UNGA established the Ad Hoc Open-Ended Informal Working Group on issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction to, *inter alia*, "[i]ndicate, where appropriate, possible options and approaches to promote international cooperation and coordination for the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction."[789] Recently, its work focused on marine genetic resources.

(2) Food and Agricultural Organization (FAO)

The FAO is the "main forum for developing rules on high seas fisheries".[790] It is a specialised agency of the UN leading international efforts to defeat hunger.

The FAO Fisheries and Aquaculture Department promotes policies and strategies aimed at sustainable and responsible development of fisheries and aquaculture. To that end, the Department provides discussion fora, information, legal and policy frameworks, codes and guidelines, scientific advice, etc.[791]

The Committee on Fisheries (COFI) is a subsidiary body of the FAO Council, which was set up by the FAO Conference at its 13th Session in 1965. It is the principal body responsible for FAO fisheries policy.[792] Its two main functions are the review of the programmes of work of FAO in the field of fisheries and aquaculture and their implementation, and the undertaking of periodic general reviews of international fishery and aquaculture problems.[793]

[787] *Ibid.*, para. 12.

[788] UN General Assembly, Results of the review by the Commission on Sustainable Development of the sectoral theme of "Oceans and seas": international coordination and cooperation, UN Doc. A/RES/54/33, 24 November 1999.

[789] UN General Assembly, Oceans and the Law of the Sea, UN Doc. A/RES/59/24, 17 November 2004, para. 73(d).

[790] Treves, *supra* note 525.

[791] See homepage of the FAO, FAO Fisheries and Aquaculture Department (FI), Mission, available at: http://www.fao.org/fishery/about/organigram/en, last visited 30 March 2012.

[792] Jürgen Friedrich, "Legal Challenges of Nonbinding Instruments: The Case of the FAO Code of Conduct for Responsible Fisheries," *German Law Journal* 9, 1539–1564 (2008), at 1542.

[793] Information retrieved from COFI's website, available at: http://www.fao.org/fishery/about/cofi/en, last visited 27 March 2012.

Article 61(5) FSA provides that the standards for sustainable fisheries developed by the FAO have to be taken into account by the State Parties.

bb) Regional Bodies Concerning High Seas Fisheries in the Arctic

As pointed out, the FSA accords RFMOs an essential role in managing fish stocks covered by the Agreement.[794] Under the Agreement, coastal states and states fishing on the high seas shall seek cooperation to ensure the effective conservation and management of straddling and highly migratory fish stocks.[795] Where the relevant stocks are threatened, or a new fishery is being developed, states have to enter into consultations in good faith and without delay.[796] RFMOs are the key mechanisms to provide for cooperation: Where such an organisation exists, states fishing for the stocks covered by the RFMO shall accede to it.[797] Where there is no RFMO, states are obligated to create one.[798]

By ascribing such a vital role to RFMOs, the FSA "relies heavily upon the effectiveness of these bodies".[799] However, the high seas are not completely covered by competent RFMOs in geographical and functional terms.[800] Many RFMOs have not yet been upgraded and improved to comply with the FSA provisions. Many remain solely focused on the management of targeted fish stocks and do not address effects on linked species and ecosystems.[801] In fact, recently, RFMOs have moved into the focus of concern regarding the shortcomings in conservation and management of high seas fish stocks. Established predominantly for exploitation, these bodies have been slow in adapting to the ecosystem-based approach laid down in the FSA.[802]

The RFMOs and other relevant bodies concerning fisheries in the Arctic can be grouped into two categories: Those bodies whose spatial scope explicitly includes the Arctic and those which apply only implicitly to the region.[803] The latter classification includes the International Commission on the Conservation of Atlantic Tunas (ICCAT) and the Western and Central Pacific Ocean Fisheries Commission (WCPFC).

[794] See Erik Jaap Molenaar, "Participation, allocation and unregulated fishing: The practice of regional fisheries management organisations," *International Journal of Marine and Coastal Law* 18, no. 4 (2003) 457–480, at 458.

[795] Article 8(1) FSA.

[796] Article 8(2) FSA.

[797] Article 8(3) FSA.

[798] Article 8(5) FSA.

[799] Kaye, *supra* note 649, p. 255.

[800] Lodge and Nandan, *supra* note 677, at 356.

[801] Kristina M. Gjerde, "Editor's Introduction: Moving from Words to Action," *International Journal of Marine and Coastal Law* 20, 3/4 (2005), 323–344, at 330.

[802] See Freestone, *supra* note 642, para. 40.

[803] See Molenaar and Corell, *supra* note 102, p. 18.

(1) Bodies with Implicit Competence Over Parts of the Marine Arctic

(a) International Commission on the Conservation of Atlantic Tunas (ICCAT)

The international Commission on the Conservation of Atlantic Tunas (ICCAT) is responsible for the conservation of tunas and tuna-like species[804] in the Atlantic Ocean and adjacent seas.[805] It was established by the Convention for the Conservation of Atlantic Tunas (IConCAT),[806] which was adopted by a Conference of Plenipotentiaries in 1966.[807] Currently, there are 48 Member States, including coastal States like the United States and long-distance fishing nations such as Japan or Korea.[808] All Arctic States are bound by IConCat—either as Contracting Parties[809] or via the European Union.[810]

Whether the convention area includes the marine Arctic, however, remains doubtful. The lack of an agreed northern limit to the Atlantic Ocean could imply the inclusion of Arctic waters into the spatial competence of ICCAT.[811] Yet, the world map section used by ICCAT to illustrate the extent of the Convention area indicates that the northern limit of the Convention area is seen as 70°N.[812]

The distribution of tuna and tuna-like species is likely to be refined presently and in the near future to include the most southern part of the Arctic marine area, with an eventual distribution into the Arctic Ocean probably even further ahead in the future.[813] As soon as this development emerges, ICCAT will have to deal with the management and conservation of the stocks concerned to avoid unsustainable exploitation.

This is a reason for concern: ICCAT is widely considered to have failed to accomplish its goals.[814] A recent high-level review found that

[804] ICCAT is directly concerned with roughly 30 species, for a list see ICCAT homepage, Introduction, available at: http://www.iccat.int/en/introduction.htm, last visited 30 March 2012.

[805] Article I International Convention for the Conservation of Atlantic Tunas signed 14 May 1966, entered into force 21 March 1969, 673 UNTS 63.

[806] Article III (1) IConCAT.

[807] Conference of Plenipotentiaries on the conservation of Atlantic Tunas, Rio de Janeiro, Brazil, May 2 to 14, 1966, available at: http://www.iccat.int/Documents/Commission/BasicTexts.pdf, last visited 22 September 2009.

[808] See ICCAT's homepage http://www.iccat.int/en/contracting.htm, last visited 15 March 2011.

[809] Canada, Russia, the United States, Norway and Iceland.

[810] Finland, Sweden and Denmark.

[811] Molenaar /Corell, *supra* note 102, p. 18 *et seq*.

[812] See http://www.iccat.int/en/convarea.htm, last visited 14 March 2011. The IHO also considers the Atlantic Ocean as being limited to the North by the southern limits of Davis Strait and the southwestern limit of the Greenland and Norwegian Sea, see International Hydrographic Organization, *supra* note, no. 23 – North Atlantic Ocean.

[813] Molenaar/Corell, *supra* note 102, p. 18 *et seq*.

[814] Reflected by the nickname those disappointed by ICCAT's conservation efforts have given it: "The International Conspiracy to Catch All Tuna", see Anjali Nayar, "Bad news for tuna is bad news for CITES," *Nature* (2010), 1–11.

> [f]undamentally ICCAT's performance to date does not meet its objectives for several of the species under its purview [. . .] due in large part to the lack of compliance by many of its [Members, i.e. Contracting Parties, Cooperating non-Contracting Parties, Entities and Fishing Entities (CPCs)].[815]

Conservation failure becomes especially apparent with regard to Bluefin Tuna—the most valuable of the fish species managed by ICCAT:

"ICCAT CPCs' performance in managing fisheries on bluefin tuna [. . .] is widely regarded as an international disgrace and the international community which has entrusted the management of this iconic species to ICCAT deserve better performance from ICCAT than it has received to date."[816]

Biomass level of this fish species have declined to levels so low that it had been proposed—albeit unsuccessfully—for its listing as endangered species under CITES.[817]

ICCAT's lack of success can partially be explained with the fact that the management and conservation regime established under IConCAT is so weak: ICCAT only has the competence to study tuna and tuna-like fish species[818] and issue recommendations aimed at securing stocks at a level that permit maximum sustainable yield.[819] However, the Commission has constantly set catch levels exceeding those recommended by the Sub-Committee on Research and Statistics (SCRS).[820] In addition, the Commission's recommendations become only effective upon a Member State if it does not object.[821] The lack of sanctions for objection means a Member State merely has to express non-acceptance of a recommendation and it does not become binding.[822] Furthermore, the recommendations issued by ICCAT are often based on false catch data provided by the Member States and quota are accordingly set too high.[823]

Sustainable management is furthermore endangered by fishing activities of fishermen from Non-Member States not complying with ICCAT's recommendations (so-called free-riders). To counteract these IUU fishing activities, ICCAT

[815] International Commission for the Conservation of Atlantic Tunas, Report of the Independent Performance Review of ICCAT, Madrid 2009, p. 1.

[816] *Ibid.*

[817] Principality of Monaco, Proposal to include Atlantic Bluefin Tuna (Thunnus thynnus (Linnaeus, 1758)) on Appendix I of CITES in accordance with Article II 1 of the Convention, October 2009, available at: http://www.publicintegrity.org/assets/pdf/CitesProposal.pdf, last visited 7 September 2011.

[818] Article IV(1) IConCAT.

[819] Article VIII(1)(a) IConCAT.

[820] D.G Webster, "The irony and the exclusivity of Atlantic bluefin tuna management," *Marine Policy* 35, no. 2 (2011) 249–251, at 249.

[821] Article VIII(3)(c) IConCAT.

[822] See Elizabeth DeLone, "Improving the Management of the Atlantic Tuna: the Duty to Strengthen the ICCAT in the Light of the 1995 Fish Stocks Convention," *New York University Environmental Law Journal* 6 (1997–1998), 656–673, at 662.

[823] International Commission for the Conservation of Atlantic Tunas, *supra* note, p. 2.

inter alia passed a resolution on an "Action Plan to Ensure Effectiveness of the Conservation Program for Atlantic Bluefin Tuna"[824] in 1994. This program authorises ICCAT to recommend Member States "take non-discriminatory trade restrictive measures" against Non-Member States whose nationals fish for Atlantic bluefin tuna in a way that diminishes the effectiveness of ICCAT's relevant conservation recommendations.[825] However, despite this and other measures to combat IUU fishing as well as efforts to improve conservation measures and enforcement recently undertaken by ICCAT,[826] many fish stocks concerned remain well below MSY.

Therefore, the prospect of ICCAT becoming responsible for conservation and management of fish stocks that have migrated north into Arctic waters raises concerns that their precarious state may be aggravated in the future. The unsuccessful performance of ICCAT in achieving sound conservation of the managed stocks and the particular Arctic circumstances make unsustainable exploitation likely.

(b) Western and Central Pacific Ocean Fisheries Commission (WCPFC)

Tuna and other highly migratory fish species in the Western and Central Pacific Ocean are managed under the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention)[827] and its Commission.[828] As the name indicates, the Convention was designed to apply to the fish stocks in the Western and Central Pacific Ocean. This could mean that Arctic waters are excluded from its area of application. However, according to Article 3 WCPF Convention, the Commission's area of competence comprises all waters of the Pacific Ocean, limited only with regard to its extension to the south and to the east according to the details set out in Article 3(1) WCPF Convention. Thus, the northerly prolongation is not restricted at all, which means

[824] Resolution by ICCAT Concerning an Action Plan to Ensure Effectiveness of the Conservation Program for Atlantic Bluefin Tuna, entered into force: 2 October 1995.

[825] *Ibid.*

[826] See Evelyne Meltzer, "The Quest for Sustainable International Fisheries, Regional Efforts to Implement the 1995 United Nations Fish Stocks Agreement: An Overview for the May 2006 Review Conference," (2009), p. 59.

[827] Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC Convention), Honolulu, 5 September 2000. In force 19 June 2004, 40 ILM 277; sauries are exempted from the application of the Convention, article 3(3).

[828] The WCPFC has 25 Members (Australia, China, Canada, Cook Islands, European Union, Federated States of Micronesia, Fiji, France, Japan, Kiribati, Korea, Republic of Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Chinese Taipei, Tonga, Tuvalu, United States of America, Vanuatu). Furthermore, there are nine Cooperating Non-member(s) (Belize, Ecuador, El Salvador, Indonesia, Mexico, Senegal, Vietnam, Panama, Thailand) and eight Participating Territories (American Samoa, Commonwealth of the Northern Mariana Islands, French Polynesia, Guam, New Caledonia, Tokelau, Wallis and Futuna).

that Arctic waters are theoretically also included. However, as is the case for IConCAT, the Convention area map of the WCPF Convention indicates that the northern boundary is seen at approximately 55°N, thus including parts of Arctic waters. According to the WCPFC, "the northern boundary [of the Convention area] extends to Alaska and the Bering Sea".

The WCPFC came into force in 2004 and is the first RFMO for the management of highly migratory fish stocks that was established after the adoption of the FSA.[829] It completed the global coverage of tuna-like species with RFMOs. The WCPFC covers all highly migratory species (except sauries) in the convention area. Conservation and management measures under this Convention shall be applied throughout the range of the stocks, or to specific areas within the Convention Area.[830] As one of the more recent RFMOs, the WCPFC takes into account the modern conservation principles such as the precautionary approach,[831] ecosystem considerations,[832] minimising discards and bycatch,[833] protection of marine biodiversity[834] and reducing excess fishing capacity and fishing effort.[835]

With regard to its decision making procedure, the WCPFC has found innovative solutions to problems common to many RFMOs. For example, the process of using consensus or unanimous voting when adopting formal decisions found in many RFMOs, while bearing the advantage of having all states as supporters of the adopted decision, also risks agreeing on the "lowest common denominator" and the disadvantage of a lengthy decision-making progress.[836] The WCPFC Convention addresses this problem by prescribing a detailed voting procedure. Generally, decisions shall be made by consensus.[837] However, if no consensus can be reached, decisions shall be made by a qualified three-fourths majority.[838] That being said,

[829] Michael W. Lodge, "The Practice of Fishing Entities in Regional Fisheries Management Organizations: The Case of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean," *Ocean Development & International Law* 37 (2006), 185–207, at 186.

[830] Article 3(3) WCPFC Convention.

[831] Articles 5(c), 6 WCPFC Convention.

[832] Article 5(d) WCPFC Convention.

[833] Article 5(e) WCPFC Convention.

[834] Article 5(f) WCPFC Convention.

[835] Article 5(g) WCPFC Convention.

[836] Ted L. McDorman, "Implementing Existing Tools: Turning Words Into Actions - Decision-Making Processes of Regional Fisheries Management Organisations (RFMOs)," *International Journal of Marine and Coastal Law* 20 (2005) 423–457, at 429.

[837] Article 20(1) WCPFC Convention.

[838] The three-fourth majority has to include three-fourths of members of the South Pacific Forum Fisheries Agency (SPFFA) and three-fourths of the non-members of the SPFFA, article 20 (2) WCPFC Convention; the SPFFA is a regional fisheries agency that was established by Pacific Island states in 1979, see Jon van Dyke and Susan Haftel, "Tuna Management in the Pacific: An Analysis of the South Pacific Forum Fisheries Agency," *University of Hawaii Law Review* 3 (1981), 1–65, at 4. Its main function today is to coordinate the participation of Pacific island

allocation decisions do require consensus. To assist in reaching consensus, the Commission may appoint a conciliator.[839]

The WCPF Convention does not provide a procedure for objection. However, a member that has voted against a decision or was absent at the time of a vote, may seek a review of the decision on the grounds that the decision was inconsistent with the WCPF Convention, the FSA or UNCLOS or that the decision "unjustifiable discriminates" against the member.[840] If the panel reviewing the decision finds that it needs to be modified, the decision has to be revoked or modified at the next meeting of the commission. If the outcome of the review is that a decision discriminates unjustifiably against a member, that decision may be modified so as to not apply to the member affected, effectively creating an opt-out after an objection.[841] However, this result is only available in narrowly defined cases.

Despite the modern principles laid down in the WCPF Convention, conservation efforts in the Convention area seem not to be as successful as could possibly be expected.[842] Recent scientific advice provided to the WCPFC implies the need to reduce fishing mortality for yellowfin and bigeye, which exceed the reference point based on maximum sustainable yield.[843]

There is tension at two levels that fundamentally prevents effective management measures for these two species: Firstly, tension between states mainly engaged in the longline fishery and those principally involved in the purse-seine fishery. While skipjack tuna, one of the main species targeted by purse-seine fisheries, could sustain increases in catches, this increase at the same time would elevate harvests of vulnerable yellowfin and juvenile bigeye that are caught as target and/or bycatch species.[844] Thus, longline fishing nations argue that an increase in purse-seine fishing is threatening sustainability of the yellowfin and bigeye stocks. Purse-

states in the WCPFC, see Adam Langley et al., "Slow steps towards management of the world's largest tuna fishery," *Marine Policy* 33, no. 2 (2009), 271–279, at 272.

[839] Article 20(4) WCPFC Convention.

[840] Article 20 (6)-(9) WCPFC.

[841] McDorman, *supra* note 836.

[842] A recent study on the effectiveness of RFMOs showed that while the WCPFC is theoretically very effective, i.e. meeting modern conservation standards to a large extent, it is not as successful in practice according to the state of stocks managed by WCPFC, see Sarika Cullis-Suzuki and Daniel Pauly, "Failing the high seas: A global evaluation of regional fisheries management organizations," *Marine Policy* 34, no. 5 (2010), at 1039 *et seq*.; as Phillip M. Saunders emphasises that the WCPFC has to manage and conserve fish stocks in a region with numerous small island states, with some of them relying heavily on fish resources and therefore has to deal with special political and geographical features, see *id*., "The Western and Central Pacific Fisheries Commission: Management Challenges and Development Imperatives," in *Recasting transboundary fisheries management arrangements in light of sustainability principles*: *Canadian and international perspectives*, *supra* note 726, 149–74, Legal aspects of sustainable development (Leiden: Martinus Nijhoff, 2010), at 150.

[843] See Langley et al., *supra* note 838, at 277; Hannah Parris, "Is the Western and Central Pacific Fisheries Commission meeting its conservation and management objectives?" *Ocean & Coastal Management* 53, no. 1 (2010), 10–26, at 11.

[844] *Ibid.*

seine fishing nations, in contrast, hold that an expansion of their fishery is hampered by the high level of fishing mortality on yellowfin and bigeye, mainly due to longline fishing.

Secondly, there are tensions between developing coastal states wanting to develop their fleets and allow new entrants to the fishery, and existing distant-water fishing states that want to maintain their present share in the fishery.[845] These conflicting demands continue to hamper efficient conservation measures particularly for yellowfin and bigeye tuna.

(2) Bodies with Explicit Competence Over Parts of the Atlantic Wedge of the Arctic

Like the bodies with implicit competence over Arctic high seas fish stocks, bodies with explicit competence either regulate fish stocks in the Pacific part or in the Atlantic wedge of the Arctic.

(a) International Council for the Exploration of the Sea (ICES)

The International Council for the Exploration of the Sea (ICES) promotes and encourages research and investigation for the study of the Atlantic Ocean and its adjacent seas, primarily of the North Atlantic and its living resources in particular. It draws up programmes required for this purpose, organises the necessary research and investigations and publishes their results.[846] The ICES is not a management, but a scientific body that provides advice to regulatory commissions, *inter alia* to NEAFC and NASCO.

The ICES is an international organisation, which was founded in 1902 at Copenhagen and consists of 20 Member States.[847] Every member country elects two delegates who represent their country on the ICES Council, which is the principal policy and decision-making body of ICES. There are also a number of countries that have affiliate status with ICES[848] and non-governmental organisations with formal observer status.

One of the ICES' main tasks is to monitor the abundance of the fish stocks in the North-East Atlantic.[849] The foundation of the ICES scientific programme is made

[845] Langley *et al*., *supra* note 838, at 277, 279.

[846] Articles 1 and 2, Convention for the International Council for the Exploration of the Sea (ICES), 12 September 1964, Preamble, available at: http://www.ices.dk/aboutus/convention.asp, last visited 17 August 2010.

[847] Preamble, Convention for the International Council for the Exploration of the Sea (ICES), 12 September 1964, available at: http://www.ices.dk/aboutus/convention.asp, last visited 17 August 2010. The Member States are Belgium, Canada, Denmark (including Greenland and Faroe Islands), Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, the United Kingdom, and the United States of America, see ICES Homepage, available at: http://www.ices.dk/aboutus/ourmembers.asp, last visited 17 August 2010.

[848] Australia, Chile, Greece, Peru, and South Africa.

[849] Hans Tambs-Lyche, "Monitoring fish stocks: The role of ICES in the North-East Atlantic," *Marine Policy* (1978) 127–132, at 127.

up of the Working/Study Groups that cover all aspects of the marine ecosystem from oceanography to seabirds and marine mammals.[850] The Arctic Fisheries Working Group for example, provides advice to the Joint Norwegian-Russian Fisheries Commission.

(b) Northwest Atlantic Fisheries Organization (NAFO)

The Northwest Atlantic Fisheries Organization (NAFO) was founded in 1979 by the "Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries" (NAFO Convention).[851] It has 12 Members from North America, Europe, Asia and the Caribbean.[852] Of Arctic states, Canada, Iceland, Norway, Denmark (in respect of the Faroe Islands and Greenland), the Russian Federation and the USA are Members. In addition, the European Union is a Member to the NAFO Convention, with the effect that Finland and Sweden are also bound by it.

The NAFO Convention Area encompasses a large portion of the northwest Atlantic, including the 200-mile zones of the four coastal states of Canada, Denmark (Greenland), France (St. Pierre et Miquelon) and the USA.[853] The regulatory area, however, is limited to the part of the Convention Area that is beyond coastal states' national jurisdiction. NAFO manages all fishery resources of the Convention Area,[854] except for marine mammals, highly migratory species[855] and sedentary species.[856] They include 19 stocks comprising 11 species.[857]

[850] Information retrieved from ICES' website, available at: http://www.ices.dk/products/introduction.asp, last visited 18 August 2010.

[851] Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries, Ottawa, 24 October 1978. In force 1 January 1979, 1135 UNTS 369; available at: www.nafo.int; 2007 Amendment, Lisbon, 28 September 2007. Not in force, NAFO/GC Doc. 07/4. The 2007 Amendment consists of eight articles which replace the title with "Convention on Cooperation in the Northwest Atlantic Fisheries" and the existing Preamble, Annexes and almost all provisions by new ones.

[852] Canada, Cuba, Denmark (in respect of Faroe Islands and Greenland), the European Union, France (in respect of Saint Pierre et Miquelon), Iceland, Japan, the Republic of Korea, Norway, the Russian Federation, Ukraine and the United States of America.

[853] The Convention Area encompasses "the waters of the Northwest Atlantic Ocean north of 35º00' north latitude and west of a line extending due north from 35º00' north latitude and 42º00' west longitude to 59º00' north latitude, thence due west to 44º00' west longitude, and thence due north to the coast of Greenland, and the waters of the Gulf of St. Lawrence, Davis Strait and Baffin Bay south of 78º10' north latitude".

[854] This consists of the Atlantic Ocean with the limits set out in Article I(1) NAFO Convention.

[855] Highly migratory fish species are regulated through ICCAT or NASCO.

[856] Article I(4) NAFO Convention. See Henriksen, Hønneland and Sydnes, *supra* note 663, p. 63. Sedentary species are subject to the sovereign rights of the coastal state, article 77(4) UNCLOS.

[857] Cod, Redfish (three species), American plaice, Witch flounder, Yellowtail flounder, Greenland halibut, White hake, Skate, Capelin, Squid, Shrimps, see http://www.nafo.int/fisheries/frames/fishery.html, last visited 9 September 2011.

The main fishing gear used in the regulatory area is the bottom trawl, with a catch in the Northwest Atlantic amounting to slightly over 60 % of the overall high seas bottom trawl catch worldwide.[858]

For the first 15 years of its existence, NAFO unsuccessfully struggled with overfishing and stock depletion in the Convention Area. TACs set by coastal states (for EEZs) and by NAFO (for the Regulatory Area) were too high to be sustainable due both to poor scientific advice and to international and national managers' disregard of this advice. A relatively ineffective management system combined with a lack of compliance and enforcement agreed management measures by Contracting Parties aggravated the situation.[859]

A major weakness of the 1978 NAFO Convention is its provision for opting out of proposals made by NAFO's Fisheries Commission. Most objections have been raised with regard to proposals allocating TACs or fishing activity: 44 of the 47 objections raised between 1994 and 2004 concerned the allocation of fishing rights. The European Union as the largest actor in the Regulatory Area has frequently made use of the objection procedure, setting its own quotas exceeding the TAC set by NAFO. The EU's objection to the allocation set for Greenland Halibut—or turbot as it is called locally—and the subsequent unilateral quota establishment in 1995 started what later became known as the 'Turbot War'.[860] The dispute was eventually resolved by the 1995 Canada–European Union Agreed Minute on the Conservation and Management of Fish Stocks, which led to the adoption of enhanced control and enforcement measures within NAFO. The objection procedure, however, was retained and been used frequently over the last two decades.

By the early 1990s, the state of the fisheries resources in the NAFO Convention Area reached critical levels. The large northern cod stock that had until then by far been the most important fish stock in the area, collapsed in 1992 and was placed under a moratorium first within the Canadian EEZ and subsequently in the NAFO Regulatory Area. By 1994, the ground fish stocks had collapsed and moratoria or severe restrictions had been placed on all the important straddling stock fisheries in the NAFO Regulatory Area, but these were not respected by all Contracting Parties.[861]

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[858] Matthew Gianni, High Seas Bottom Trawl Fisheries and their Impacts on the Biodiversity of Vulnerable Deep-Sea Ecosystems: Options for International Action, IUCN, Gland, Switzerland 2004, p. 49.

[859] Douglas Day, "Addressing the weakness of high seas fisheries management in the North-west Atlantic," *Ocean Development & International Law* 35, 2–3 (1997), 69–84, pp. 75 *et seqq*.; *id*., "Tending the achilles' heel of NAFO: Canada acts to protect the nose and tail of the Grand Banks," *Marine Policy* 19, no. 4 (1995), 257–270, at 261 *et seq*.

[860] Christopher C. Joyner and Alejandro A. von Gustedt, "The Turbot War of 1995: Lessons for the Law of the Sea," *International Journal of Marine and Coastal Law* 11, no. 4 (1996), 425–458, at 439.

[861] Anthony Cox, Leonie Renwrantz and Ingrid Kelling, *Strengthening regional fisheries management organisations* (Paris: OECD, 2009), p. 93 *et seq*.

Despite improvements in monitoring, control and surveillance and measures to fight IUU fishing as well as a continuous reduction of TACs, many of the stocks in the NAFO Convention Area had still not recovered in 2008, and 10 of the 20 stocks under NAFO management had been under moratoria for a number of years.[862]

In 2005, a review of the NAFO Convention was launched, with a view to reforming decision-making processes, incorporating more integrated ocean management approaches, and examining the current structure of NAFO. The reform process culminated in the adoption of the "Amendment to the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries" on 28 September 2007.[863] The reformed Convention text now has to be ratified by at least three-fourths of the NAFO Contracting Parties (CPs) to become legally binding according to Article XXI NAFO Convention. To date, only Norway and Canada have approved the amended Convention.[864]

The 2007 NAFO Amendments represent a complete overhaul of the NAFO Convention. The old Convention has been revised to reflect modern conservation principles to ensure "long-term sustainability of fishery resources".[865] Contracting Parties shall apply the precautionary approach,[866] take due account of the impact of fishing activities on other species and marine ecosystems[867] and the need to preserve marine biological diversity.[868] The Amendments address cooperation with non-contracting parties and with other organisations, including other RFMOs.[869] Importantly, they also amend the general decision-making procedure: Consensus is established as the general rule for decision-making. Where consensus cannot be reached, a two-thirds majority of the votes suffices. The 1978 NAFO Convention, in contrast, generally required only a simple majority.[870] Finally, the NAFO Amendments introduce a new dispute settlement mechanism.[871]

If and when the NAFO Amendments enter into force, they will represent a major breakthrough, stream-lining NAFO and aligning it with contemporary international fisheries law. The effectiveness of the reform in ensuring sustainable fisheries in the

[862] Northwest Atlantic Fisheries Organization Conservation and Enforcement Measures, NAFO/FC Doc. 08/1, 2008, Annex I.A.

[863] Amendment to the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries (NAFO Amendments), GC Doc. 07/4, 28 September 2007, available at: http://www.nafo.int/about/frames/about.html, last visited 9 September 2011.

[864] Canada, Department of Fisheries and Oceans, "Canada Ratifies Amended Convention of the Northwest Atlantic Fisheries Organization", news release, 11 December 2009, available at: http://www.worldfishing.net/news101/canada-ratifies-amended-convention-of-the-northwest-atlantic-fisheries-organization, last visited 9 September 2011.

[865] Article III(a) NAFO Amendments, *supra* note 863.

[866] Article III(c) NAFO Amendments, *ibid.*

[867] Article III(d) NAFO Amendments, *ibid.*

[868] Article III(e) NAFO Amendments, *ibid.*

[869] See articles XVI and XVII NAFO Amendments, *ibid.*

[870] Article V(2) 1978 NAFO Convention, *ibid.*

[871] Article XV NAFO Amendments, *ibid.*

Convention area, however, remains to be seen. Multiple challenges still remain such as rebuilding moratoria stocks, reducing and mitigating bycatch of stocks under moratoria, and improving Contracting Parties' compliance.

(c) North Atlantic Salmon Conservation Organization (NASCO)

The North Atlantic Salmon Conservation Organization (NASCO) is an international organisation set up by an inter-governmental Convention in 1984[872] "to conserve, restore, enhance and rationally manage Atlantic salmon through international cooperation taking account of the best available scientific information".[873] The Convention is applicable to the salmon stocks that migrate beyond areas of fisheries jurisdiction of coastal States of the Atlantic Ocean north of 36°N latitude as part of their migratory range.[874]

NASCO has six Parties: Canada, Denmark (in respect of the Faroe Islands and Greenland), the EU, Norway, the Russian Federation and the US. Due to financial considerations, Iceland withdrew from NASCO with effect from 31 December 2009. NASCO also has 35 accredited NGOs.[875]

The NASCO Convention created a large protected zone, free of targeted fisheries for Atlantic salmon in most areas beyond 12 nm from the coast, excepting areas off the west coast of Greenland and waters under the fisheries jurisdiction of the Faroe Islands.[876]

NASCO's main role is that of a consultation forum in which its parties share information. It also has a limited function in developing regulatory measures for fisheries in the areas where fishing is not banned.[877]

In the late 1980s and early 1990s, NASCO also acted through diplomatic initiatives to address fishing for salmon in international waters by non-party vessels. Although a Protocol, by which signatory states would agree to implement fisheries management provisions of the NASCO Convention, was not adopted by any state,

[872] Convention for the Conservation of Salmon in the North Atlantic Ocean (NASCO Convention), 2 March 1982, in force 1 October 1983, 1338 UNTS 33.

[873] Article 3(2) NASCO Convention.

[874] Article 1 NASCO Convention.

[875] Information obtained from NASCO's website, available at: http://www.nasco.int/background.html, last visited 28 September 2009.

[876] More precisely, according to article 2 NASCO Convention, fishing of salmon is prohibited beyond areas of fisheries jurisdiction of coastal States. Within areas of fisheries jurisdiction of coastal States, fishing of salmon is prohibited beyond 12 nm from the baselines from which the breadth of the territorial sea is measured, except in the West Greenland Commission area, up to 40 nautical miles from the baselines and in the North East Atlantic Commission area, within the area of fisheries jurisdiction of the Faroe Islands.

[877] See David L. VanderZwaag and Emily J. Pudden, "The North Atlantic Salmon Conservation Organization (NASCO): Surpassing a 25 Year Voyage in Transboundary Cooperation but Still Confronting a Sea of Challenges," in *Recasting transboundary fisheries management arrangements in light of sustainability principles*: *Canadian and international perspectives*, *supra* note 726, 307–46, at 311.

the diplomatic measures seem to have had some success: Since February 1994 no non-Contracting Parties have been sighted fishing for salmon.[878]

Initially, NASCO focused mainly on developing management measures for the distant-water fisheries around West Greenland and the Faroe Islands. Yet, although commercial fishing for salmon in the North-Atlantic high seas has widely ceased, salmon stocks have still declined.[879] Thus, NASCO has considerably broadened its base and now addresses a wide range of issues including management of salmon fisheries by States of Origin, habitat protection and restoration and aquaculture and related activities.[880]

Furthermore, although the FSA does not apply to Atlantic salmon since it is an anadromous fish, the NASCO has "taken actions consistent with some of the provisions of the FSA."[881] For example, NASCO has adopted various instruments to apply the precautionary approach to the conservation, management and exploitation of salmon, *inter alia* the Agreement on Adoption of a Precautionary Approach of 1998 and the accompanying Action Plan for Application of the Precautionary Approach of 1999. However, implementing precaution in management decisions, especially when setting catch limits but also with regard to aquaculture and habitat conservation, continues to be a major challenge for NAFO.[882] Also, the ecosystem-based approach is not sufficiently implemented, e.g. as regards habitat protection.[883] Although it has to be recognised that NASCO undertook and continues to undertake considerable efforts to strengthen its framework and performance, its effectiveness in terms of conservation of Atlantic salmon still leaves much to be desired.[884]

(d) North East Atlantic Fisheries Commission (NEAFC)

The North East Atlantic Fisheries Commission (NEAFC) in its current form was established through the 1980 Convention on future Multilateral Co-operation in North-East Atlantic Fisheries, which entered into force in 1982.[885] This Convention

[878] National Marine Fisheries Service (NMFS), Convention for the Conservation of Salmon in the North Atlantic Ocean (Basic Instrument for the North Atlantic Salmon Conservation Organization), Washington 2005, p. 5, available at: www.nmfs.noaa.gov, last visited 29 September 2011.

[879] NASCO, Twenty-Year Milestones and Next Steps – A Vision for the Future, Edinburgh 2004, p. 5 *et seq*.

[880] See *ibid*., pp. 8 *et seqq*.

[881] Gail L. Lugten, The role of international fishery organizations and other bodies in the conservation and management of living aquatic resources (Rome: FAO, 2010), p. 46.

[882] VanderZwaag and Pudden, *supra* note 877, at 334 *et seq*.

[883] NASCO Council, Report of the 'Next Steps' for NASCO Review Group, Edinburgh, 7 April 2011, p. 10.

[884] See Cullis-Suzuki and Pauly, *supra* note 842, at 1040.

[885] Convention on Future Multilateral Cooperation in the North-East Atlantic Fisheries (1982 NEAFC Convention), London, signed 18 November 1980, in force 17 March 1982, 1285 UNTS 129; available at: www.neafc.org; 2004 Amendments (Article 18bis), London; 12 November

replaced the original North East Atlantic Fisheries Convention of 1959,[886] which had supplanted the 1946 Convention for the Regulation of Meshes and Fishing Nets and the Size Limits of Fish.[887] Before 1995, the NEAFC acted chiefly as a forum for consultation in fisheries management issues rather than as a body for adopting conservation and management measures.[888] However, since then NEAFC has undergone a series of policy changes that led to the adoption of a new Convention in 2006.[889]

The NEAFC Contracting Parties are Denmark (the Faeroe Islands and Greenland), the EU, Iceland, Norway and the Russian Federation.[890] The Convention Area covers waters within those parts of the Atlantic and Arctic Oceans and their dependent seas that lie north of 36°N and between 42°W and 51°E, within that part of the Atlantic Ocean north of 59°N and between 44°W and 42°W, but excludes the Baltic and Mediterranean Seas.[891] Most of this area is under the fisheries jurisdiction of NEAFC's Contracting Parties, as it is defined as national waters, but three large areas are international waters and constitute the NEAFC Regulatory Area: the Reykjanes—Ridge-Azores, the 'Doughnut Hole' (or 'Banana Hole') of the Norwegian Sea and the 'Loophole' in the Barents Sea.

2004. Not in force, but provisionally applied by means of the "London Declaration" of 18 November 2005; available at www.neafc.org; 2006 Amendments, London (Preamble, Articles 1, 2 and 4), 11 August 2006. Not in force, but provisionally applied by means of the "London Declaration" of 18 November 2005; available at: www.neafc.org. The provisionally applied Convention is hereinafter referred to as (new) "NEAFC Convention".

[886] North-East Atlantic Fisheries Convention, signed 42 January 1959, entered into force 27 June 1963, 486 UNTS 157.

[887] Convention for the Regulation of the Meshes of Fishing Nets and the Size Limits of Fish, signed 5 April 1946, entered into force 5 April 1953, 231 UNTS 200. The reorganisation of NEAFC resulted from the withdrawal of the EC Members states as individual members from NEAFC in 1963 and the establishment of 200-nm-zones in 1977, Trond Bjørndal, "Overview, roles, and performance of the North East Atlantic fisheries commission (NEAFC)," *Marine Policy* 33, no. 4 (2009), 685–697.

[888] By 1995, only two recommendations had been agreed within NEAFC: a minimum mesh size for capelin in 1984 and a minimum mesh size for blue whiting in 1986, Cox, Renwrantz and Kelling, *Strengthening regional fisheries management organisations*., p. 67.

[889] The new NEAFC Convention has not entered into force yet, but is applied provisionally.

[890] Cooperating Non-Contracting Parties are Belize, Canada, Cook Islands, Japan and New Zealand; information obtained from the NEAFC homepage, available at: www.neafc.org, last visited 9 September 2011.

[891] The NEAFC Convention seems to not apply to the waters north of Greenland between 44° west longitude and 42° west longitude extending to the North Pole. While article 1(a)(1) NEAFC Convention refers to the "Atlantic and Arctic Oceans", the term Arctic is not used in article 1(a)(2) NEAFC Convention, Koivurova and Molenaar, *supra* note 214, p. 15, note 39.

NEAFC covers resources of fish, molluscs, crustaceans and sedentary species,[892] except, as far as they are dealt with by other international agreements, highly migratory species[893] and anadromous stocks.[894]

The NEAFC Commission was formed to recommend measures to maintain the rational exploitation of fish stocks in the Convention areas beyond national fisheries jurisdiction of Contracting Parties,[895] based on scientific advice provided by ICES.[896] On request from Contracting Parties, NEAFC will also recommend measures for areas under their fisheries jurisdiction.[897]

As referred to earlier, starting in 1995, NEAFC took several steps towards enhancement and modernisation. One of the key triggers for these changes was the poor state of fish stocks in the North-East Atlantic that was a result of decades of overfishing, overcapacity of fishing fleets and considerable IUU fishing. In addition, the Contracting Parties ratified the FSA and were willing to fulfil their commitments under that Agreement.[898]

The most important recent developments within the organisation were amendments to the 1982 NEAFC Convention in 2004 and 2006 and the drafting of a new NEAFC Convention.

The 2004 amendment related to a procedure for the settlement of disputes that had previously been lacking. A fast track dispute settlement mechanism was introduced, under which Contracting Parties could refer any dispute concerning interpretation or application of the convention to an ad hoc panel that they were unable to resolve by negotiation, arbitration, judicial settlement or other peaceful means. Furthermore, the objection procedure was amended. The Contracting Parties agreed that the objecting party "shall give a statement of the reasons [. . .] and a declaration of its intentions following the objection or notice, including a description of any alternative conservation and management measures which the Contracting Party intends to take or has already taken".[899] Thus, they raised the

[892] Sedentary species have been included by the new Convention, see article 1b).

[893] Highly migratory species are regulated through ICCAT or NASCO.

[894] The main fish species targeted in the NEAFC Convention Area are Redfish, Mackerel, Haddock, Herring, Blue Whiting as well as deep-sea species. Commercially, the most important species include herring, blue whiting and mackerel, Cox, Renwrantz and Kelling, *Strengthening regional fisheries management organisations*, p. 69. Gjerde observed that NEAFC "[w]ill not cover jellyfish or sea cucumber fisheries that are emerging elsewhere", *id*., "Regulatory and Governance Gaps in the International Regime for the Conservation and Sustainable Use of Marine Biodiversity in Areas Beyond National Jurisdiction." Gland: IUCN, 2008, p. 24.

[895] Article 14 NEAFC Convention.

[896] Article 5 NEAFC Convention.

[897] Article 6(1) NEAFC Convention.

[898] Cox, Renwrantz and Kelling, Strengthening regional fisheries management organisations., p. 74.

[899] NEAFC, Report of the 23rd Annual Meeting of the North-East Atlantic Fisheries Commission 8–12 November 2004, Volume II: Annexes, Annex K – Amendment of the Convention on Dispute Settlement, NEAFC, London, p. 29.

standards a party has to meet to make an objection, but did not completely abandon the procedure.

The amendments of 2006 aimed to modernise the NEAFC Convention and align it with recent developments by including aspects of an ecosystem approach, the protection of biodiversity and the precautionary approach. The result was an almost completely new Convention, as only one article of the text remained unchanged. Pending ratification, the Contracting Parties agreed to apply the new Convention on a provisional basis.

In 2005, NEAFC, as the first RFMO in the world, underwent a review to assess its performance regarding accordance with UNCLOS, FSA and other relevant international instruments.[900] The panel found that the NEAFC policy framework generally implemented the relevant agreements satisfactorily,[901] but that shortcomings existed *inter alia* regarding allocation arrangements in key fisheries (especially concerning redfish).[902]

In fact, allocation remains a difficult issue for NEAFC: Where fish stocks straddle EEZs, allocations are negotiated bilaterally between the states concerned.[903] NEAFC only addresses allocation for discrete high seas fish stocks (deep sea and redfish stocks) as its decision-making role is limited to fisheries in the NEAFC Regulatory Area, waters beyond this are under the jurisdiction of Contracting Parties.[904]

Other major concerns revealed by the review panel have since been addressed successfully. On the issue of IUU fishing, NEAFC established a new "Scheme of Control and Enforcement" that introduced a port control system in 2007. Furthermore, NEAFC has "joined forces"[905] with NAFO to create a pan-North Atlantic list of IUU vessels. The organisations agreed to transfer vessels on their respective lists of IUU vessels from the list of one RFMO to the list of the other.[906]

[900] Lugten, *supra* note 881, p. 49.

[901] NEAFC, Performance Review Panel Report of the North East Atlantic Fisheries Commission, 6 November 2006, available at: http://www.neafc.org/system/files/performance-review-final-edited.pdf, last visited 10 September 2011, p. 55 *et seq*.

[902] *Ibid*., p. 37.

[903] Each coastal states agreement, however, includes a high seas component that is to be allocated to states by NEAFC, see Tore Henriksen and Alf H. Hoel, "Determining Allocation: From Paper to Practice in the Distribution of Fishing Rights Between Countries," *Ocean Development & International Law* 42, 1–2 (2011), 66–93, at 77.

[904] NEAFC, Performance Review Panel Report of the North East Atlantic Fisheries Com-mission, p. 44.

[905] NEAFC, The NEAFC Performance Review Information Update, March 2007, available at: http://www.neafc.org/system/files/neafc_review_final_march07.pdf, last visited 10 September 2011.

[906] *Ibid.*

NEAFC also signed a Memorandum of Understanding with the OSPAR Commission.[907] Additionally, NEAFC has taken area-based management measures, closing several areas to bottom fishing to protect VMEs.[908] Some areas are only closed on a seasonal basis[909] while others are defined as existing bottom fishing areas.[910]

With regard to many initiatives to enhance its underlying framework and performance to comply with modern conservation principles, NEAFC has been a pioneer and a role-model for other RFMOs.[911] However, concerning its effectiveness and ability "to ensure the long-term conservation and optimum utilisation of the fishery resources in the Convention Area"[912] there remains some work to be done.[913]

(3) Bodies with Explicit Competence Over Parts of the Pacific Wedge of the Arctic

(a) North Pacific Anadromous Fish Commission (NPAFC)

The North Pacific Anadromous Fish Commission (NPAFC) was created pursuant to the Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean (NPAFC Convention) in 1992.[914] The Contracting Parties are Canada, Japan, Korea, the Russian Federation, and the United States, making the Convention "the most inclusive agreement pertaining to Pacific salmon".[915] The primary aim is promoting the conservation of anadromous stocks in the Convention Area,

[907] Memorandum of Understanding between the North East Atlantic Fisheries Commission (NEAFC) and the OSPAR Commission, applied from 5 September 2008, available at: http://www.ospar.org/html_documents/ospar/html/mou_neafc_ospar.pdf, last visited 10 September 2011.

[908] NEAFC, Consolidated text of all NEAFC recommendations on regulating bottom fishing, Annex 7, Area closures for the Protection of Vulnerable Marine Ecosystems.

[909] See NEAFC, Recommendation X:2010, Recommendation by the North-East Atlantic Fisheries Commission in accordance with article 5 of the Convention on Future Multilateral Cooperation in North-East Atlantic Fisheries at its annual meeting in November 2009 to adopt regulatory measures for the protection of blue ling in the NEAFC Regulatory Area (ICES Division XIV).

[910] NEAFC, Consolidated text of all NEAFC recommendations on regulating bottom fishing, Annex 6, Existing fishing areas. It is noteworthy that NEAFC has been the first RFMO that closed an area of high seas for bottom fishing, see Ingrid Kvalvik, "The North East Alantic Fisheries Commission and the Implementation of Sustainability Principles: Lessons to be Learned?," in *Recasting transboundary fisheries management arrangements in light of sustainability principles: Canadian and international perspectives*, *supra* note 726, 387–417, at 415.

[911] *Ibid.*

[912] Article 2 NEAFC Convention.

[913] See Cullis-Suzuki and Pauly, *supra* note 842, at 1040.

[914] Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean, signed on February 11, 1992 and entered into force on February 16, 1993, TIAS No. 11465.

[915] Sean Phelan, "A Pacific rim approach to salmon management: Redefining the role of Pacific salmon international consensus," *Environmental law* 33, no. 1 (2003) 247–289, at 263.

which comprises the waters of the North Pacific Ocean and its adjacent seas[916] north of 33°N beyond the 200-miles zones of the coastal States.[917] The anadromous fish covered by the Convention include seven salmon species.[918]

The NPAFC Convention prohibits directed fishing for anadromous fish in the Convention Area, requires the minimisation of incidental taking of anadromous fish and prohibits the retention on board a fishing vessel of anadromous fish taken as an incidental catch during fishing for non-anadromous fish.[919] This regulation is in accordance with Article 66 UNCLOS that transfers the responsibility for anadromous fish stocks to the states of origin while prohibiting the conduct of fishing for these stocks on the high seas.

Pursuant to the Convention, fishing for anadromous fish in the Convention Area is only permitted for scientific research purposes under national and joint research programs approved by the Commission (article VII(6) and (7) NPAFC Convention). Parties are mandated to develop cooperation programs to collect fishing information in the Convention Area for the purpose of scientific research on anadromous stocks and, as appropriate, ecologically related species (article VII (4) NPAFC Convention). Upon request of the Commission, Parties have to provide catch, enhancement and other technical information and materials pertaining to areas adjacent to the Convention Area from which anadromous stocks migrate into the Convention Area (article VII(3) NPAFC Convention).

All Parties must take all measures necessary to ensure its nationals and fishing vessels flying its flag comply with the provisions of the Convention, article V(1). Furthermore, the Convention grants each Party the authority to enforce the Convention's provisions, including the right to board, inspect and detain fishing vessels of the other Parties found operating in violation of the Convention (article V(2)).

Although being applauded for successfully implementing the prohibition on high seas fisheries for salmon,[920] fish stocks under NPAFC's purview are still declining.[921] This shows that measures for anadromous fish stocks that measures for anadromous fish stocks that exclusively tackle high seas fisheries are not sufficient to ensure sustainable management of these species because they spend part of their life cycle in waters under national jurisdiction.

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[916] North of 33°N, Article I NPAFC Convention.

[917] Article I NPAFC Convention.

[918] Chum salmon, Coho salmon, Pink salmon, Sockeye salmon, Chinook salmon, Cherry salmon and Steelhead trout.

[919] Article III(1) NPAFC Convention.

[920] See Rosemary G. Rayfuse, *Non-flag state enforcement in high seas fisheries* (Leiden; Boston: M. Nijhoff, 2004), p. 134; Kevin W. Riddle, "Illegal, unreported, and unregulated fishing: Is international cooperation contagious?" *Ocean development and international law* 37, 3/4 (2006), 265–297, at 280.

[921] See Jennifer Bond and Ted L. McDorman, "Canada's Pacific Fisheries Agreements: Halibut, Hake, Tuna, and Salmon Outside 200," in *Recasting transboundary fisheries management arrangements in light of sustainability principles*: *Canadian and international perspectives*, *supra* note 726, 115–47, at 132.

(b) Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea

The Convention on the Conservation and Management of the Pollock Resources in the Central Bering Sea[922] (CBS Convention) applies to the high seas area of the Bering Sea beyond the EEZ's of the coastal States (Russia and the US).[923] This high seas area is often referred to as the 'Doughnut Hole' because it appears as a hole between the adjacent EEZs.

Parties to the Convention are Japan, China, Korea, Poland, the Russian Federation, and the United States. Other states may only join the Convention if all parties unanimously invite this state to do so (Article XVI(4) CBS Convention). This process for admitting new parties is in contradiction to the FSA that gives all states with a 'real' interest the right to join an existing RFMO (Article 8(3)).[924] However, as *Balton* points out, all states that were engaged in fisheries in the Convention Area became parties and other states could hardly claim a 'real interest' in the sense of the FSA.[925]

The CBS Convention was created to set up an international regime for conservation, management, and optimum utilisation of pollock resources in the Convention Area; to restore and maintain the pollock resources in the Bering Sea at levels permitting their maximum sustainable yield; to cooperate in the gathering and examining of factual information concerning pollock and other living marine resources in the Bering Sea; and to provide a forum in which to consider the establishment of necessary conservation and management measures for living marine resources other than pollock in the Convention Area as may be required in the future (Article II CBS Convention). To date, no other marine living resources have been taken into consideration.[926]

Since the implementation of the CBS Convention in 1992, a moratorium on commercial pollock fishing in the central Bering Sea has been in place. However, the Aleutian Basin pollock biomass has continued to be beneath the prescribed level set up in the Annex to the Convention. This means the fish stocks have not recovered from their critical state even after more than 16 years of moratorium.

The collapse of the pollock stock in the Bering Sea was the result of extensive trawl fishing by vessels from China, Japan, Korea, Poland, and the former Soviet

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[922] Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea, 16 June 1994, in force 8 December 1995.

[923] Article I CBS Convention.

[924] Kaye, *supra* note 649, p. 330.

[925] David A. Balton, "The Bering Sea Doughnut Hole Convention: Regional Solution, Global Implications," in *Governing High Seas Fisheries* (see note 696), 143–78, at 171; likewise *Kaye*, *supra* note 649, p. 331.

[926] Article II makes only a very weak concession to a wider management approach. No reference is made to the inter-relationship of marine species, Stuart B. Kaye, "Legal approaches to Polar fisheries regimes: A comparative analysis of the Convention for the Conservation of Antarctic Marine Living Resources and the Bering Sea Doughnut Hole Convention," *California Western International Law Journal* 26, no. 1 (1995) 75–114, at 102.

Union. Pollock fishing in the 'Doughnut Hole' did not start until both the United States and the Soviet Union extended their fisheries jurisdiction claims to 200 nm from their shores. Gradually, both countries developed considerable fishing fleets that were able to harvest almost the complete total allowable catches of pollock in their respective EEZs. Therefore, the allocations granted to other fishing nations were gradually decreasing, leading these nations to begin exploring the remaining high seas area, and starting a rapidly growing pollock fishery in the 'Doughnut Hole' from the mid-1980s on.[927] It culminated in a record catch of 1.4 million metric tons of pollock harvested in 1989 and became the "largest single-species commercial fishery the world had ever known".[928] Of course, this enormous fishing pressure was not without effect: By 1992, the pollock stock in the Bering Sea had completely collapsed. The governments of the United States and the Soviet Union were very concerned about the impending depletion of the pollock stock and agreed to a voluntary suspension of fishing in the area for 1993 and 1994, since a profitable harvest quantity was no longer achievable.

A serious deficiency of the CBS Convention is related to the application of the precautionary approach and the ecosystem-based approach. Although it could be argued that the CBS Convention adopts an approach that might be termed 'precautionary', it does not provide for 'precautionary reference points' as required by the FSA.[929] The ecosystem-based approach is impossible to realise under the current (and most probably remaining) single-species management regime of the Convention. Since a recommendation pertaining to the conservation and management of other species would depend on a unanimous vote of the parties, this change is highly unlikely to occur.[930]

Another weakness concerns the participation of non-parties to the CBS Convention. Pursuant to Article XII (5), any non-Party may only participate as an observer at the Annual Conferences if the parties unanimously extend an invitation. This condition is hardly consistent with Article 12 FSA, which stipulates that representatives from non-governmental organisations shall be afforded the opportunity to take part in meetings of RFMOs/As as observers or otherwise, and procedures are not supposed to be too restrictive in this respect. The Convention seems to provide only for the option of non-party *states* to participate as observers, but not for NGOs or international organisations.[931]

These deficiencies to the CBS Convention give cause for serious concern should the agreement ever become effective, i.e. if the pollock stock recovers and the biomass exceeds the critical threshold.

In another respect, the CBS Convention is quite innovative: With regard to enforcement of the conservation measures, Article XI not only stipulates the

[927] Balton, *supra* note 925, at 147 *et seq*.

[928] *Ibid*., at 143.

[929] *Ibid*., at 171.

[930] See *ibid*., at 162.

[931] See *Kaye*, *supra* note 926, at 103.

responsibility of the flag state to ensure compliance with the CBS Convention and its ability to board and inspect the vessel. According to paragraph 6 of the Article, all parties consent in advance to the boarding and inspection of fishing vessels flying its flag and located in the Convention Area by duly authorised officials of any other Party for compliance with this Convention or measures adopted pursuant thereto. For cases of what might be called serious violation of the Convention's conservation measures and when the flag-state Party is not in a position to take immediate control of or otherwise carry out its responsibility for the operation of the fishing vessel, the officials of the boarding Party may continue the boarding process until the flag-state takes over responsibility for the operation of the vessel. The Parties concerned shall consult and take such practical steps as may be necessary to ensure compliance. These provisions served as a model to Articles 21 and 22 of the FSA and—in the words of *Balton*—"appear to represent the beginning of a new era in high seas fisheries enforcement".[932]

Actually, the negotiations of both the FAO Compliance Agreement and of the FSA coincided with those for the CBS Convention and the results of the negotiations bear some resemblance. Apart from the rights of non-flag states to board and inspect fishing vessels, the FSA and the CBS Convention also both build on the best available scientific information (Article 5(b) FSA and Record Part B 1(b)) as a basis for the conservation and management measures and the collection and sharing of data in a timely manner (Article 18(3)(e) FSA and Article XI(4)(b) CBS Convention).

Another weakness with regard to the geographic scope of the Convention gives rise to some concern should the pollock stock ever recover: The Convention is limited to the Doughnut Hole, no multilaterally agreed measures apply to the EEZs of the United States and Russia. This might cause some tensions should pollock fishing in the Convention area resume.

Pursuant to the aforementioned General Assembly resolution 61/105, in which the General Assembly requested States and RFMO/As to sustainably manage fisheries, regulate bottom fisheries and protect VMEs, Japan, the Republic of Korea, the Russian Federation and the US started discussions on a new RFMO/A as well as interim measures for the North Pacific. At the time of writing, six Scientific Working Group Meetings and six Inter-governmental Meetings have been held. Interim measures have been established,[933] in which the participating states committed themselves principally to limit bottom fisheries to the existing levels and to prevent it from occurring in areas where it had not yet taken place. The instrument covers high seas areas of the Northwestern Pacific Ocean, defined as those occurring within FAO Statistical Area No. 61, including all areas and marine

[932] *Balton*, *supra* note 925, at 165.

[933] New Mechanisms for Protection of Vulnerable Marine Ecosystems and Sustainable Management of High Seas Bottom Fisheries in the Northwestern Pacific Ocean, Adopted on 2 February 2007, Busan, Republic of Korea; revised on 26 October 2007, Honolulu, Hawaii, United States of America; revised on 18 October 2008, Tokyo, Japan; revised on 20 February 2009, Busan, Republic of Korea; available at http://nwpbfo.nomaki.jp, last visited 26 October 2009.

species other than those already covered by existing international fisheries management instruments, including bilateral agreements and RFMO/As, and closed high seas areas that are surrounded by the EEZ of a single country.

By this clause, pollock fisheries in the Doughnut Hole are excluded from the interim measures. However, (bottom) fisheries for resources other than pollock might be covered by the measures, as long as the parties to the Convention do not adopt measures concerning species other than pollock.[934]

The states participating in the interim measures are planning to create a long-term management mechanism for bottom fisheries, with the intent of covering the whole Pacific Ocean.[935] During the negotiations for this instrument, the relationship between the new mechanism and the Convention should be clarified.[936]

(4) Bilateral Bodies Concerning Fisheries in Arctic Waters

In addition to the RFMOs managing fish stocks in Arctic high seas areas, there are also various, chiefly bilateral, bodies that regulate fisheries between states in their respective EEZs. Since these arrangements are not part of the regime for high seas fisheries governance, they shall only be briefly introduced to provide a complete overview of Arctic fisheries bodies.

(a) Joint Norwegian–Russian Fisheries Commission (JNRFC)

The Joint Norwegian–Russian Fisheries Commission (JNRFC) was established under the Agreement on co-operation in the fishing industry[937] of 1975 (Framework Agreement) to manage the shared stocks of cod, haddock and capelin in the Barents Sea.[938] It institutionalised the cooperation as set out under the management framework consisting of the cited Framework Agreement, the Agreement concerning mutual relations in the field of fisheries of 1976 (Mutual Access Agreement)[939] and the Agreement between Norway and the Soviet Union on provisional practical arrangements on fishing in an adjacent area of the Barents Sea (Grey Zone Agreement).[940]

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[934] See *Takei*, *supra* note 568, p. 244.

[935] *Ibid.*

[936] For the potential solutions, see *ibid.*

[937] Agreement on co-operation in the fishing industry, concluded and entered into force 11 April 1975, 983 UNTS 3, see article III(1).

[938] See Stokke, "The Loophole of the Barents Sea Fisheries Regime," in *Governing High Seas Fisheries* (see note 696), 273–301, at 273.

[939] Agreement on co-operation in the fishing industry, signed 11 April 1975, see article III(1); Agreement concerning mutual relations in the field of fisheries, concluded 15 October 1976.

[940] 'Avtale mellom_Norge_og_Sovjetunionen_om_en _midlertidig_praktisk_ordning_for fisket_i_ et tilstøtende_område_i_Barentshavet' (Agreement between Norway and the Soviet Union on provisional practical arrangements on fishing in an adjacent area of the Barents Sea, Oslo, 11 January 1978. In force 11 January 1978; *Overenskomster med fremmede stater* (1978),

JNRFC sets TAC for each member state and associated countries (EU, Iceland, the Faroe Islands and Greenland) and manages joint compliance efforts and scientific cooperation. As stated, ICES' Arctic Fisheries Working Group (AFWG) provides stocks assessments and TAC advice.[941]

The Mutual Access Agreement provides for reciprocal access to fisheries in EEZ beyond 12 miles subject to coastal state regulation, while the Grey Zone Agreement lays down an enforcement system that is also applicable to a disputed area of the Barents Sea. In this area, called the Grey Zone,[942] the respective Agreement acknowledges parallel jurisdiction. Each party may exercise jurisdiction only over fishing vessels flying its own flag or the flag of third states.[943]

In 2010, Norway and the Russian Federation concluded the Treaty Concerning Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean[944] (Delimitation Treaty). The Grey Zone Agreement will expire when the Delimitation Treaty enters into force. However, there will be a transition period of 2 years to allow for the adaptation of technical rules for the conduct of fishing in the Grey Zone area.

Pursuant to the Delimitation Treaty, the Grey Zone will be absorbed partly by Norwegian and partly by Russian EEZs. Accordingly, the waters and their resources will be subject to the sovereign rights of a single coastal state.[945] The Framework and the Mutual Access Agreement will remain in force for 15 years after the entry into force of the Delimitation Treaty allowing the JNRFC to continue its work. The two agreements have been modified with respect to relative stability and the precautionary approach that are introduced by the Delimitation Treaty.[946]

436). The 'adjacent area', which is substantially bigger than the disputed area, is generally referred to as the Grey Zone, see Olav S. Stokke, Lee G. Anderson and Natalia Mirovitskaya, "The Barents Sea Fisheries," in *The effectiveness of international environmental regimes*: *Causal connections and behavioral mechanisms*, ed. Oran R. Young, 91–154 (Cambridge, Mass: MIT Press, 1999), at 150.

[941] Henriksen, Hønneland and Sydnes, *supra* note 663, at 9, Geir Hønneland, Norway and Russia in the Barents Sea – Cooperation and Conflict in Fisheries Management, Russian analytical digest, vol. 20/07, pp. 9–11, at 9.

[942] The Norwegian Minister of Law of the Sea, Jens Evensen, was the first to label the disputed area 'the Grey Zone', in a public speech in March 1976. A 'grey zone' was a common expression in international maritime law for disputed areas at sea, Kristoffer Stabrun, The Grey Zone Agreement of 1978: Fishery Concerns, Security Challenges and Territorial Interests FNI Report 13/2009, p. 1.

[943] Tore Henriksen and Geir Ulfstein, "Maritime Delimitation in the Arctic: The Barents Sea Treaty," *Ocean Development & International Law* 42 (2011), 1–21, at 2.

[944] Treaty Between the Kingdom of Norway and the Russian Federation Concerning Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean, signed 15 September 2010, English version available at: http://www.regjeringen.no/upload/SMK/Vedlegg/2010/avtale_engelsk.pdf, last visited 17 May 2011. To enter into force, the treaty must be approved by the Norwegian Storting. The Russian Duma has already approved the treaty, see http://www.regjeringen.no/en/dep/ud/campaign/delimitation.html?id=614002, last visited 17 May 2011.

[945] Henriksen/Ulfstein, *supra* note 943, at 8.

[946] *Ibid.*

In its early years, JNRFC did not achieve its goal of conservation and rational use[947] of the shared Barents Sea fish stocks: The stock decline that had begun prior to the establishment of the management regime continued for about a decade after the regime had been concluded.[948] In the 1980s, the collapse of capelin stocks resulted in the massive decline of cod.[949] Around 1990, stocks began to recover and were in a healthy state throughout the decade, before cod stocks again shrank in the late 1990s. Despite ICES' advice to drastically reduce quotas these were often set too high.[950] In addition, there have been considerable IUU landings for cod in the Barents Sea, especially due to widespread IUU fishing in the Russian fishing fleet.[951] However, in the recent years IUU catches have decreased and were close to zero in 2009.[952]

Mention should also be made of the Agreement Concerning Certain Aspects of Cooperation in the Area of Fisheries between Norway, Russia and Iceland,[953] known as the Loophole Agreement. After the extension of fisheries jurisdiction zones by Norway and the then Soviet Union, there was only a small areas of high seas left in the middle of the Barents Sea that came to be referred to as "the Loophole". Fishing in this zone by third state vessels began in the early 1990s, Norway and Russia sought to deal with this by granting fishing rights in their EEZ to these third states in exchange for reducing their fishing activities in the Loophole and adhering to fixed quotas.[954] In 1993, Icelandic vessels began to engage in high seas fisheries in the Loophole and quickly increased their activities. By 1995, they

[947] See article I Framework Agreement.

[948] See Stokke/Anderson/Mirovitskaya, *supra* note 940, at 112.

[949] See Odd Nakken, "Past, present and future exploitation and management of marine resources in the Barents Sea and adjacent areas," *Fisheries Research* 37 (1998), 23–35, at 28.

[950] Hønneland, *supra* note 941, at 10.

[951] Burnett et al., "illegal fishing in arctic waters", WWF International Arctic Programme, Oslo 2008, p. 10/11.

[952] ICES Advice 2010, Book 3, available at: http://www.ices.dk/committe/acom/comwork/report/2010/2010/cod-arct.pdf, last visited 18 May 2011.

[953] Agreement between the Government of Iceland, the Government of Norway and the Government of the Russian Federation Concerning Certain Aspects of Co-operation in the Area of Fisheries, signed 15 May 1999, in force 15 July 1999, 41 Law of the Sea Bulletin 53 (1999). The Agreement is supplemented by two bilateral protocols, the Protocol between the Government of Iceland and the Government of the Russian Federation under the Agreement between the Government of Iceland, the Government of Norway and the Government of the Russian Federation concerning Certain Aspects of Co-operation in the Area of Fisheries, signed 15 May 1999, in force 15 July 1999, reproduced in 14 International Journal of Marine and Coastal Law 488–490 (1999), and the Protocol between the Government of Norway and the Government of Iceland under the Agreement between the Government of Iceland, the Government of Norway and the Government of the Russian Federation concerning Certain Aspects of Co-operation in the Area of Fisheries, signed 15 May 1999, in force 15 July 1999, 41 Law of the Sea Bulletin 56 (1999).

[954] Robin R. Churchill, "The Barents Sea Loophole Agreement: A "Coastal State" Solution to a Straddling Stock Problem," *International Journal of Marine and Coastal Law* 14, no. 4 (1999), 467–490, at 470.

had acquired about 75 % of the unregulated harvest in the area.[955] After long and difficult negotiations, the Agreement and its two accompanying protocols were finally concluded in 1999. Essentially, these instruments grant reciprocal access to their EEZ to fish according to fixed quotas. Moreover, and most importantly, fish could only be taken in the EEZ and parties had to refrain from "any claims for additional fishing possibilities on that stock".[956] As a consequence, Iceland had to cease fishing in the Loophole.[957]

(b) International Pacific Halibut Commission (IPHC)

The International Pacific Halibut Commission (IPHC) was created by a Convention between the governments of the US and Canada in 1923.[958] The original Halibut Convention has been replaced and revised several times. The current text of the Convention is comprised by the 1979 Protocol,[959] and provides a mandate for research on and management of the stocks of Pacific halibut within the Convention waters. These include "without distinction areas within and seaward of the territorial sea and internal waters of that Party"[960] in the North-Pacific Ocean and the Bering Sea.[961]

The IPHC has authority to research and manage Pacific halibut stocks. To that end, it may divide the Convention waters into different areas, establish closed seasons in each area and limit the size of the fish and the catch quantity for each area.[962] It has created ten regulatory areas and one closed area.[963] However, the

[955] Olav S. Stokke, *supra* note 938, at 277.

[956] Article 4 Loophole Agreement.

[957] See Churchill, *supra* note 954, at 472.

[958] Convention for the Preservation of the Halibut Fishery, signed in Washington, DC, the United States of America, on 2 March 1923. A new Convention between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea was signed in Ottawa, Canada, on 2 March 1953 and entered into force on 28 October 1953, 222 UNTS 78, as amended by a Protocol Amending the Convention (signed at Washington, DC., on March 29, 1979), U.S. National Marine Fisheries Service, Pacific halibut fisheries; catch sharing plan, Final rule; annual management measures for Pacific halibut fisheries, Federal Register 69(39): 9231–41. The Commission was the "first of its kind", Bond and McDorman, *supra* note 921, at 118.

[959] See *supra* note 958.

[960] Section 2(k) of the regulations governing the Pacific halibut fishery in 2004 under the Convention Between the United States and Canada for the Preservation of the Halibut Fishery of the North Pacific Ocean and Bering Sea, U.S. National Marine Fisheries Service, Pacific halibut fisheries; catch sharing plan, Final rule; annual management measures for Pacific halibut fisheries, Federal Register 69(39): 9231–41 (hereinafter: Halibut Convention).

[961] As specified in Section 6 of the regulations governing the Pacific halibut fishery in 2004 under the Convention Between the United States and Canada for the Preservation of the Halibut Fishery of the North Pacific Ocean and Bering Sea.

[962] Article III(3) Halibut Convention.

[963] International Pacific Halibut Commission, Regulations, IPHC Regulatory Areas, available at: http://www.iphc.int/library/regulations.html, last visited 3 October 2011.

IPHC does not directly manage fish stocks, the Commissioners forward their recommendations to the respective governments, which then consider and implement them.[964] Each party has the right to enforce the Halibut Convention and any regulation adopted pursuant to it, against its own nationals and fishing vessels, regardless whether they are in its waters or the waters of the other party. They may also enforce the Convention against all vessels operating within its jurisdiction.[965]

(c) Pacific Salmon Commission (PSC)

The Pacific Salmon Commission (PSC) was established by the Pacific Salmon Treaty[966] (PST) concluded between Canada and the United States "to cooperate in the management, research and enhancement of Pacific salmon stocks".[967] The PST regulates Pacific salmon stocks that originate in the waters of one Party and are subject to interception[968] by the other Party, affect the management of stocks of the other Party or affect biologically the stocks of the other Party, article I(6) PST.

The PSC advises and makes recommendations regarding the management of relevant stocks (Article II(8) PST). It is comprised of two sections representing both Member States and requires the approval of both in order to make decisions or recommendations (Article II(1) and (6) PST). To assist the Commission, the PST created panels representing various geographic areas where Pacific salmon originate (Article II(18) and (19), Annex I PST), for example, the Yukon River Panel for salmon originating in the Yukon River (Annex I(e) PST).

The Yukon River originates in the Canadian territory Yukon and flows through Alaska into the Bering Sea. It is the largest salmon-bearing river in Alaska.[969]

In 2002, Canada and the US concluded an agreement on Yukon River salmon to ensure effective conservation and management of stocks originating in the Yukon River, which became Chapter 8 of the PST. However, the PSC has no legal responsibility to administer the Yukon Agreement or to oversee the work of the Yukon Panel, the body that gives advice to national management entities.[970]

[964] Article III(3) Halibut Convention.

[965] Article II(1) Halibut Convention.

[966] Treaty between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon, Ottawa, 28 January 1985. In force 18 March 1985.

[967] Preamble PST, *supra* note 966.

[968] Interception is defined as the harvesting of salmon originating in the waters of one Party by a fishery of the other Party, article I(4) PST, *ibid*.

[969] Philip A. Loring and Craig Gerlach, "Food Security and Conservation of Yukon River Salmon: Are We Asking Too Much of the Yukon River?" *Sustainability*, no. 2 (2010), at 2969.

[970] See no. 14 Yukon River Agreement, chapter 8 PST, available at: http://www.psc.org/pubs/treaty.pdf, last visited 3 October 2011.

(d) Intergovernmental Consultative Committee (ICC)

The US–Russia Intergovernmental Consultative Committee (ICC) was established by a bilateral agreement[971] to establish a common understanding of the principles and procedures to provide for cooperation between the Parties in areas of mutual interest concerning fisheries.[972]

The parties to this agreement shall coordinate conservation, exploitation and management of the living marine resources of the ABNJ of the Bering Sea and the North Pacific Ocean, with a specific focus on dealing with IUU fishing.[973] The ICC, however, has only authority to review all matters relating to the implementation of the agreement and to issue recommendations.[974]

(5) Comparison to CCAMLR

This outline of the regional fisheries bodies and arrangements relevant for the Arctic showed that all of them suffer from deficits of some kind. One legal instrument that might serve as a role model for improving fisheries conservation in the Arctic[975] is the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR).[976] This Convention was adopted as part of the Antarctic Treaty System (ATS) with the aim of conserving Antarctic marine living resources.[977] Its creation was triggered by concerns that a rise in krill catches in the Southern Ocean could place the populations of krill and dependent species and thus the entire Antarctic marine ecosystem at risk.[978]

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[971] Agreement between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics on Mutual Fisheries Relations, Moscow, 31 May 1988. In force 28 October 1988, 2191 UNTS 3, including Annex and as amended, Washington, 11 March 1993 and 15 September 1993, in force 4 April 1994. The original agreement would have expired in 1993, but was extended several times, last time until December 31, 2013 by an exchange of notes in Moscow on March 28, 2008, and September 19, 2008, see George W. Bush, Message to the Congress of the United States, January 15, 2009, available at: http://georgewbush-whitehouse.archives.gov/news/releases/2009/01/20090115-8.html, last visited 15 March 2011. *Burnett*, *supra* note 951, p. 20.

[972] Article I.

[973] See Article XI(2).

[974] Article XIV(4) and (5).

[975] Rayfuse suggests using the CCAMLR model as a starting point for developing a comprehensive Arctic Treaty regime, *id*., *supra* note 261, at 215.

[976] Convention on the Conservation of Antarctic Marine Living Resources, concluded 20 May 1980, entered into force 7 April 1982.

[977] Article 2(1) CCAMLR, Basic Documents (CCAMLR, Hobart, Australia, 2002); (1980) 19 International Legal Material 837; conservation is defined to include rational use, article 2 (2) CCAMLR.

[978] Denzil G. M. Miller, Eugene N. Sabourenkov and David C. Ramm, "Managing Antarctic marine living resources: The CCAMLR approach," *International Journal of Marine and Coastal Law* 19, no. 3 (2004) 317–363, at 319.

CCAMLR stands out from other RFMOs because of the special natural characteristics of the Convention Area, the integration of the CCAMLR into the ATS and the related sovereignty issues as well as the conservationist aim of the Convention.[979]

In many respects, the CCAMLR embodied a new approach to fisheries management: Its conservationist approach as reflected by the adherence to multi-species management and the ecosystem-based and precautionary approaches laid down in article II of the Convention were unprecedented and pioneering.[980]

Although these principles are nowadays part of many instruments dealing with harvesting and conservation of fish, the CCAMLR remains the embodiment of an extraordinary regulatory regime.[981] It also differs from other fisheries conventions in terms of its membership: Whereas most RFMOs restrict participation to states intending to harvest,[982] CCAMLR allowed any state to sign the newly concluded Convention, regardless of its interest in exploitation of the regulatory area.[983] Subsequently, it remained open for accession to any state interested in harvesting *or research*.[984] Thus, CCAMLR permits membership of both states interested in exploitation, and those mainly interested in conservation and research.[985]

The Convention is applicable to the Antarctic marine living resources[986] in the area south of 60° South latitude and to Antarctic marine living resources in the area between that latitude and the Antarctic Convergence which form part of the Antarctic marine ecosystem (Article I(1) CCAMLR). It is the only instrument in the ATS whose regulatory area differs from the less extensive spatial coverage of the Antarctic Treaty.[987] For the first time, the ATS used the meaning of the Antarctic Convergence[988] to delimit the maritime area under Antarctic influence.[989]

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[979] Erik Jaap Molenaar, "CCAMLR and southern ocean fisheries," *International Journal of Marine and Coastal Law* 16, no. 3 (2001) 465–499, at 465.

[980] Miller, Sabourenkov and Ramm, *supra* note 978, at 319; Molenaar, *supra* note 979, at 497; Karl-Hermann Kock, *Understanding CCAMLR's approach to management* (Tasmania: CCAMLR, 2000), at iii.

[981] Molenaar, *supra* note 979, at 497.

[982] An exception is the IWC Convention, article X(2), Washington DC, 2 December 1946.

[983] See article XXVI CCAMLR.

[984] See article XXIX CCAMLR.

[985] Kaye, *supra* note 926, at 84.

[986] Excluding whales and seals, which are the subject of other conventions – namely, the International Convention for the Regulation of Whaling and the Convention for the Conservation of Antarctic Seals, Article VI CCAMLR.

[987] Molenaar, *supra* note 979, at 471. The Antarctic Treaty area extends south of 60° South (Article VI Antarctic Treaty, December 1, 1959, 402 UNTS 71).

[988] The Antarctic Convergence is the "zone where cold, less saline, northward-flowing Antarctic water encounters the warmer, southward-flowing, sub-Antarctic waters of the Atlantic, Indian and Pacific Oceans.", Kock, *supra* note 980, at 1.

[989] Rothwell, *supra* note 88, at 125.

Harvesting of marine living resources within the limits of the spatial scope of the Convention is permitted subject to the conditions laid down in Article II (3) CCAMLR. The Convention sets up a Commission to manage the marine living resources of the area for which it is responsible, article VII(1) CCAMLR.

This Commission sets policy and regulates activities associated with the rational utilisation and management of marine living resources in the Southern Ocean. It receives advice from its Scientific Committee (SC-CAMLR), based on assessments undertaken by its Working Group on Ecosystem Monitoring and Management (WG-EMM) and the Working Group on Fish Stock Assessment (WG-FSA).

The conservation measures adopted by the Commission are generally binding on CCAMLR members, although they do have the option to initiate an invocation procedure provided for in Article IX(6) CCAMLR.

Current fisheries in the CCAMLR Area include toothfish, mackerel icefish and Antarctic krill. While the latter is considered one of the few underexploited stocks worldwide,[990] the former two are likely to be fully exploited, with toothfish stocks depleted in some areas of the Indian Ocean due to IUU fishing. In fact, the huge size and the climatic conditions of the Southern Ocean make effective enforcement measures against IUU fishing very difficult,[991] a circumstance that is considered one of the major challenges facing CCAMLR.[992]

IUU fishing by third-party vessels undermines CCAMLR's conservation efforts especially with regard to implementing an ecosystem approach.[993] Besides the size of the convention area, the high costs of fishing in the Southern Ocean are another factor favouring IUU fishing. Both these aspects have possible parallels in the Arctic, urging high seas fisheries management in the High North to learn from the experiences of the circumpolar South.[994]

cc) Deficits Relating to High Seas Fisheries Conservation and Management

This overview of the existing fisheries bodies responsible for conservation and management of fish stocks in the Arctic has revealed considerable shortcomings within the institutional governance regime.

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[990] See Stephen Nicol, Jacqueline Foster and So Kawaguchi, "The fishery for Antarctic krill - recent developments," *Fish and Fisheries* (2011), 1–11, at 1.

[991] Kaye, *supra* note, p. 437.

[992] Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), *CCAMLR's Management of the Antarctic* (Hobart, Australia, 2001), p. 3.

[993] *Ibid*., p. 438 et seq.

[994] The ATS does not include high seas; as sovereignty claims have been frozen with the conclusion of the Antarctic Treaty, there were no coastal states that could have established any jurisdiction over maritime zones in the Southern Ocean. Accordingly, the Southern Ocean could be regarded as high seas area, see Patrizia Vigni, "Antarctic Maritime Claims: Frozen Sovereignty and the Law of the Sea," in *The law of the sea and polar maritime delimitation and jurisdiction*, *supra* note 74, 85–104 (Hague: Nijhoff, 2001).

(1) Incomplete Coverage with RFMOs

Leaving aside deficits within relevant entities, what becomes most apparent when examining Arctic high seas fisheries conservation management is the lack of responsible bodies.

As stated above, apart from the central Arctic Ocean, there are three pockets of high seas in the seas bordering the Arctic Ocean: the "Banana" hole in the Norwegian Sea, the "Loophole" in the Barents Sea and the "Doughnut" hole in the Bering Sea,[995] which are managed by an RFMO and/or a regional arrangement with respect to certain species.[996]

However, the majority of the Arctic marine area is not covered by an RFMO or other arrangement managing other species than tuna or tuna-like species and anadromous species.[997]

In the currently ice-covered high seas area in the central Arctic Ocean, NEAFC has a mandate over the "European" wedge, while other sectors in the Central Arctic Ocean do not have an RFMO or arrangement.[998] There are no international management mechanisms for fisheries north of the Bering Strait, nor is there an RFMO to manage Alaska Pollock across the whole North Pacific.[999]

While there are various bilateral arrangements between the relevant Arctic Ocean coastal states on the conservation and management of shared fish stocks within the Arctic marine area, there seems to be no such arrangement between Canada and Greenland, between Canada and the US regarding the Beaufort Sea and between the Russian Federation and the US concerning the Chuckchi Sea.[1000]

As previously stated, the Arctic Council does not address fisheries issues at all. Thus, there is currently no single body responsible for the management and protection of Arctic fish stocks.

However, as many valuable arctic fish stocks such as herring and cod, migrate northward and move into the high seas, it is clear that there will be a need for a comprehensive management regime to govern and protect Arctic fish stocks in the near future.

(2) Institutional Deficits

In addition to these gaps in coverage, the organisations responsible for fisheries conservation management do not ensure sustainable management.

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[995] Molenaar, *supra* note 246, at 149.

[996] Alf H. Hoel, "Do We Need a New Legal Regime for the Arctic Ocean?," *International Journal of Marine and Coastal Law* 24 (2009), 443–456, at 451.

[997] Molenaar and Corell, *supra* note 102, p. 25.

[998] *Ibid.*

[999] *Balton/Hoydal*, Policy Options for Arctic Environmental Governance, prepared by the Fisheries Working Group, 5 March 2009, p. 1.

[1000] Molenaar/Corell, *supra* note 102, p. 26.

Firstly, the RFMOs responsible for parts of the marine Arctic illustrate the fragmentation of international environmental law. Twelve different agreements have been concluded and set up their individual bodies, in some instances, with partially geographically overlapping mandates. For instance, NEAFC is the main body responsible for the high seas and transnational pelagic fisheries in the Barents Sea, while in the same area, the Norwegian–Russian fishing Commission is the competent organisation for demersal fisheries.[1001]

The fisheries conservation management agreements have generally been concluded with respect to single species or a single category of stocks such as anadromous fish stocks, often as a response to the depletion of stocks. As they all have a limited area of responsibility in the marine Arctic, a multi-species, circumpolar RFMO similar to the CCAMLR is lacking.

Furthermore, individual RFMOs still fall short of applying an ecosystem approach to fisheries and of basing their decisions on the precautionary approach. Scientific recommendations are ignored or based on false catch data and consequently set too high. Opt-out provisions further inhibit the effectiveness of decisions. Although many RFMOs have reformed their framework to align it with the FSA standards,[1002] or are in the process of modernisation, ultimately the success of RFMOs depends on the political will and efforts of the Contracting Parties, which often lack the commitment to strengthen the regulatory authority of the organisation and to adhere to its decisions.

(3) IUU Fishing

Even where an RFMO does achieve sustainable fisheries conservation management *per se*, its success can still be undermined by IUU fishing. In ABNJs IUU fishing is one of the most serious threats to marine biodiversity.[1003] However, the vast and inhospitable Arctic marine environment makes monitoring IUU fishing a major challenge. Modern vessel tracking technology is essential to tackle the issue, combined with a broad ratification and implementation of the Port State Agreement. Additionally, data exchange such as that with respect to blacklisted vessels between NEAFC and NAFO, is an important step towards reducing—or in some areas of the Arctic: preventing—IUU fishing.

[1001] Tavis Potts, "The Management of Living Marine Resources in the Polar Regions," in *Polar Law Textbook*, ed. Natalia Loukacheva, 65–79 (Copenhagen: Nordic Council of Ministers, 2010), at 75.

[1002] Unfortunately, the FSA does not explicitly require RFMOs established before 1995 to upgrade to be in accordance with its requirement, but just calls for strengthening of RFMOs, article 13 FSA, see Molenaar, *supra* note 660, at 547.

[1003] UNGA A/61/65, p. 10.

(4) Information Gaps

Successful fisheries management depends on accurate and reliable data about the status of stocks and dependent species as well as the nature and extent of fishing activities. This knowledge base is often patchy, particularly concerning the high seas.[1004] To apply the ecosystem approach to fisheries however, those systems must be understood—a goal that is far from accomplished in the Arctic.[1005] Full comprehension of the complex Arctic marine ecosystems is further complicated by the implications of climate change listed above. As seen, a moderate warming might benefit Arctic fish stocks, but little is known about the effects of a dramatic warming of Arctic waters.

5 Concluding Remarks

The Arctic is a region in which the gaps and weaknesses of the current regime for the conservation and management of fisheries in ABNJ have become virulent. The analysis above has shown that the international legal and institutional regime still suffers from considerable shortcomings: UNCLOS' provisions for high seas fisheries are insufficient to ensure adequate conservation of fish stocks, leaving too much of the freedom of fishing on the high sea s intact and providing too little guidance on the measures that have to be taken in managing high seas fisheries. The FSA, which elaborated on UNCLOS' regulations, falls short of including all fish stocks, as it does not apply to discrete high seas fish stocks. Other international legal instruments relating to high seas fisheries suffer from their non-binding character or incomplete participation of states.

Furthermore, both UNCLOS and the FSA rely to a great extent on RFMOs that should be established in order to manage and conserve straddling and highly migratory fish stocks. Especially the FSA prescribes these organisations an important role when stating the rule that only those states shall be allowed to fish that are members to the respective RFMO or apply its conservation and management measures.

Thus, the incomplete coverage of the marine Arctic by responsible RFMOs constitutes a considerable shortcoming in terms of management and conservation of high seas fish stocks. Large parts of the region are not under the responsibility of an RFMO with competence over target species other than tuna or tuna-like and anadromous species.

Additionally, existing RFMOs often show sub-standard frameworks and performance, e.g. not applying the precautionary and ecosystem approaches, constantly setting TAC too high, providing for opt-out procedures for conservation measures

[1004] UNGA, A/62/66/Add.2, p. 67.

[1005] See Molenaar, *supra* note 246, at 165.

preventing these from becoming binding on all members of the RFMO, showing weak compliance and enforcement measures etc.

On top of that, even where an RFMO complies with modern conservation principles, fish stocks are often threatened by IUU fishing—a phenomenon that represents one of the most serious threats to marine biodiversity in ABNJ. Particularly in the vast marine Arctic, monitoring of IUU fishing poses a huge challenge.

The disclosed deficits of the legal and institutional framework for fisheries in ABNJ present a threat of unsustainable exploitation of fish stocks that is aggravated by the special circumstances in the marine Arctic with its vulnerable and harsh environment and the present state of change due to climate change. While risks resulting from an imperfect fisheries conservation and management regime are not fundamentally different in the Arctic than anywhere else in the world, the Arctic case is special in that many areas where high seas fisheries are likely to take place in the future are currently covered with ice for large parts of the year and thus have not yet been subjected to large-scale fishing.

This therefore affords a unique opportunity to employ an anticipatory approach[1006] and adopt a comprehensive governance system for sustainable management before serious damage occurs.[1007] Given that almost all other oceans worldwide are overfished, there is naturally great interest in the exploitation of valuable fish stocks in the Arctic, with the melting ice providing a starting signal for fisheries. However, the opening up of the Arctic Ocean high seas areas also opens up multiple stressors to fish stocks; spatially, other human activities will compete with fishing and affect them by pollution or other impacts.[1008] The interconnectedness of all these activities and potential dangers to the environment makes the application of an ecosystem-based approach to conservation and management imperative.

The Arctic could be considered a test case for the legal framework for high seas fisheries governance, or more broadly, for integrated and comprehensive ocean governance and—depending on the outcome of the enhancement process—even as a role model for necessary adaptations and improvements.

[1006] Donald R. Rothwell, "Polar Lessons for an Arctic Regime," *Cooperation and Conflict* 29 (1994) 55–76, at 71.

[1007] Tatiana Saksina, Arctic Frontiers conference, January 20th 2009, p. 2, available at: http://www.arctic-frontiers.com/index.php?option=com_docman&task=cat_view&gid=82&Itemid=155.

[1008] Molenaar, *supra* note 246, p. 149.

Chapter 4
Possible Ways for Enhancement

As has been shown in this research, the changes induced by global warming facing the Arctic imply threats for the marine environment in the region that would not be subject to comprehensive management pursuant to the current legal framework. This leaves the question as to what possible ways governance of the Arctic marine environment can be improved to eliminate or at least ameliorate these deficits.

I The Current Debate

Worldwide interest in the region has grown, particularly since the record-breaking retreat of Arctic sea ice in 2007. The dramatic consequences of climate change for the environment in the region combined with the growing accessibility to the resource-rich area caught the attention of the media, stakeholders and the general public. This brought the governance framework for the Arctic into the public focus and discussions about its adequacy as a safeguard for sustainable management were initiated.

Among legal academics, policy-makers and NGOs, various suggestions have been put forward as to how to deal with the increasing environmental risks. Proposals range from achieving improvements within the current legal regime to the conclusion of a new binding Arctic Treaty for environmental protection.

Interestingly, voices suggesting alternatives to the current governance regime for the Arctic are no longer solely coming from legal scholars and NGOs, but also from states, the EU and permanent participants of the Arctic Council.[1]

The ICC and Inuit leaders have criticised the Arctic Council as leaving aside many sensitive issues such as security, sovereignty, national legislation relating to marine mammal protection and commercial fisheries. This critique can be

[1] Timo Koivurova, "Limits and possibilities of the Arctic Council in a rapidly changing scene of Arctic governance," *Polar Record* 46, no. 2 (2010) 146–156, at 145.

L. Weidemann, *International Governance of the Arctic Marine Environment*, Hamburg Studies on Maritime Affairs 27, DOI 10.1007/978-3-319-04471-2_4,

interpreted as a preference for stronger Arctic governance than provided for by the Arctic Council in its current form.[2]

Even the US, which had advocated a soft law approach for the Arctic Council, has recommended considering:

> new or enhanced international arrangements for the Arctic to address issues likely to arise from expected increases in human activity in that region, including shipping, local development and subsistence, exploitation of living marine resources, development of energy and other resources, and tourism.[3]

The European parliament suggested in its resolution of 9 October 2008 that the European Commission open international negotiations designed with the aim of creating an international treaty for the protection of the Arctic, which should cover, as a minimum, the ABNJ in the Arctic Ocean.[4]

The European Commission, however, rejected the parliament's suggestion and argued for the "full implementation of already existing obligations, rather than proposing new legal instruments".[5] Yet, at the same time, the Commission recognised the serious shortcomings of the current Arctic governance regime and considered the establishment of new, multi-sectoral frameworks for integrated ecosystem management as a possible remedy.[6]

By the same token, some legal scholars and policy-makers have argued that the necessary improvements can be achieved within the current governance regime,[7] which means primarily without the creation of a new Arctic-wide treaty for environmental protection in the region.[8]

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[2] *Ibid*., at 146.

[3] US Arctic region policy 2009, national security presidential directive HSPD – 25, 9 January 2009, available at: http://www.fas.org/irp/offdocs/nspd/nspd-66.htm, last visited 4 December 2009.

[4] European Parliament resolution of 9 October 2008 on Arctic governance, available at: http://www.europarl.europa.eu/sides/getDoc.do?type=TA&language=EN&reference=P6-TA-2008-0474, last visited 4 December 2009.

[5] Communication from the commission to the European parliament and the council, The European Union and the Arctic region, 20 November 2008, COM(2008) 763, p. 10.

[6] *Ibid*.

[7] See Stuart Chapin and Neil Hamilton, "Policy Options for Arctic Environmental Governance: Prepared by the Environmental Governance Working Group," (Arctic Transform, 5 March 2009) (integrated management approach); Tavis Potts and Clive H. Schofield, "The Arctic," *International Journal of Marine and Coastal Law* 23, no. 1 (2008), 151–176, at 173; In favour of working within the existing regime, see generally Working Group on the Protection of the Marine Environment, Report of the Third Ministerial Conference on the Protection of the Arctic Environment 83 (1996), available at: http://pame.is/images/stories/Work_Plans/Framework_documents/PAME-1996-Report.pdf; Hans Corell, "Reflections on the possibilities and limitations of a binding legal regime," *Environmental Policy and Law* 37, no. 4 (2007), 321–324, at 321; Ilulissat Declaration, Arctic Ocean Conference Ilulissat, Greenland, 27–29 May 2008, available at: http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf, last visited 26 March 2012.

[8] Alf H. Hoel, "Do We Need a New Legal Regime for the Arctic Ocean?," *International Journal of Marine and Coastal Law* 24 (2009), 443–456, at 455; Corell, "Reflections on the possibilities and

Not surprisingly, Arctic States seeking to maintain their supremacy in the region argue the current governance system is sufficient to prevent interference by other interested players that might engage in an overarching treaty. This position has been clearly expressed by the cited Ilulissat Declaration.

In essence, opponents of a binding Arctic Treaty favour the existing soft law system with the Arctic Council at its core as opposed to a new and binding Convention, stressing that UNCLOS already provides a legal regime to regulate the Arctic.[9]

Even those opposing an Arctic Treaty, however, acknowledge the need for improvement of the current legal regime[10] and advocate its implementation along with broad ratification of relevant agreements.[11]

In addition to the recognition that the existing legal framework needs strengthening through enhanced implementation and universal ratification of the relevant legal instruments, there are also proposals for improved governance of the Arctic marine environment concerning individual elements of the legal regime.

II Enhancements Within the Current Legal Regime

1 Sector-Specific Enhancements

Suggestions for improving environmental protection in the marine Arctic first of all concern individual sectors.

limitations of a binding legal regime", *supra* note 7, at 321.; Douglas Johnston, "The Future of the Arctic Ocean: Competing Domains of International Public Policy," *Ocean Yearbook* 17 (2003), 596–624, at 623 *et seq*.; Oran Young, "Whither the Arctic 2009? Further developments," *Polar Record* 45, no. 2 (2009) 179–181, at 441.

[9] See Ilulissat Declaration, *supra* note 7.

[10] See J. A. Roach, "International law and the Arctic: A guide to understanding the issues," *Southwestern Journal of International Law* 15, no. 2 (2009) 301–326, at 320; Corell, "Reflections on the possibilities and limitations of a binding legal regime", *supra* note 7, at 324; *id*., "The Arctic: An Opportunity to Cooperate and Demonstrate Statesmanship," *Vanderbilt Journal of Transnational Law* 42, no. 4 (2009), 1065–1079.

[11] See e.g. Corell, "Reflections on the possibilities and limitations of a binding legal regime", *supra* note 7, at 322, 324; Corell, "The Arctic: An Opportunity to Cooperate and Demonstrate Statesmanship", at 1069; Hoel, "Do We Need a New Legal Regime for the Arctic Ocean?", *supra* note 8, at 455.

a) Creation of Arctic-Wide RFMO

As the previous analysis of the international fisheries regime has shown, gaps in Arctic fisheries governance relate *inter alia* to the incomplete coverage of high seas waters.

With regard to the prospect of new fishing opportunities likely to arise in the Arctic, it is necessary to ensure sustainable international management for those areas that are not currently covered by an RFMO/A competent for other fish stocks than tuna or tuna-like species and anadromous species. It would be desirable to establish these management mechanisms to prevent unregulated fisheries activities building up.[12]

Comprehensive fisheries research would be necessary as a starting point. Current stock levels and fishing activities would need to be monitored, in order to allow for future scenarios for new fishing opportunities and their potential impacts to be developed.

As noted above, it is highly unlikely that the Arctic Council will transform into an RFMO[13] due to the explicit exclusion of fishery issues from its scope of competence, which was recently affirmed by its members. This does not prevent the assessment of fisheries issues within the Arctic Council framework, although this may also be done by external bodies, e.g. within ICES.[14]

An Arctic-wide RFMO could be established on the basis of an existing RFMO in the region. It has been suggested that the spatial scope of NEAFC could be extended, either moderately[15] or extensively to include the complete Arctic marine area.[16] Other scholars propose the creation of a new RFMO.[17] Regardless of how,

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[12] See Communication from the Commission to the European Parliament and the Council, The European Union and the Arctic Region, Brussels, 20.11.2008, COM(2008) 763 final, p. 8.

[13] Heidar suggests that the process for establishing a new RFMO covering those parts of the marine Arctic that are not by NEAFC, could be initiated within the Arctic Council, *id*., "The Legal Regime of the Arctic Ocean". In: *New Chances and New Responsibilities in the Arctic Region*: *Papers from the International Conference at the German Federal Foreign Office in cooperation with the Ministries of Foreign Affairs of Denmark and Norway*, *11–13 March 2009*, *Berlin*, ed. Georg Witschel et al., (Berlin: Berliner Wissenschafts-Verlag), 635–640, at 639.

[14] See Erik J. Molenaar, "Arctic Fisheries Conservation and Management: Initial Steps of Reform of the International Legal Framework," in *The Yearbook of Polar Law*, ed. Gudmundur Alfredsson and Timo Koivurova, 427–64 1 (Leiden Boston: Martinus Nijhoff Publishers, 2009), at 452.

[15] Timo Koivurova, Erik J. Molenaar and David L. VanderZwaag, "Canada, the EU, and Arctic Ocean Governance: A Tangled and Shifting Seascape and Future Directions," *Journal of Transnational Law & Policy* 18 (2008–2009) 247–288, at 278; Molenaar, *supra* note 14, at 454.

[16] Communication from the Commission to the European Parliament and the Council, The European Union and the Arctic Region, Brussels, 20.11.2008, COM(2008) 763 final, p. 8.

[17] Rob Huebert and Brooks B. Yeager, "A New Sea: The Need for a Regional Agreement on Management and Conservation of the Arctic Marine Environment," (January 2008), at 26; Jennifer Jeffers, "Climate Change and the Arctic: Adapting to Changes in Fisheries Stocks and Governance Regimes," *Ecology Law Quarterly* 37 (2010) 917–978, at 975.

the result should be one or several properly coordinated state-of-the-art RFMO(s) for the entire marine Arctic.

A first step in this direction was taken by the US through Senate Joint Resolution 17[18] calling for the creation of a new international fisheries management organisation for the Arctic, and seeking a halt in the expansion of Arctic commercial fishing activities until this is achieved.[19]

b) Mandatory Polar Code

With respect to the prospect of expanded Arctic shipping traffic and the ensuing environmental risks that have been detailed previously, several authors stress the significance of a comprehensive mandatory Code for shipping in Polar Regions.[20] The AMSA Report in particular has highlighted that shipping activity in the Arctic is very likely to increase considerably in the near future and that the risks attached are not sufficiently provided for in current legal instruments.

As discussed above, the currently non-binding "Guidelines for Ships Operating in Polar Waters" are to be transformed into a mandatory Polar Code. However, the provisions regarding environmental protection have not been elaborated. Therefore, it remains to be seen whether the Code really embodies a decisive improvement for governance of shipping in the marine Arctic. Existing deficits including the incomplete coverage of the whole marine Arctic and all vessels operating there, have already become apparent.

2 Area-Based Enhancements

Area-based measures such as MPAs or "Special Areas" under MARPOL could be used to provide measures additional to shipping-related environmental risks.

a) Establishment of MPAs and/or PSSAs/Associated Measures/Special Areas

As discussed, very little of the Arctic marine environment has been designated as MPAs,[21] even though areas with an increased level of protection are essential for

[18] S.J. Res. 17 from January 3rd, 2008.

[19] See Michael Distefano, "Managing Arctic Fish Stocks," *Sustainable Development Law & Policy* 8, no. 3 (2003), at 13.

[20] Heidar, *supra* note 13, at 639; Philippe Sands, *Principles of international environmental law*, 2nd ed. (Cambridge: Cambridge Univ. Press, 2003), at 521.

[21] Timo Koivurova, "Governance of protected areas in the Arctic," *Utrecht Law Review* 5, no. 1 (2009) 44–60, at 45.

the protection of the marine Arctic, including the tendency of many Arctic marine species to congregate in large numbers in few critical zones, for instance in polynyas.[22]

To enhance protection of sensitive areas of the Arctic marine environment from pollution, the IMO should designate "special areas" under MARPOL as has been done for the whole Antarctic area.[23] This has seen the zone south of 60° latitude designated as a special area under all three annexes and established a very high standard for discharges under Annex I, namely a prohibition on any discharge of oil or oily mixtures from any ship. The oceanographic and ecological conditions for special area designation, possibly also the required ship traffic conditions, as set out in the 2002 IMO Guidelines for the Designation of Special Areas under MARPOL 73/78, are also present in the Arctic.[24]

In addition, certain Arctic marine areas could also be designated as PSSAs due to their particular sensitivity to international shipping. An area must satisfy three requirements to be eligible as a PSSA: First, the area must feature at least one of the ecological, social, cultural, economic, scientific and educational criteria listed in the Revised PSSA Guidelines. Second, the area must be especially vulnerable to the impacts of international ship traffic. Lastly, there must be an IMO measure to address the identified vulnerability, known as an associated protective measure, that may consist of a combination of elements, including areas to be avoided, traffic

[22] Jim Johnston, Gregg Legare and Jeanne Pagnan, *Protected areas of the Arctic*: *Conserving a full range of values* (Ottawa: CAFF Secretariat, 2002), p. 7.

[23] See Aldo Chircop, "International Arctic Shipping: Towards Strategic Scaling-Up of Marine Environment Protection," in *Changes in the Arctic environment and the law of the sea*, ed. Myron H. Nordquist, John N. Moore and Tomas H. Heidar, Center for Oceans Law and Policy (Leiden: Martinus Nijhoff Publishers, 2010), 177–201, at 185; Heidar, *supra* note 13, at 640; Sands, *supra* note 20, at 521.

[24] The oceanographic conditions must be such that they "may cause the concentration or retention of harmful substances in the waters or sediments of the area, including particular circulation patterns (e.g. convergence zones and gyres) or temperature and salinity stratification; long residence time caused by low flushing rates; extreme ice state; and adverse wind conditions." The ecological conditions must indicate "that protection of the area from harmful substances is needed to preserve: depleted, threatened or endangered marine species; areas of high natural productivity (such as fronts, upwelling areas, gyres); spawning, breeding and nursery areas for important marine species and areas representing migratory routes for sea-birds and marine mammals; rare or fragile ecosystems such as coral reefs, mangroves, seagrass beds and wetlands; and critical habitats for marine resources including fish stocks and/or areas of critical importance for the support of large marine ecosystems." The vessel traffic characteristics are fulfilled if "[t]he sea area is used by ships to an extent that the discharge of harmful substances by ships when operating in accordance with the requirements of MARPOL 73/78 for areas other than Special Areas would be unacceptable in the light of the existing oceanographic and ecological conditions in the area.", Guidelines for the Designation of Special Areas under MARPOL 73/78, IMO Resolution A.927(22), adopted on 29 November 2001, Guidelines for the Designation of Special Areas under MARPOL 73/78 and Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas, Annex I, 2.3–2.6.

re-routing and separation schemes, mandatory ship reporting, discharges, restrictions and designation as a special area.[25]

Additionally, risks from shipping can also be mitigated by the establishment of ships routeing and ship reporting systems under Regulations 10 and 11, Chapter V SOLAS. Available instruments include recommended routes, precautionary areas and areas to be avoided. These measures can be established to improve safety of life at sea, safety and efficiency of navigation, and also to enhance the protection of the marine environment.[26] They have already been applied in certain parts of the marine Arctic, such as Alaska's Prince William Sound and waters off the coast of Norway, Iceland and Greenland.[27]

b) Creation of National Parks

One author suggests the creation of an international world park covering the Arctic Ocean "using the baselines of the eight surrounding States."[28] It is also recommended that a moratorium be established on resource extraction and development within this park.[29]

To achieve the greatest level of environmental protection, a protected "no development" zone should be established within the Arctic Ocean, subject to international management. However, as great parts of the marine Arctic are under the sovereignty of the littoral states, this vision seems quite unrealistic—especially considering the vast natural resources present or expected to be found in the seabed of the Arctic Ocean. A moratorium on resource extraction also appears to be wishful thinking. The challenge concerning improvement of environmental protection in the marine Arctic consists of reconciling the need for the preservation of the environment and the requirements of sustainable development.

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[25] According to the 'Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas', "[i]n some cases a PSSA may be identified within a Special Area and vice versa. [. . .] [T]he criteria with respect to the identification of PSSAs and the criteria for the designation of Special Areas are not mutually exclusive". Resolution A.982(24), adopted on 1 December 2005, Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas.

[26] See IMO, Guidance Note on the Preparation of Proposals on Ships Routeing Systems and Ship Reporting Systems for Submission to the Sub-Committee on Safety of Navigation.

[27] Arctic Marine Shipping Assessment 2009 Report, Arctic Council, April 2009, available at: http://www.pame.is/images/stories/PDF_Files/AMSA_2009_Report_2nd_print.pdf, last visited 26 March 2012, p. 61.

[28] Barry H. Dubner, "On the Basis for the Creation of a New Method of Defining International Jurisdiction in the Arctic Ocean," *Missouri Environmental Law & Policy Review* 13, no. 1 (2005), 1–23, at 11.

[29] *Ibid.*

c) Seasonal or Permanent Closures of Areas

Not as far-reaching as the previous suggestion, an option for protection of the Arctic marine environment would be to seasonally or permanently close certain areas of the marine Arctic to fishing, exploration and resource exploitation, to protect the Arctic marine fauna that consists of few key species that tend to aggregate in large numbers. Additionally, important feeding and denning areas urgently need protection at least seasonally.

d) Common World Heritage

The designation of parts of the Arctic as World Heritage Sites under the Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention)[30] is restricted to the territories, including the territorial seas, of the five Arctic coastal states.[31]

However, those parts of the Arctic seabed that lie beyond the (extended) continental shelves of the littoral states and thus belong to the 'Area' are the common heritage of mankind under Articles 1(1), 136 UNCLOS. Activities in the Area shall be carried out for the benefit of mankind as a whole.[32] As seen above, the ISA is responsible for the organisation and control of activities in the Area, especially with regard to resource administration, but lacks a mandate for the conservation of living resources and thus for the protection of marine biodiversity in the Area. Therefore, the regime of the common heritage of mankind relates only to a limited part of the Arctic and provides only a partial mandate.

It would appear that applying the principle of common heritage of mankind in other parts of the Arctic conflicts with the established sovereignty of the Arctic littoral states over large parts of region. This is not to say, however, that the world community has no legitimate interest in the Arctic. However, rather than the principle of common heritage of mankind, the appropriate principle appears to be the "common concern of humankind" as referred to in various instruments. This principle addresses the global interest in preserving certain aspects of the environment without ascribing the status of *res communis omnium* and thus does not conflict with states' sovereignty in the relevant region.[33] The argument is therefore, that any kind of legitimate world community presence in the Arctic Ocean

[30] Convention Concerning the Protection of the World Cultural and Natural Heritage, signed 23 November 1972, entered into force 15 December 1975, 1037 UNTS 151.

[31] UNESCO, Culture, World Heritage Centre, About World Heritage, The States Parties, States to the Convention as of 10 June 2010, available at: http://whc.unesco.org/en/statesparties/; see article 3 World Heritage Convention, *supra* note 30.

[32] Article 140(1) UNCLOS.

[33] Patrizia Vigni, "The interaction between the Antarctic Treaty System and the other relevant Conventions applicable to the Antarctic area: A practical approach versus theoretical doctrines," *Max Planck yearbook of United Nations law* 4 (2000), 481–542, at 502.

acceptable to the Arctic states "would have to rest on the notion of "common concern", not common heritage; on the principle of universal responsibility, not universal entitlement".[34]

3 Miscellaneous

Suggestions for improving Arctic environmental governance within the current legal system also relate to marine spatial planning, TEAI and financial contributions from the industry benefitting from commercial exploitation of Arctic resources.

a) Marine Spatial (and Temporal) Planning: Pan Arctic EIA[35]

As noted previously, TEIA will be a crucial tool for protection of the Arctic marine environment. Assessment of impact prior to commencing activity is crucial with regard to offshore oil and gas exploitation. This was particularly clear for the Offshore Hydrocarbon Working Group of the Arctic Transform project.[36] Accordingly, it suggested inter alia to "to integrate offshore oil and gas with other activities in the area to minimise conflict through marine spatial (and temporal) planning [and to] [t]ake first steps towards a Pan Arctic EIA".[37]

b) Arctic Trust Fund

As has been highlighted in the assessment of the weaknesses of the Arctic Council, financing measures for conservation and management of the Arctic marine environment is a key issue. To ensure effectiveness of any conservation regime, a robust funding mechanism is a central element.

The Indigenous Peoples Working Group of the Arctic Transform Project proposed "that the commercial industries benefiting from Arctic resources set up an

[34] See Johnston, *supra* note 8, at 623.

[35] Offshore hydrocarbon Working Group, Arctic Transform, see http://arctic-transform.org.

[36] Arctic Transform is a project for developing "transatlantic policy options for supporting adaptation in the marine Arctic environment", see Arctic Transform website, available at: http://arctic-transform.org/index.html, last visited 8 June 2011. Arctic TRANSFORM is funded by the European Commission (DG External Relations) and is led by four institutes: Ecologic (Germany; project lead), the Arctic Centre (Finland), the Netherlands Institute for the Law of the Sea (Netherlands), and the Heinz Center (USA), see *ibid*.

[37] Cleveland and O'Carroll, "Policy Options for Arctic Environmental Governance," (Offshore Hydrocarbon Working Group, Arctic Transform, 5 March 2009), p. 2, http://arctic-transform.org/download/OffsEX.pdf (accessed June 8, 2011).

Arctic Trust Fund that will counterbalance some of the risks that their activities create. The fund could be used for adaptation activities such as relocation, training, education, etc.".[38] For the oil and gas sector in particular, where potentially large revenues might result from industrial activities, it is important that the beneficiaries of the Arctic's rich resources also share the costs of their undertakings.

Potential financial contributions from the actors based on global common good for the high seas could derive from the establishment of a "global commons trust fund"[39] or the collection of "international user fees".[40] If serving a clear goal directly linked to the accessibility of global common resources, such a "user charge system"[41] could raise awareness of the finite nature of environmental resources and create the monetary basis to ensure effective conservation.[42]

The vast and hostile marine Arctic where conservation measures are likely to be more costly than in other regions of more moderate size and climate, would make a user fee a valuable instrument to enhance environmental governance of the high seas. Such measures however, would restrict the high seas freedoms, and would therefore need to be agreed upon at the international level.

III Adopt a Cross-Sectoral Binding Agreement

As discussed above, the principal alternative to enhancing environmental governance of the marine Arctic within the current legal system is the creation of a new comprehensive legally binding agreement as proposed by various legal scholars and NGOs.[43]

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[38] Patricia Cochran and Mark Nuttall, "Policy Options for Arctic Environmental Governance: Prepared by the Indigenous Peoples Working Group," (Arctic Transform, 5 March 2009), p. 4.

[39] Proposal by Christopher D. Stone, "Mending the Seas Through a Global Commons Trust Fund," in *Freedom for the seas in the 21st century*: *ocean governance and environmental harmony*, ed. Jon M. van Dyke, Durwood Zaelke and Grant Hewison, (Washington: Island Press, 1993),171–86, at 174; see also Peter H. Sand, "Public Trusteeship for the Oceans," in *Law of the sea*, *environmental law*, *and settlement of disputes*: *Liber amicorum Judge Thomas A. Mensah*, ed. Thomas A. Mensah et al., 521–44 (Leiden, Boston: Martinus Nijhoff, 2007) 521–544, at 542.

[40] Proposal by the German Advisory Council on Global Change (Wissenschaftlicher Beirat für Globale Umweltveränderungen, WBGU) to empower international "trusteeship authorities" to levy charges for the commercial use of global common goods, such as maritime traffic on high seas, Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU), *Welt im Wandel*: *neue Strukturen globaler Umweltpolitik*., at 181. Recently, a similar measure was proposed by participants of an international ocean conference: They suggested the introduction of an international "Sea Tax" for all users that could be used to finance protection of the oceans, see the Earth Institute Columbia University, Research News, Sustainable Oceans: Reconciling Economic Use and Protection, 17 August 2011, available at: http://www.earth.columbia.edu/articles/view/2844, last visited 18 September 2011.

[41] WBGU, *supra* note 40.

[42] *Ibid*.

[43] In favour of a new and binding treaty approach, see generally Huebert and Yeager, *supra* note 17, p. 33; Samantha Smith, Time for an Arctic Convention?; World Wildlife Fund International

One of the fundamental arguments in favour of a treaty-based approach is that the regional regime with the Arctic Council, with its core of 'soft law' provisions, is inadequate because it lacks legally binding force. On the other hand, the approach of a binding legal regime has been rejected by some scholars because of the alleged disadvantages of a binding treaty as against the benefits of a soft law system.[44]

1 An Arctic Treaty Based on the Model of the Antarctic Treaty System

As for the structure of a potential Arctic Treaty, it is tempting to look to the Arctic's southern "counterpart", the Antarctic, and draw on the comprehensive Antarctic Treaty system (ATS).[45]

a) Overview of the Antarctic Treaty System (ATS)

The ATS consists of the Antarctic Treaty[46] as amended by the Environmental Protocol to the Antarctic Treaty,[47] the CCAMLR and the Convention on the Conservation of Antarctic Seals (CCAS).[48]

Arctic Programme Arctic Bulletin, March 2004, p. 3; Donald R. Rothwell, "International law and the protection of the arctic environment," *International & Comparative Law Quarterly* (1995) 280–312, at 312; *id*., "The Arctic in International Affairs: Time for a New Regime?" *The Brown Journal of World Affairs* XV, no. 1 (2008): 241–253, at 250; Melissa A. Verhaag, "It Is Not Too Late: The Need for a Comprehensive International Treaty to Protect the Arctic Environment," *Georgetown International Environmental Law Review* 15 (2002–2003) 555–580, at 578; Linda Nowlan, Arctic Legal Regime for Environmental Protection, IUCN Environmental Policy and Law Paper No. 44, 2001, IUCN, Gland, Switzerland and Cambridge, UK, in collaboration with IUCN Environmental Law Centre, Bonn, Germany, at 66.

[44] See Hoel, *supra* note 8, at 455; Young, "The Structure of Arctic Cooperation: Solving Problems/Seizing Opportunities", p. 8.

[45] Advocating a treaty modelled after the ATS Verhaag, *supra* note 43, at 578; the European Parliament also favours the ATS model: "advocating negotiations for an international treaty for the protection of the Arctic, having as its inspiration the Antarctic Treaty, as supplemented by the Madrid Protocol signed in 1991, but respecting the fundamental difference represented by the populated nature of the Arctic and the consequent rights and needs of the peoples and nations of the Arctic region; believes, however, that as a minimum starting-point such a treaty could at least cover the unpopulated and unclaimed area at the centre of the Arctic Ocean", European Parliament resolution of 9 October 2008 on Arctic governance, available at: http://www.europarl.europa.eu/sides/getDoc.do?pubRef=−//EP//TEXT+TA+20081009+ITEMS+DOC+XML+V0//EN&language=EN#sdocta1, last visited 15 February 2011.

[46] Antarctic Treaty, concluded 1 December 1959, entered into force 23 June 1961, 402 UNTS 71.

[47] Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol), concluded 4 October 1991, entered into force 14 January 1998, 30 ILM 1455.

[48] Convention for the Conservation of Antarctic Seals, concluded 1 June 1972, entered into force 11 March 1978, 11 ILM 251.

The Antarctic Treaty was originally concluded by the 12 nations conducting research in the Antarctic during the International Geophysical Year of 1957–1958, in order to peacefully continue their research.[49]

The main purpose of the Antarctic Treaty is that "in the interest of all mankind [. . .] Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord".[50] It applies to the area south of 60° South.[51] Due to partial overlaps between territorial claims of the Treaty Parties with regard to the Treaty Area, the *status quo* of the claims at the time of the conclusion of the Treaty has been preserved by Article IV, which stipulates that any territorial claim made remains unaffected by the Antarctic Treaty and that while the Treaty is in force, no new claims shall be asserted.

Originally, the ATS was not designed for environmental protection in the Antarctic, but by the time the Madrid Protocol[52] entered into force in 1998, the focus had almost completely shifted.[53] Through the Protocol, Antarctica was designated "as a natural reserve, devoted to peace and science".[54]

Although it is not explained what is meant by the designation as "natural reserve" it seems clear that the chosen terminology places an increased responsibility on the state parties to protect the Antarctic environment.[55] Article 3 of the Protocol establishes several environmental principles for the conduct of all activities in the area.[56] These principles include the duty to plan and conduct activities so as to limit detrimental effects on the Antarctic environment and dependent and associated ecosystems, to base these activities on prior assessments of their potential impact on the environment and to regularly and effectively monitor on-going

[49] Harlan K. Cohen, Handbook of the Antarctic Treaty System, US Department of State Ninth Edition, July 2002, available at: http://www.state.gov/g/oes/rls/rpts/ant/, last visited 30 May 2011; today, the Antarctic Treaty has 48 parties, of which 28 have consultative status on the basis of being original signatories or by conducting substantial research there, and thus have the right to participate in the annual Antarctic Treaty Consultative Meetings (ATCM). The remaining twenty parties have non-Consultative status, see Secretariat of the Antarctic Treaty, Antarctic Treaty, Parties, available at: http://www.ats.aq/devAS/ats_parties.aspx?lang=e, last visited 21 May 2011; article IX(2) Antarctic Treaty.

[50] Preamble to the Antarctic Treaty.

[51] Article VI Antarctic Treaty.

[52] Protocol on Environmental Protection to the Antarctic Treaty, concluded 4 October 1991, entered into force 14 January 1998, 30 ILM 1455 (1991).

[53] See Nowlan, *supra* note 43, p. 41.

[54] Article 2 Madrid Protocol.

[55] See Donald Rothwell, *The polar regions and the development of international law*, 1. publ., Cambridge studies in international and comparative law: New series; 3 (Cambridge: Cambridge University Press, 1996), p. 380.

[56] Article 3(1) Madrid Protocol states: "The protection of the Antarctic environment and dependent and associated ecosystems and the intrinsic value of Antarctica, including its wilderness and aesthetic values and its value as an area for the conduct of scientific research, in particular research essential to understanding the global environment, shall be fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area."

activities to assess their impacts. Furthermore, the Madrid Protocol contains a provision on cooperation between the states parties and an Article on EIA.[57] Any activity relating to mineral resources except for scientific study is completely prohibited.[58] The Protocol is complemented by six Annexes on EIA, Fauna and Flora, Waste Disposal, Marine Pollution, Protected Areas and Liability. Since all human activities in the treaty area are covered by the Protocol, it embodies a comprehensive approach stipulating uniform standards in a single instrument.[59]

b) Comparison Between the Two Poles

However, it has to be kept in mind that the Arctic and Antarctic are "poles apart"[60] in more than mere geography[61]: Firstly, the Arctic is a frozen sea surrounded by land whereas the Antarctic is a continent that is surrounded by sea; therefore, the law of the sea that is the primary governance tool in the Arctic does not play as important a role in the Antarctic. Secondly, the Arctic Region has been settled by native human population for centuries; the Antarctic, in contrast, serves only for transient human habitation (mainly scientists, also tourists; but no indigenous population).

Thus, governance needs are profoundly different in both regions. A potential Arctic Treaty has to take into account the needs of the Arctic inhabitants. The Arctic environment could not be designated as a natural reserve like Antarctica without providing for sustainable use of its resources. Furthermore, any regulation for protection and preservation of the Arctic environment has to be accepted by the Arctic states that will not easily put aside their economic interests. Thirdly, while the Antarctic has been designated as a non-militarized zone,[62] the Arctic has been a highly strategic, militarized territory, with the associated environmental pollution

[57] See Articles 6 and 8 Madrid Protocol.

[58] See Article 7 Madrid Protocol; originally, it was envisaged to regulate mining activities by the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA), 2 June 1988. However, based upon concerns about the environmental impacts of mineral exploitation, many states eventually did not sign the Convention, so that it has not entered into force. The total prohibition of mining in the Madrid Protocol will remain in force until replaced by a legally binding regime regulating the issue, see Nowlan, *supra* note 43, p. 46.

[59] See S. K. N. Blay, "New Trends in the Protection of the Antarctic Environment: The 1991 Madrid Protocol". *The American Journal of International Law* Vol. 86, No. 2 (Apr., 1992), 377–399, at 385.

[60] See Thomas Blunden, "The legal status of the Arctic under contemporary international law: An Antarctic regime or poles apart?" *The journal of international maritime law* 15, no. 3 (2009), at 249.

[61] See Ron Macnab, "The Southern and Arctic Oceans: Polar Opposites in Many Respects," in *The Yearbook of Polar Law*, ed. Gudmundur Alfredsson and Timo Koivurova, 245–51 2 (Leiden Boston: Martinus Nijhoff Publishers, 2010), at 247.

[62] The Antarctic Treaty stipulates that "Antarctica shall be used for peaceful purposes only" (Article I). To this end it prohibits "any measures of a military nature" but does "not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose".

resulting from military activities. Furthermore, strategic considerations might also have to be taken into account when drafting a future Arctic Treaty.

Most significantly, while much of the Arctic lies under the sovereignty and sovereign rights of Arctic States, sovereignty claims in the Antarctic have been frozen.[63]

These differences seem to render comparisons of legal regimes useless, a view adopted and echoed by many scholars.[64] However, with regard to environmental protection, it might well be argued that the vulnerability of the polar ecosystems make a comparative study of the different regimes worthwhile. Both the Arctic and the Antarctic have substantial stocks of marine living resources, which are alike in that they are highly concentrated to a few key species. This results in a high degree of vulnerability that is unique to the polar regions.[65]

In addition to the unique flora and fauna and the fragility of the environment, the two polar regions obviously also share extreme climatic conditions and both are particularly susceptible—though to varying degrees—to the effects of global climate change.[66]

As stated, the disparities between the two polar regions rule out a simple replication of the ATS. Having said that, the similarities between the polar regions indicate that certain elements of the ATS may be applied successfully in the Arctic and improve the existing environmental protection regime. In other words, the way the ATS handles the protection of the Antarctic environment might very well provide valuable inspiration for a possible Arctic Treaty.[67]

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[63] Timo Koivurova, "Environmental protection in the Arctic and Antarctic: Can the polar regimes learn from each other?", *International Journal of Legal Information* 33, no. 2 (2005) 204–218, at 211.

[64] See Oran R. Young, ""Arctic waters": The politics of regime formation," *Ocean Development & International Law* 18, no. 1 (1987), 101–114, at 102; Gail Osherenko and Oran R. Young, *The age of the Arctic*: *Hot conflicts and cold realities* (Cambridge [England], New York: Cambridge University Press, 1989), pp. 242–244; Franckx, Maritime claims in the Arctic: Canadian and Russian perspectives (Dordrecht: Nijhoff, 1993), pp. 6–8.

[65] Stuart B. Kaye, "Legal approaches to Polar fisheries regimes: A comparative analysis of the Convention for the Conservation of Antarctic Marine Living Resources and the Bering Sea Doughnut Hole Convention," *California Western International Law Journal* 26, no. 1 (1995) 75–114, at 78.

[66] See Stephen A. Macko, "Changes in the Arctic Environment," in *Changes in the Arctic environment and the law of the sea*, *supra* note 23, 107–29, at 116 *et seq*.

[67] Sands, *supra* note 20, at 731; Johnston, *supra* note 8, at 622; Donald R. Rothwell, "Polar Lessons for an Arctic Regime," *Cooperation and Conflict* 29 (1994) 55–76, at 56; Timo Koivurova, "Alternatives for an Arctic treaty: Evaluation and a new proposal," *Review of European Community & International Environmental Law* 17, no. 1 (2008), 14–26, at 17; recently, the value of sharing know-how and experience among the ATS and Arctic Council Members has been recognized. At the first ever joint meeting of the Arctic Council and the Antarctic Treaty Consultative Meeting (ATCM) held in Washington in April 2009, "the development of coordinated research and scientific observations at both poles to compare the current dynamics of polar areas and their contributions to the Earth's processes and changes" was encouraged, see Antarctic Treaty-Arctic Council Joint Meeting Washington Ministerial Declaration on the International

It appears that the two polar regimes have adopted quite different approaches to addressing the issue of environmental protection.[68] The lack of sovereign territory in Antarctica due to the "freezing" of sovereignty claims, has allowed environmental protection to be managed by international law from the beginning.[69] In contrast, environmental regulation in the Arctic was originally solely subject to domestic law of the riparian states. When cooperation between these states began, they opted for an informal, soft-law approach to coordinate and improve environmental protection whereas the parties to the ATS chose to create legally binding hard-law.

These differences aside, an Arctic Treaty may take the scope, focus and structure of the ATS.[70] The structure of the ATS in particular, with the main Treaty complemented by specific protocols with annexes provides a model of a binding Treaty with enforceable provisions that also allows for flexibility to adapt new situations or knowledge.

Furthermore, the anticipatory approach adopted by the ATS should be included into a potential Arctic Treaty.[71] The Madrid Protocol, the CCAMLR and the designation of PSSAs could serve as templates for inclusion in a potential Arctic Treaty. These elements should not be duplicated, but inspired by the ATS.[72]

The integrated ecosystem based approach of the Madrid Protocol may be of some use in overcoming the fragmented and sectoral governance of environmental protection in the Arctic. This would provide an ATS orientation, ameliorating the difficulties highlighted above caused by the lack of comprehensive instrument like CCAMLR in the Arctic to deal with the whole marine ecosystem, or even region-wide for one single species.[73]

Polar Year and Polar Science, Communique, Bureau of Oceans and International Environmental and Scientific Affairs, Washington DC, 6 April 2009, available at: http://www.state.gov/g/oes/rls/other/2009/121340.htm, last visited 21 May 2011; also see Hillary Rodham Clinton, Remarks at the Joint Session of the ATCM and the Arctic Council, 50th Anniversary of the Antarctic Treaty, Washington DC, 6 April 2009, available at: www.state.gov/secretary/rm/2009a/04/121314.htm, last visited 21 May 2011.

[68] Koivurova, *supra* note 63, at 211.

[69] *Ibid*., at 213.

[70] See Bonnie A. Malloy, "On Thin Ice: How a Binding Treaty Regime Can Save the Arctic," *Hastings West-Northwest Journal of Environmental Law and Policy* 16 (2010) 471–511, at 495.

[71] Rothwell, *supra* note 67, at 64.

[72] Paul A. Berkman, "Integrated Arctic Ocean Governance for the Lasting Benefit of All Humanity," in New Chances and New Responsibilities in the Arctic Region, *supra* note 13, 187–94, at 194.

[73] Kaye, *supra* note 65, at 97.

2 Framework Convention and Subsequent Protocols

Even if not following the content of the Antarctic Treaty, a potential Arctic Treaty could still adopt the Treaty's form. The gradual introduction of complementary agreements on priority issues since 1959, such as the conservation of seals or marine living resources, has led to the term the "incremental treaty system approach".[74] However, in the Arctic, many of these issues have to be addressed urgently and there is no time to wait for 20 or even 30 years to address the relevant concerns in additional agreements.

This is not to say that a possible Arctic Treaty should not follow the approach of a framework convention with subsequent protocols.[75] The term 'framework convention' refers to a type of treaty providing a framework for later, more detailed treaties, which are generally called protocols.[76] It is the most common approach adopted for marine environmental treaties, for example in the case of the *Barcelona Convention*[77] for the Mediterranean Sea.[78] While the Convention sets out the basic obligations and powers of the parties concerning different sources of pollution and institutional aspects, implementation is achieved via the specific protocols dealing *inter alia* with pollution from land-based sources and dumping. A framework agreement bears the advantage that it allows negotiating parties to agree to the most important terms on the agenda while leaving technical details for subsequent implementation in annexes or protocols that could be made compulsory.[79] On the other hand, it does include the risk that contentious details are left for later negotiations thus drawing out the process of developing important regulation.

3 Regional Seas Agreement

The Barcelona Convention represents not only an example of a framework convention, but also of a regional seas agreement administered by the regional seas programme under the United Nations Environment Programme (UNEP). This

[74] David L. VanderZwaag, "Climate Change and the Future of Arctic Governance: A Slushy Seascape and Hard Questions." In *Climate governance in the Arctic*. Edited by Timo Koivurova, E. C. Keskitalo and Nigel Bankes. 1. Ed., 403–28. Dordrecht: Springer Netherland, 2009, at 417.

[75] Rothwell, *supra* note 14, at 308; *id*., *supra* note 43, at 250; Koivurova, *supra* note 67, at 15.

[76] Anthony Aust, *Modern treaty law and practice*, 2nd ed. (Cambridge: Cambridge University Press, 2007), p. 122.

[77] Convention for the Protection of the Mediterranean Sea against Pollution, signed 16 February 1976, entered into force 2 December 1978, 1102 UNTS 27.

[78] VanderZwaag, *supra* note 74, at 416 *et seq*.

[79] Hans H. Hertell, "Arctic Melt: the Tipping Point for an Arctic Treaty," *The Georgetown International Environmental Law Review* 21, no. 3 (2009), at 587.

categorisation does not relate, however, to a specific form of treaty but to the circle of participating states, namely those bordering shared water.[80]

Regional seas agreements and/or action plans have been set up under the auspices of UNEP to implement Part XII UNCLOS at the regional level.[81] In fact, Part XII UNCLOS not only "expressly recognised [but], indeed, mandated regional approaches".[82] In case of the Arctic, the regional approach is arguably also encouraged by Article 123 UNCLOS on semi-enclosed seas.

Regionalism, i.e. "cooperation of States of a certain region in order to resolve the particular environmental problems of a geographical area"[83] has been advocated as a very effective approach to protect and preserve the marine environment.[84] It offers the advantages of being able to take regional peculiarities into account, benefiting from the common interests that neighbouring states generally share and limiting the number of participants to facilitate agreements being reached. As the Arctic marine environment has various unique characteristics that add to its vulnerability, the aspect of region-specific regulations is particularly important.

A potential Arctic Treaty could be guided by the UNEP Regional Seas Programme model with a framework regional seas action plan and convention with subsequent protocols, following the example of the Barcelona Convention.[85]

The extension of the geographic scope of the OSPAR Convention, as a regional seas agreement that already applies to parts of the marine Arctic, may be worth considering.[86] Certainly, the Convention itself deals with the possibility of amending the conventional area. In case of accession to the Convention, the "definition of the maritime area shall, if necessary, be amended by a decision of

[80] The group of participating states might, however, be extended to include non-coastal states, see e.g. article 27(2) Barcelona Convention, *supra* note 77.

[81] Currently, over 143 countries participate in 13 Regional Seas programmes that were established under the auspices of UNEP: Black Sea, Wider Caribbean, East Asian Seas, Eastern Africa, South Asian Seas, ROPME Sea Area, Mediterranean, North-East Pacific, Northwest Pacific, Red Sea and Gulf of Aden, South-East Pacific, Pacific, and Western Africa, see UNEP, Regional Seas Programme, available at: http://www.unep.org/regionalseas/about/default.asp, last visited 19 September 2011.

[82] United Nations, Law of the Sea: Protection and Preservation of the Marine Environment, Report of the Secretary-General (U.N. Doc. A/44/461), September 18, 1989.

[83] Rainer Lagoni, "Regional Protection of the Marine Environment in the Northeast Atlantic Under the OSPAR Convention of 1992," in *The Stockholm declaration and law of the marine environment*, ed. Myron H. Nordquist, John N. Moore and Said Mahmoudi, 183–204 (The Hague; New York: Kluwer Law International, 2003), at 197.

[84] See UN General Assembly, Report on the work of the United Nations Open-ended Informal Consultative Process established by the General Assembly in its resolution 54/33 in order to facilitate the annual review by the Assembly of developments in ocean affairs at its third meeting, 2 July 2002, UN Doc. A/57/80.

[85] David VanderZwaag, "International law and Arctic marine conservation and protection: A slushy, shifting seascape," *Georgetown International Environmental Law Review* 9, no. 2 (1997) 303–345, 340 *et seq*.

[86] See Koivurova, Molenaar and VanderZwaag, *supra* note 15, at 283.

the Commission".[87] Canada and the United States could accede to the OSPAR Convention on invitation from its contracting parties as provided for in Article 27 (2) OSPAR Convention, Russia as a coastal state to the OSPAR Maritime Area has a right to accession without invitation pursuant to Articles 27(1), 25 OSPAR Convention. A pursuant amendment of the Maritime Area's definition would follow the procedure laid out in Article 27(2) OSPAR Convention. There seem to be no hindrances even to a large spatial adjustment that would lead to the inclusion of the complete Arctic Ocean.[88] However, the political will may be lacking among the named states to accede to the OSPAR Convention, which creates comprehensive and legally binding duties to protect the environment—Russia has been repeatedly invited to join the Convention but thus far shows no signs of doing so.

Another proposal is the creation of a new regional seas agreement for the Arctic,[89] which allows the inclusion of fisheries issues into the scope of management.[90] Some authors propose that the regional agreement be built upon existing structures of the Arctic Council, including an integration of its Working Groups.[91] However, as discussed above, it is highly unlikely that the Arctic Council will formalise its structure and transform itself into a treaty-based organisation, as its members have repeatedly expressed their opposition to this idea. Likewise, the inclusion of fisheries management has been rejected by the Council.

However, a key success factor for sustainable management and conservation of the Arctic marine environment would be a comprehensive, trans-sectoral regional seas agreement. Were a fisheries conservation and management mandate to be included into the OSPAR Convention or something similar to it, a regional seas agreement could represent a valuable instrument for integrated, ecosystem-based management of the marine Arctic.[92]

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[87] Article 27(2) OSPAR Convention.

[88] Since the full spatial overlap of the OSPAR Maritime Area with the spatial scope of the NEAFC Convention represents a potential basis for integrated, cross-sectoral ecosystem-based ocean management, the OSPAR Convention should seek to follow a possible extension of NEAFC's Conventional Area and *vice versa*, Timo Koivurova and Erik J. Molenaar, "International Governance and Regulation of the Marine Arctic: Options for Addressing Identified Gaps," (January 2009), available at: http://img9.custompublish.com/getfile.php/1092818.1529.fewsuutsbp/Options+for+Addressing+IdentifiedGaps_0306.pdf?return=www.arcticgovernance.org, last visited 12 March 2012, p. 15.

[89] Rothwell, *supra* note 43, at 307 *et seqq*.; *id*., *supra* note 43, at 250; Louise A. de La Fayette, "Oceans Governance in the Arctic," *International Journal of Marine and Coastal Law* 23 (2008), 531–566, at 563.

[90] Kathryn Isted, "Sovereignty in the Arctic: An Analysis of Territorial Disputes & Environmental Policy Considerations," *Journal of Transnational Law & Policy* 18 (2008–2009), 343–376, at 376; see de La Fayette, *supra* note 89, at 558.

[91] *Ibid*., at 563; Isted suggests that the existing Working Groups be completed by a Working Group for Fisheries that would set up a fisheries management plan for the whole region, Isted, *supra* note 90, at 376.

[92] See de La Fayette, *supra* note 89, at 564.

A disadvantage of a purely regional approach is, however, the lack of participation from other countries that might be active in the region and affect the marine environment, e.g. long-distance shipping nations.[93]

4 Implementing Agreement Under UNCLOS

That lack of participation could be avoided by creating an Implementing Agreement under UNCLOS.

The Executive Director of the European Environment Agency, Professor *Jacqueline McGlade*, proposed an UNCLOS protocol for the Polar Ocean, to address new shipping routes, new fishing grounds and oil and gas exploration.[94] Also, joint mapping, research and monitoring, establishing a state of the environment baseline, protected areas, common standards for petroleum extraction and moratoria on destructive fishing practices should be addressed.[95] Although the use of the term "Polar Ocean Protocol" suggests application to both polar regions, the context indicates it is limited to the Arctic.

As Part XI Deep-Sea Mining Agreement and the FSA show, Implementing Agreements under UNCLOS are feasible. However, so far there is no such Implementing Agreement with a regional focus.[96] This is not to say that a corresponding agreement would be excluded by UNCLOS or other provisions of international law.

Despite this, the conclusion of an Implementing Agreement to UNCLOS for the governance and regulation of the Arctic marine environment is very unrealistic.[97] The negotiation process would fall under UNGA and be accordingly determined by its rules of procedure. The global nature of both UNGA and UNCLOS, effectively rules out limiting the negotiation process to a few states, extending instead to all UN Members.[98] Yet, it is nearly "unthinkable"[99] that the Arctic states would agree to negotiate an Arctic Treaty with more than 180 different nations with various and partially conflicting views and interests. The Arctic littoral nations in particular

[93] But cf. Hertell, *supra* note 79, at 586 *et seq*.: "An exclusive gathering of the Arctic nations with common purposes will yield better results in terms of the adoption of legal instruments tailored to the Arctic's unique ecological conditions than would negotiations involving nations outside of the Arctic area."

[94] Jacqueline McGlade, The Arctic Environment – Why Europe should care, Speech by Professor Jacqueline McGlade at Arctic Frontiers Conference, Tromsø, 23 January 2007.

[95] *Ibid*.

[96] Koivurova, Molenaar and VanderZwaag, *supra* note 15, at 285.

[97] In general on the low probability of an international Arctic Treaty see Rosemary Rayfuse, "Melting moments: The future of polar oceans governance in a warming world," *Review of European Community & International Environmental Law* 16, no. 2 (2007) 196–216, at 214.

[98] Koivurova, Molenaar and VanderZwaag, *supra* note 15, at 285.

[99] *Ibid*.

would fear losing or limiting their rights and interests as coastal states. These difficulties make an Implementing Agreement to UNCLOS pertaining to the marine Arctic an unrealistic option.

5 Regime for the ABNJ

As mentioned earlier, the region that is probably most under pressure is the Arctic marine ABNJ.[100] There is a range of approaches for managing these areas.[101]

a) Law of the Sea

The first would be to apply the Law of the Sea in both its conventional and its customary forms. However, analysis of the international regime for ABNJ has revealed its frailties, legal and institutional fragmentation, unregulated activities and deficient compliance and enforcement, to name only a few. Consequently, reliance on the global regime would not ensure adequate conservation of the Arctic marine environment in ABNJ.

b) Sui Generis Approach

A second option involves the adoption of a regional *sui generis* approach. There are two potential options here[102]: The first alternative is that the five coastal states divide the area into national segments that would be managed independently by each nation.[103]

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[100] The enclosed high seas area of the central Arctic Ocean has been described as the 'Arctic Mediterranean', Bo Johnson Theutenberg, "The Arctic Law of the Sea," *Nordic Journal of International Law* 52 (1983), 3–39, at 3.

[101] However, as VanderZwaag noted, "governance of the Arctic Ocean beyond national jurisdiction has not been in the centre of attention of academics addressing Arctic issues", see Presentation by *id*., Marine & Environmental Law Institute Dalhousie University, Sustainable Use of Natural Resources and Conservation of Biodiversity in the Arctic: The Legal Challenges, Longyearbyen, Svalbard, March 29, 2007.

[102] See Presentation by David VanderZwaag, Marine & Environmental Law Institute Dalhousie University, Sustainable Use of Natural Resources and Conservation of Biodiversity in the Arctic: The Legal Challenges, Longyearbyen, Svalbard, March 29, 2007.

[103] Canada has occasionally doubted the status of the Arctic Ocean as high seas, see Donat Pharand, "The legal status of the arctic regions," *Recueil des cours/Académie de Droit International de La Haye* 163, no. 2 (1979), 53–115; some Russian and Soviet authors share the view that there exists no high seas area in the Arctic, see Alexander N. Vylegzhanin, "Developing International Law Teachings for Preventing Inter-State Disaccords in the Arctic Ocean," in *New Chances and New Responsibilities in the Arctic Region*, *supra* note 13, 209–222, at 218; Rothwell suggested

The second option is negotiated cooperative management arrangements between the coastal states. These could include, for instance, an agreement not to allow commercial fishery developments or to establish a Regional Ocean Management Organisation to govern ocean ABNJ.[104]

Yet, neither option provides a complete solution: A division of the centre of the Arctic Ocean between the littoral states has received very little support from states or scholars. This is for two reasons: Firstly, dividing the Arctic Ocean among the littoral states limits potential application of the urgently needed ecosystem approach. Secondly, the exclusion of all non-Arctic states is likely to arouse objections about this "Arctic Club".[105]

The latter argument also applies to the second approach. Non-Arctic states interested in the use of the central Arctic Ocean would certainly object for good reasons if the Arctic states unilaterally excluded them from exercising their freedom of the high seas.

c) Multilateral Arctic Ocean Agreement

Another possible option would be a multilateral agreement approach that would be open to all interested states and include the high seas.

At first glance, it seems quite unlikely that the Arctic States would be willing to conclude such an agreement with non-Arctic States. As they have expressed various times[106] they do not wish interference by other interested states and seek to maintain dominance in the region.

However, the melting sea ice on the central Arctic Ocean will in the not too distant future enable access to high seas areas, which will be open to all states, not just the Arctic (coastal) states.[107] The prospect of non-Arctic states accessing the areas and particularly the resources beyond national jurisdiction in the marine Arctic could motivate the Arctic states to consider a multilateral agreement approach.

However, the willingness of Arctic coastal states to restrict mineral exploration and exploitation on their extended continental shelves is not certain. Effective

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that the special situation of the Arctic Ocean may provide grounds for the Arctic Five to claim jurisdiction over the high seas beyond national maritime zones. However, the relevant argumentation was based on the notion that the permanently ice-covered Arctic high seas did not really allow for exercise of high seas freedoms and thus do not fit into the traditional high seas freedoms. The rapidly diminishing sea ice considerably weakens this argument, Rothwell, *supra* note 43, at 291. A great majority of legal scholars and policymakers find that the Arctic waters beyond national jurisdiction no different from high seas in other parts of the world, see Vylegzhanin, *ibid*.

[104] Rayfuse, *supra* note 97, at 215; *id*., "Protecting Marine Biodiversity in Polar Areas Beyond National Jurisdiction," *Review of European Community & International Environmental Law* 17, no. 1 (2008) 3–13, at 10.

[105] VanderZwaag, *supra* note 74, at 419.

[106] Especially in the Ilulissat Declaration, *supra* note 7.

[107] See Article 87(1) UNCLOS.

protection of the marine ABNJ requires that measures for conservation of the living resources on the extended continental shelves and protective measures with regard to the overlying high seas water column be harmonised. The same is true for the conservation of ecosystems in the Area.

It has also been proposed that the high Arctic Ocean be maintained as an MPA, possibly open to a few uses, such as tourism and scientific marine research.[108] Apart from the legal issues connected to high seas MPAs, it should generally be kept in mind that a reform limited to ABNJ would not be the optimum solution for enhancing Arctic environmental governance. In fact, such a limited approach "would place coastal states in a more advantageous position, vis-à-vis other states, due to lower costs/higher profits of transboundary effects".[109] To achieve integrated, ecosystem-based management mandates an approach that includes the whole Arctic marine area, within and beyond national jurisdictions.

6 Parties to a Potential Arctic Treaty

The question of participation has to be answered for any type of treaty. Should the protection of the Arctic environment be the prerogative of the Arctic states? Or should it be the responsibility of the larger international community?

a) Stewardship Role of the Arctic (Coastal) States?

In the oft-cited Ilulissat Declaration, the Arctic littoral states claimed "a stewardship role in protecting"[110] the Arctic environment, although the meaning ascribed to this concept by the drafters of the Declaration has not been elaborated upon.

Although the Arctic coastal states have not expressly declared it, the Ilulissat Declaration has been understood as an assertion of their stewardship role not only regarding waters under their jurisdiction, but also concerning the high seas areas of the central Arctic Ocean.[111]

With regard to the legal basis of their claim, the Arctic littoral states seem to rely on their jurisdiction as coastal states, especially as regards ice-covered waters according to Article 234 UNCLOS. This provision does not, however, relate to the protection of (ice-covered) high seas areas. Since access to the central Arctic high seas area is only possible via the EEZ of the Arctic coastal states, however, the

[108] See Presentation by VanderZwaag, *supra* note 102.

[109] Koivurova, Molenaar and VanderZwaag, *supra* note 15, at 273.

[110] Ilulissat Declaration, *supra* note 7.

[111] See Rosemary Rayfuse, "Warm Waters and Cold Shoulders: Jostling for Jurisdiction in Polar Oceans," in *The Yearbook of Polar Law*, ed. Gudmundur Alfredsson and Timo Koivurova, 465–76 1 (Leiden Boston: Martinus Nijhoff Publishers, 2009), at 468.

national regulations adopted pursuant to Article 234 UNCLOS also become relevant for vessels planning to navigate in the Arctic Ocean high seas. Whereas the weight of opinion negates the qualification of the Arctic Ocean as semi-enclosed sea, one author has also argued that "[i]f the five littoral states were to acknowledge their common responsibilities based on [Article 123 UNCLOS], it would certainly strengthen their claim to exclusive entitlements beyond 200-m limits in the Arctic Ocean [. . .] vis-à-vis the rest of the international community".[112]

The Arctic States must also consider their function as trustees for the conservation and preservation of the Arctic Ocean's marine environment and the conservation and sustainable use of its resources. In general, the doctrine of "public trust" implies that certain natural resources are defined as part of an "inalienable public trust", certain authorities are designated as "public trustees" to guard them, and every citizen may hold the trustees accountable.[113]

Yet, it is highly unlikely that others are willing to accept the role of the Arctic coastal states as stewards who are "deputised by the international community to look after Arctic issues in the interests of all".[114] Powerful nations such as China, non-state actors like the WWF or state associations like the European Union have expressed objections to such an approach.[115]

b) Legitimate Interests of the World Community?

In fact, under the international legal regime governing the marine Arctic, the international community has legitimate rights and interests concerning the region as well as the coastal states.[116] As noted, extra-regional states have rights to use the Arctic Ocean, e.g. for navigation, resource exploitation or scientific research that have to be taken into account by the Arctic nations. Accordingly, for successful management of the marine Arctic, the Arctic coastal states need the support and participation of other states and international organisations such as the IMO. International involvement is particularly significant on the high seas where flag

[112] Johnston, *supra* note 8, at 600.

[113] Peter H. Sand, *supra* note 39, at 521; the Mediterranean regional seas programme established by UNEP in 1976 has been described as an existing (treaty-based) public trust regime, see Evangelos Raftopoulos, "The Barcelona Convention System for the Protection of the Mediterranean Sea against Pollution: An International Trust at Work," *International Journal of Estuarine and Coastal Law* 7, no. 1 (1992) 27–42, at 29.

[114] Young, *supra* note 7, at 180.

[115] *Ibid.*

[116] See Brooks B. Yeager, "Managing Towards Sustainability in the Arctic: Some Practical Considerations," in *New Chances and New Responsibilities in the Arctic Region*: *Papers from the International Conference at the German Federal Foreign Office in cooperation with the Ministries of Foreign Affairs of Denmark and Norway*, *11–13 March 2009*, *Berlin*, ed. Georg Witschel et al., 567–78 (Berlin: Berliner Wissenschafts-Verlag), at 577.

state jurisdiction is dominant. Any potential Arctic Treaty should thus include interested extra-regional states.

The fact that many threats to the Arctic are actually generated outside the region is also a compelling argument for broad participation in a potential Arctic Treaty.[117] With regard to these transboundary and transregional issues, "a strictly limited regional approach"[118] is not a sound solution.

Another argument for the participation of non-Arctic states in an Arctic Regime is the crucial role the Arctic plays in the global climate system. As previously stated, changes in the Arctic environment can have worldwide repercussions and thus the world community has a vital interest in the conservation of the region.[119]

The Arctic states will probably remain very reluctant to concede power to other interested states. Yet, a failure to acknowledge the interests of the international community, and accept collective responsibility to negotiate a special regional regime for the Arctic Ocean may see the international community taking steps to fill any vacuum that might develop.

7 Impediments for the Development of a Comprehensive Legal Regime for Protection of the Arctic Marine Environment

a) Lack of Political Will

As the Ilulissat Declaration demonstrated for the Arctic coastal states, and the 'Arctic Eight' in the Arctic Council subsequently supported and recently confirmed, the prime impediment for a binding legal regime for protection of the Arctic marine environment is the lack of political will among the Arctic States.[120] Currently, there are no signs that these countries might change their minds and support a legally binding approach.[121]

At least in the near term, the Arctic states will continue to favour a sectoral and issue-by-issue approach to enhance Arctic environmental governance,[122] as they

[117] This applies e.g. to climate change and to long-range transboundary pollutants, see Verhaag, *supra* note 43, at 578.

[118] Alexei Y. Roginko and Matthew J. LaMourie, "Emerging marine environmental protection strategies for the Arctic," *Marine Policy* (1992) 259–276, at 266.

[119] *Ibid.*

[120] See the criteria recently set out for potential observers to the Arctic Council: they must "[r]ecognize that an extensive legal framework applies to the Arctic Ocean including, notably, the Law of the Sea, and that this framework provides a solid foundation for responsible management of this ocean." Senior Arctic Officials (SAO) Report to Ministers, Nuuk, Greenland, May 2011, p. 50, available at: http://arctic-council.org/filearchive/nuuk_SAO_report.pdf, last visited 10 August 2011.

[121] See Koivurova, Molenaar and VanderZwaag, *supra* note 15, at 266.

[122] Koivurova, Molenaar and VanderZwaag, *supra* note 15, at 275.

have recently demonstrated with the conclusion of the Arctic Search and Rescue Agreement.

Yet, as *Koivurova* and *VanderZwaag* noted, "[c]limate change combined with increasing accessibility of natural resources in the Arctic hold the potential to become tipping points that could result in the adoption of a legally binding approach."[123]

b) Fragmentation

Apart from the lack of political will, a further impediment for a comprehensive, legally binding regime for the marine Arctic exists in the level of legal and institutional fragmentation. The analysis of the regional regimes and the institutional framework for (high seas) fisheries in the Arctic showed there are numerous bodies responsible for different activities and/or various spatial segments of the region, whose responsibilities partially overlap and compete. In addition, numerous global, regional and sub-regional agreements either explicitly or implicitly address aspects of regulation of the marine Arctic. The challenge is to identify a leading body that is willing and capable of stepping up to lead negotiations on an integrated binding regime and to align the differing responsibilities of states under their multitudinous agreements.

c) Disputes About Maritime Boundaries

In addition, a region-wide Arctic Treaty could be hampered by disputes about maritime boundaries among Arctic states. Any regional agreement would have to take into account the stakeholders' interest in ensuring that the conclusion of the agreement would not alter their claims. A potential solution to this issue could be taken from the ATS where competing claims have been "frozen" for the period the Treaty System is in force.

IV Conclusion

The present assessment of the legal regime for the Arctic marine environment has shown that the region is subject to manifold threats, above all the massive alterations resulting from climate change. The area is, and continues to be, heavily influenced by global warming, while the ability of its ecosystems to respond to these changes is limited by their specialisation. Compounding this, the unique

[123] Timo Koivurova and David VanderZwaag, "The Arctic Council at 10 years: Retrospect and prospects," *University of British Columbia law review* 40, no. 1 (2007), 121–195, at 180.

Arctic conditions multiply the threats of ocean uses, for instance with regard to the effects of oil pollution, exacerbating the substantial pre-pollution in the region.

As human activities increase and expand further into the north, these threats will amplify. This research has revealed that the current legal regime is not sufficiently equipped, neither at a regional nor at a global scale, to ensure sustainable management and conservation of the marine Arctic in light of these projected changes.

At the regional level, the Arctic Council as main forum for intergovernmental consultation among the Arctic states suffers from various shortcomings, first and foremost being its lack of authority to create legally binding obligations, but also from insufficient division of labour with other regional bodies. While the Council deserves appreciation not only for drawing attention to Arctic environmental issues, but above all for scientifically assessing these matters in a transboundary manner, it falls short of providing the means to successfully tackle the identified environmental hazards. Problem identification and analysis is not followed by enforceable obligations for remedy, but relies on the voluntary commitment of the Arctic states. Apart from that, the pursuit and achievement of long-term goals is hampered by the shifting chairmanship that often goes hand-in-hand with alternating priorities. Furthermore, the effectiveness of the Council's work is weakened by its incomprehensive scope excluding fisheries issues and the lack of an integrated approach due to the division of labour between its Working Groups. All in all, the Arctic Council is far from providing appropriate solutions for the challenges the threatened and fragile Arctic marine environment is facing.

Concerning the global framework, the lack of provisions that take into account the special Arctic circumstances is a main issue. In addition, management and conservation of the Arctic marine environment will face the shortcomings prevailing in the international regime, such as legal and institutional fragmentation and the resulting deficits in implementation of an integrated, cross-sectoral and ecosystem-based approach; the shortcomings relating to the establishment of a representative network of MPAs, including on the high seas; or unregulated activities on the high seas.

UNCLOS as the basic legal framework regulating all human activities on the seas and oceans and providing the basis for the protection of the marine environment is applicable to the whole globe and thus naturally not tailor-made for the Arctic Region. Apart from article 234, UNCLOS contains no specific provisions for the polar marine regions. Consequently, it cannot take into account the particular frailty and necessities of the Arctic marine environment.

Apart from that, regarding marine environmental protection, UNCLOS provisions set only a minimum that is by no means sufficient to safeguard adequate protection of the Arctic marine environment in light of the indicated hazards that exist and will be aggravated by the consequences of climate change. Not only the peculiar environmental conditions in the region that e.g. hamper the degradation of pollutants, but also the manifold threats resulting from intensified human activities, mandate a stricter approach to the prevention of pollution.

Besides UNCLOS, a variety of international agreements is applicable to the Arctic marine environment. These can be grouped into three categories: treaties

regulating certain geographic areas of the marine Arctic (e.g. the OSPAR Convention), concerning single species (e.g. the Polar Bear Agreement) or regarding specific sectors of human activities (e.g. the Polar Code for ships operating in polar waters). Leaving aside the weaknesses prevailing within the individual agreements, the fact that they belong to one of the mentioned categories points to one of the major deficits of the international regime for the Arctic marine environment: the lack of an overarching approach for integrated, ecosystem-based and cross-sectoral management. Cumulative impacts of temporarily and spatially competing human activities and interactions between different natural systems are thus not taken into account to a satisfactory degree, representing a considerable threat to the vulnerable Arctic marine environment. Like the phenomenon of institutional fragmentation, legal fragmentation prevents the adoption of a holistic perspective that would ensure consideration of interactions influencing the marine environment and the application of an ecosystem-based approach taking into account interdependencies among species.

Furthermore, the establishment of MPAs in the marine Arctic is advanced poorly. Although recognised as an important and effective tool to protect vulnerable and rare ecosystems and habitats, biodiversity or individual species, only few parts of the marine Arctic have been designated as protected areas, even though the international community pledged to establish a network of representative MPAs.

The situation is especially worrisome with regard to ABNJ: The establishment of MPAs in this zone is facing various uncertainties as to its legal basis and its compatibility with the principle of the freedom of the high seas, which results in a cautious approach to creating MPAs in this zone. However, especially in ABNJ, MPAs are needed urgently, as the regime for protection and conservation of biodiversity in these parts of the seas and oceans is a particular weak one. It is still dominated by the principles of high seas freedoms and flag state jurisdiction. Furthermore, the regime for ABNJ suffers particularly from legal and institutional fragmentation, lacking adequate coordination and cooperation between different responsible bodies competent for individual activities or species. Besides, many activities on the high seas like bioprospecting are not or not adequately regulated, in particular threatening the fragile deep-sea ecosystems. On top of that, activities on the extended continental shelf and on the high seas lack a regime for their coordination—a deficit that will be of particular relevance in the Arctic where large parts of the seabed are expected to be part of the extended continental shelves of the coastal states.

The regime for high seas fisheries serves as a good—or rather: sad—example to illustrate the indicated weaknesses of the legal regime for ABNJ. As the undertaken analysis of the regime for high seas fisheries in the Arctic has revealed, there are gaps in coverage of responsible bodies; where they do exist, their mandates, participation and spatial scopes are incomplete. Furthermore, many RFMOs have not been completely updated to match the standards set by the FSA, which in return suffers from its imperfect scope.

Of course, the identified deficits of the international legal regime for the marine Arctic and in particular for its ABNJ, do not apply to this region alone, but apply to

the marine environment all over the world. However, in the Arctic, the legal and institutional weaknesses become particularly apparent. Melting sea ice and the new accessibility of formerly ice-covered parts of the marine Arctic with the consequent uptake and intensification of human activities, make the mentioned debilities visible like under a burning glass. Many environmental hazards will be realised at the same time, revealing the shortcomings regarding comprehensiveness of the governance regime, coordination and cooperation of responsible bodies, sufficiency of environmental standards etc.

The highlighted deficits clearly show that the current international regime for the marine Arctic is poorly equipped to ensure adequate management and conservation of the environment. The question remains, how improvements can be achieved.

As world-wide interest in the Arctic has grown over the recent years, the need for improved governance of the environment has been recognised and various suggestions have been put forward for its achievement. Broadly speaking, proposals range between the two poles of enhancements within the current system or improvement by the creation of some kind of binding agreement.

Particularly the Arctic states reject the idea of a binding treaty on the ground of its alleged disadvantages. Along with some legal scholars they argue that a binding treaty would be lengthy to negotiate and bear the danger of agreeing on the lowest common denominator. As mentioned before, they furthermore claim that with UNCLOS there is already a sufficient legal framework in place—an argument that can hardly be upheld for the reasons cited.

In fact, in the light of existing and upcoming multiple stressors and competing uses, a comprehensive, integrated Arctic-wide treaty would be the best option to provide for sustainable management. The advantages of a binding Arctic Treaty outweigh its disadvantages: A binding agreement would provide the normative pull necessary to ensure adherence to substantial obligations to conserve and manage the Arctic marine environment. Its provisions could be enforced and non-adherence could be sanctioned. In contrast to the current regional soft law regime, a binding treaty would thus not lack the necessary teeth to ensure its principles are followed.

However, the chances of an overarching Arctic Treaty for environmental protection being concluded are not very high at the moment. The Arctic States have clearly expressed their opposition to this idea and demonstrated their preference for a piecemeal enhancement of the current regime.

As indicated, high seas fisheries may act as driving forces. The prospect of large fleets of distant-water fishing nations such as China entering the high seas portion of the marine Arctic may persuade the littoral states that a new fisheries agreement is necessary to ensure compatibility of national conservation measures and to prevent or eliminate IUU fishing. It is unlikely, though, that the uptake of commercial fishing in the high Arctic would win the Arctic states over to a multi-sectoral comprehensive treaty. The recently concluded Arctic SAR Agreement has demonstrated that the Arctic States tend to adhere to a sectoral approach. At the same time, though, they have indicated that they are ready to accept—and arguably seek—the involvement of a broader group of states, albeit with limited influence.

Thus, for the current situation, it is probably not useful—although desirable—to propose a comprehensive, legally binding solution in the absence of political support from the main players. A successfully implemented Arctic Treaty would need the broad support of the Arctic states. As long as this support is not provided, necessary enhancements of the environmental governance regime rightly or wrongly must continue to take place within the current system.

To safeguard the marine Arctic, a close collaboration between the responsible bodies will be essential. Coordination and cooperation are key issues to achieve sound management. The exchange of information and the development of common standards would be needed to ensure uniform guiding principles.

Furthermore, area-based measures will be crucial to minimise adverse effects from multiple ocean uses. Marine spatial and temporal planning, especially on the high seas, is indispensable. Potentially, pioneering efforts could be implemented in the Arctic Region, e.g. regarding high seas MPAs.

However, like the treaty-based approach, area-based management requires that the Arctic States and other interested nations agree on measures to be taken.

To get the Arctic States "on board", non-regional states will have to make clear that their "intent is not to make the Arctic a nature reserve, but to allow for sustainable use and development".[124] First of all, subsistence activities of the Arctic indigenous peoples must be safeguarded. Secondly, the rights of the Arctic coastal states with regard to the areas under their jurisdiction have to be respected. On the other hand, non-Arctic states should continue to make clear that they have a legitimate interest in conservation and management of the Arctic as well, particularly with regard to ABNJ. If and when a balance is found between respecting the rights of the regional states and influencing the matter of marine environmental protection, particularly on the high seas, non-regional nations might succeed in convincing the Arctic States to include other interested states in the process of enhancing environmental governance of the marine Arctic.

However, time is running out. Necessary improvements within the current system have to take place immediately. The regional climate is changing rapidly with a concurrent increase in the accessibility of formerly permanently ice-covered waters. To protect and preserve the unique Arctic marine environment, region-specific management instruments need to be in place before competing ocean uses begin.

[124] Nowlan, *supra* note 43, p. 58.

Chapter 5
Summary

The Arctic Region is affected heavily by global warming. In the past 100 years, surface temperatures in the area have increased at almost double the global average rate corresponding with a rise in mean annual temperature by about 2–3 °C and up to 4 °C in winter since the 1950s.

The reasons why the Arctic warms faster than the rest of the world are numerous and involve several feedback processes that create a reinforcing cycle that will likely result in an acceleration of climate change, meaning the Arctic will warm up even more rapidly over the next 100 years.

The most prominent implication of rising temperatures in the Arctic is the retreat of sea ice. During the last 30 years, the annual average sea-ice extent has decreased dramatically, by about 8 % or nearly 1 million km^2. Arctic sea ice is melting at a markedly faster rate than projected by computer models. This underscores how rapidly changes in the Arctic climate are occurring. By 2100, declines of roughly 10–50 % in annual average sea-ice extent are expected, with reduction projected to be considerably greater than the annual average decrease. Due to some model projections, sometime between 2050 and 2100, the Arctic will be completely sea-ice free in summer. According to other studies, the recent retreat of Arctic sea ice is likely to accelerate so rapidly that the Arctic Ocean could become nearly devoid of ice during summertime as early as 2040.

Though being the most obvious consequence of climate change in the Arctic, the retreat of sea ice is just one observation among many. Higher temperatures in the Arctic have also lead to changes in the circulation regimes of air and ocean currents, alterations in wind and precipitation patterns, vegetation and species shifts as well as species extinctions and increasing UV impacts, to name only a few.

The retreat of sea ice will probably open up new shipping routes and increase the use of existing ones, not only for the carriage of goods, allowing shorter shipping routes, and therefore lower costs, but also for tourism activities like cruise shipping. Fishing is likely to extend to new areas outside the EEZ of the Arctic coastal states, following the northward movement of many valuable arctic fish stocks such as herring and cod into the high seas. And of course the melting of the ice whets the

L. Weidemann, *International Governance of the Arctic Marine Environment*, Hamburg Studies on Maritime Affairs 27, DOI 10.1007/978-3-319-04471-2_5,

appetite for the exploitation of the huge oil and gas resources expected to exist in the region.

All these activities will affect the unique and fragile Arctic environment that is already under pressure due to several environmental concerns, among them acidification, POPs, oil pollution, heavy metals and radioactivity.

These factors compound the fact that the severe climate of the Arctic makes it a fragile environment particularly sensitive to human disturbance. For example, low temperatures slow down the decomposition of natural and manmade substances and the breakdown of pollutants. Ecosystems are also especially vulnerable because they generally consist of very few key species, which are also highly specialized and thus limited in their ability to respond to warming.

The unprecedented changes resulting from climate change and the arising economic activities raise the question of whether the current legal regime for the Arctic is sufficient to govern the various activities and to adequately protect the unique environment.

Unlike the Arctic's southern counterpart, the Antarctic, there is currently no single comprehensive legal regime. The region is regulated by a patchwork of international treaties, most importantly UNCLOS, various regional and sub-regional agreements, national laws and soft law agreements.

The regional soft law regime is built on cooperation between Arctic states and has a comparatively short history. Until the so-called 'Murmansk speech' by Mikhael Gorbachev in 1987, in which he called, *inter alia*, for cooperation among the northern countries in the field of environmental protection, no serious attempt for Arctic collaboration had been made. Eventually, the concern about transboundary environmental hazards triggered the first multi-lateral cooperation among the Arctic states. A Finnish diplomatic initiative led to the signing of the 'Declaration on the Protection of the Arctic Environment', including the adoption of the Arctic Environmental Protection Strategy (AEPS).

It identified priority pollution problems in the Arctic and laid the foundation for different Working Groups. After several years of circumpolar Arctic cooperation through these groups, the Arctic Council subsumed the AEPS in 1997, continuing the work of the AEPS and broadening its mandate to include sustainable development.

Today, the Arctic Council is the preeminent body for circumpolar Arctic co-operation. It is a high-level intergovernmental forum that brings representatives of Arctic society together for meetings several times a year. Representatives of the eight Arctic states—Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, Sweden and the United States of America—assemble with delegates of indigenous peoples' organisations from around the Arctic to address matters of common concern. Observers from other countries and organisations with Arctic interests also attend these meetings.

The major achievements of the AEPS from 1991 to 1997 and the Arctic Council from 1997 onward have been to document threats concerning Arctic marine ecosystems and to address a variety of issues ranging from environmental

protection to climate change and sustainable development in the region holistically, in a manner that transcends the boundaries of national jurisdiction.

However, neither the AEPS nor the Arctic Council was ever intended to create legally binding obligations for the Arctic states. They were designed to support a common policy development for implementation ultimately via the state's environmental laws and policies. Emphasis is put on scientific research and singling out of priority areas of concern, but not on cooperative remedy. This is partly owed to the fact that the Council does not control resources to launch substantial programs of its own. In short, the Arctic Council, as the most important body for circumpolar cooperation, suffers from severe limitations.

In addition, the number of organisations becoming involved in Arctic matters is increasing at rapid pace. Therefore, the Arctic Council needs to clarify the division of labour between its own activities and those of other, formally unrelated cooperative arrangements dealing with Arctic issues [e.g. the Barents Euro-Arctic Council (BEAR), the Nordic Council of Ministers, the Northern Forum or the International Arctic Science Committee (IASC)]. Due to the need for increased coordination and the confusion that prevails in its absence, there is a real threat of exhausting the scarce resources that can actually be dedicated to Arctic cooperation. In addition, this institutional fragmentation constitutes a considerable impediment for an ecosystem-based approach for environmental protection, because environmental hazards are dealt with at different levels by different bodies. This is particularly significant, as the competing uses of the ever more accessible Arctic Ocean include multiple, interactive, and cumulative stressors.

The frequently used assertion, that there is no necessity for a new legal regime for the Arctic because UNCLOS already provides a legal framework to govern the region is misleading. Besides the fact that the United States, as one of the main players within the eight Arctic states is not yet a party to UNCLOS, it has to be kept in mind that UNCLOS is merely putting up a framework. Additionally, UNCLOS provisions are quite general, meaning it does not provide for the challenges of protecting an environment as unique and sensitive as the Arctic region. Leaving aside the important exception of Article 234 on ice-covered waters, UNCLOS makes no specific reference to environmental management of polar oceans and seas.

In their common declaration adopted during a meeting in Ilulissat, Greenland, on 28 May 2008, the five states bordering the Arctic Ocean (Canada, Denmark/Greenland, Norway, the Russian Federation and the United States) asserted that they see no necessity for the development of a comprehensive Arctic Treaty because there is already an adequate legal framework in place.

However, apart from the indicated weaknesses of UNCLOS, there are considerable deficits in the legal framework applicable to the Arctic marine environment. The relevant agreements can be grouped into three different categories: treaties regulating certain areas of the marine Arctic, such as OSPAR, species-specific treaties, such as the Polar Bear Agreement, and sector-specific treaties, such as the Polar Code on ships operating in polar waters. This categorisation indicates one of the major deficits of the current legal regime: it lacks an overarching perspective

that would ensure integrated, cross-sectoral and ecosystem-based management. Individual environmental issues are dealt with on a piecemeal-basis, thus widely ignoring cumulative impacts from various economic activities as well as interactions and interdependencies between different natural systems. Especially with regard to ABNJ, the current legal and institutional framework furthermore suffers from its fragmentation, from unregulated or not sufficiently regulated activities, or from the lack of a mechanism for transboundary environmental impact assessment.

Notably, the above-mentioned 'Ilulissat Declaration' does not refer to fisheries management or the requirement of integrated and cross-sectoral governance. Yet, the example of high seas fisheries makes the considerable gaps and weaknesses of the international framework apparent, if not their potentially serious consequences for the Arctic.

The most important regulatory gap with regard to fisheries refers to insufficient protection of fish stocks in the waters beyond national sovereignty and jurisdiction. The regime UNCLOS offers for the high seas emphasises the freedom of the high seas, especially with respect to marine living resources management and surface navigation. With regard to fisheries, it relies on the effectiveness of Regional Fisheries Management Organisations (RFMOs) and the voluntary compliance of States to ensure conservation and management of high seas living resources. UNCLOS obliges the states concerned to cooperate with respect to trans-boundary fish stocks and discrete high seas fish stocks but does not stipulate the form of cooperation. The implementing Fish Stocks Agreement (FSA), however, requires that fisheries for straddling and highly migratory fish stocks have to be managed at the regional level through RFMOs or Arrangements. Where there are no RFMOs or Arrangements, these must be established.

However, the limited scope of the FSA leaves a serious regulatory lacuna: it does not apply to discrete high seas fish stocks. This means a lack of protection in particular for deep-sea fish species that are endangered through bottom fishing.

In addition to the central Arctic Ocean, there are three pockets of high seas in the seas bordering the Arctic Ocean: the "Banana" hole in the Norwegian Sea, the "Loophole" in the Barents Sea and the "Doughnut" hole in the Bering Sea. All three areas are managed by a RFMO and/or a regional arrangement with competence over certain species. In the currently ice-covered high seas area in the central Arctic Ocean, the Northeast Atlantic Fisheries Commission (NEAFC) has a mandate over the "European" wedge, while other sectors in the central Arctic Ocean do not have any RFMO or other arrangement. The Arctic Council does not address fisheries issues at all. Thus, there is currently no single body responsible for the management and protection of Arctic fish stocks. Besides, the existing RFMOs often fall short of providing satisfactory mechanisms for conservation and management of high seas fish stocks: many set the total allowable catch (TAC) inconsistent with scientific advice at unsustainable levels, and additionally provide for opt-out procedures so that members not even have to comply with the undue TACs. Enforcement and compliance instruments are frequently inadequate and IUU fishing further undermines conservation efforts. In short: the present legal and institutional framework for governance of high seas fisheries in the Arctic leaves much to be desired.

However, as many valuable arctic fish stocks such as herring and cod, migrate northward and move into high seas areas or into the national waters of bordering states, it is clear that an appropriate management regime will be needed to govern and protect Arctic fish stocks in the foreseeable future.

This provides a potentially unique opportunity to employ an anticipatory approach and adopt a comprehensive governance system for sustainable management before serious damage occurs. Since almost all other oceans worldwide are overfished, there is naturally great interest in the exploitation of valuable fish stocks in the Arctic. The melting of the ice is the starting signal for fisheries. For once, these activities could be managed from the beginning, before overexploitation becomes a problem.

A first step in this direction was taken by the US through Senate Joint Resolution 17 calling for the creation of a new international fisheries management organization for the Arctic, and seeking a halt in the expansion of Arctic commercial fishing activities until this is achieved.

Yet, as soon as the Arctic Ocean high seas areas open up, care has to be taken of multiple stressors to the marine environment; other human activities will compete spatially with fishing and affect it by contamination or other repercussions. As all these activities and potential dangers to the environment are interconnected, the best option would be not to create isolated regimes governing sectoral activities such as fishing, shipping, exploitation of non-living resources etc. but to adopt a comprehensive treaty on an ecosystem-based approach.

The idea for a legal framework dedicated to the Arctic is not new. In light of the economic development fuelled by climate change, various suggestions have been made as to what sort of treaty should be adopted. On the other hand, the necessity of a comprehensive Arctic Treaty has been denied by political leaders as well as legal scholars for various reasons. The approach of creating a binding legal regime has been rejected by some because of the alleged disadvantages of a binding treaty, which are viewed as involving lengthy negotiations, the avoidance of contentious issues and therefore agreement on the "lowest common denominator" and inflexibility due to difficulties to adapt to changing circumstances.

However, the advantages of a binding legal agreement outweigh the disadvantages. The attractiveness of legally binding agreements derives particularly from the fact that they generate enforceable obligations and can provide for sanctions in case of non-adherence.

The creation of an "Arctic Treaty" would not imply that the Arctic Council is to play no significant role for the Arctic in the future. It is, and continues to be very valuable in formulating the Arctic's interest in international fora as it had done in the context of POPs under the Stockholm Convention. Reinforcing the influence of the Arctic in global forums could emerge as one of the most significant roles of the Arctic Council during the foreseeable future. This also shows that it is no argument against a binding agreement that many threats to the Arctic environment stem from outside the region. On the contrary, a comprehensive treaty with many participants could increase attention for issues affecting the region, in particular climate change, on the international stage.

As for the structure of a potential Arctic Treaty, it is tempting to orient towards the Arctic's southern counterpart, the Antarctic. However, due to substantial differences between the two poles it is highly unlikely that the adoption of a treaty based on the model of the Antarctic Treaty System (ATS) can be achieved for the Arctic. On the other hand, the ATS might very well provide valuable inspiration for the development of an Arctic Treaty.

However, the Arctic states will most probably remain very reluctant to concede power to other interested states. In fact, they have articulated their opposition to a new legally binding regime dedicated to the Arctic at various occasions. Unfortunately, prospects of the conclusion of an "Arctic Treaty" are consequently very low. However, non-Arctic states also have rights and responsibilities with regard to the Arctic marine environment, particularly as regards areas beyond national jurisdiction (ABNJ). If a balance is struck between voicing these rights and interests and respecting the rights of the coastal states, the international community will hopefully persuade the Arctic states to realise the necessary improvements.

These will most probably take place within the current legal and institutional framework. Most importantly, enhancements have to be realised regarding coordination and cooperation of responsible bodies; the safeguarding of coverage of the whole marine Arctic by competent institutions; the streamlining of environmental standards that are adapted to the special needs of the Arctic marine environment; the spatial protection of especially vulnerable ecosystems and habitats through MPAs; and a mechanism for (transboundary) environmental impact assessments.

Hopefully, action to enhance protection of the fragile Arctic marine environment will be taken before it is too late.

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