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Background Paper

Environmental Governance in the Marine Arctic

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4 September 2008

Arctic TRANSFORM is funded through the European Commission Directorate General for External Relations as a pilot project for transatlantic methods for handling common global challenges <http://ec.europa.eu/external_relations/index.htm> with Grant Agreement No. SI2.484596.

EXECUTIVE SUMMARY

The Arctic marine area includes both nation-state territories[1] as well as international space, which is legally beyond national jurisdiction according to the UN Law of the Sea Convention (UNCLOS). The borders of territorial waters are still to be clarified in some cases (e.g. Norway and Russia), and many countries outside the Arctic have strong interests in the region (e.g. China, EU and Japan). Increasingly, countries and interested stakeholders are discussing the need for a joint international effort to cope with the effects of climate change on the whole Arctic marine area.

Governance of the marine ecosystems within the Arctic is a critical issue, due to the growing pressure of activities like shipping, drilling and fisheries – pressures that will be exacerbated by global climate change. Increasingly, adaptation to climate change is being recognised as a key policy objective by policy makers, local indigenous peoples and a wide range of international stakeholders. Coherent governance structures encompassing local, regional, and global levels are especially important in the Arctic because the region both strongly impacts and is impacted by global systems.

This paper presents an overview of the existing institutional and legal framework relevant to environmental governance, as well as formal and informal governance structures in the Arctic marine area. It highlights the complexity of approaches applicable at the local, regional and international scales, rather than identifying gaps in governance at the sectoral scale. Examples of environmental governance in the Arctic marine area are presented to show types of possible approaches, including species-oriented approaches (e.g. polar bears and beluga whales) as well as regional, cross-sectoral approaches (e.g. Barents Sea and greater North-East Atlantic). As seen in the literature and recent policy developments, environmental governance increasingly aims to a place-based, ecosystem-based approach.[2] However, the practical steps needed to achieve the principles of ecosystem management will undoubtedly vary based on the specific issues and ecosystems to be addressed. Thus, it is important to recognise the value in combining multiple approaches to achieve coordinated international governance in the Arctic marine area.

Key policies in place

Governance of Arctic marine ecosystems includes a complex array of international treaties and programmes, bilateral agreements, national and sub-national laws, and non-governmental and governmental initiatives. Both governmental and non-governmental institutions are involved, including entities such as the Marine Mammal Commission, the Nordic Council, the Barents Euro-Arctic Council, the Alaska Nanuuq Commission, and the Russian Association of the Peoples of the North (RAIPON).

Since the early 20th century, a number of conventions and treaties have been put in place covering various aspects of the Arctic marine area:

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1 Canada, Denmark/Greenland/Faroe Islands, Finland, Iceland, Norway, Sweden, The Russian Federation and the United States of America.

2 Young, O., G. Osherenko, J. Ekstrom, L.B. Crowder, J. Ogden, J.A. Wilson, J.C. Day, F. Douvere, C.N. Ehler, K.L. McLeod, B.S. Halpern, and R. Peach. 2007. Solving the Crisis in Ocean Governance: Place-Based Management of Marine Ecosystems. Environment. 49 (4) 20-32.

- **regulation of specific parts of the Arctic marine ecosystems** (the International Convention on the Regulation of Whaling (ICRW), the UN Fish Stocks Agreement and the International Agreement for the Conservation of Polar Bears),
- **regulation in specific geographical segments of the Arctic marine area**, including both ecosystem and single-species approaches (the Convention on the Protection of the Marine Environment of the North-East Atlantic (OSPAR) or the Six-nation agreement on the protection of Pollock stocks in the Bering Sea or North Atlantic Marine Mammal Commission (NAMMCO)); and
- **regulation of specific activities potentially influencing the Arctic marine area** (UN Convention on the Law of the Sea (UNCLOS), the International Convention for the Prevention of Pollution from Ships (MARPOL) or the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter ("London Convention")).

In addition, there are non-binding policies that require the ongoing support of participating countries, which are a function of current national priorities and interests.

Summary evaluation

Some experts[3] have argued that the existing patchwork of conventions and agreements will not adequately facilitate sustainable management of the Arctic marine area in the near future. To address this challenge, multiple new initiatives aim to integrate and coordinate governance, spanning from the country, to circumpolar to global levels and including governmental and non-governmental stakeholders such as the indigenous peoples, industry and environmental organisations. There is an opportunity to create synergy among these efforts to effectively address the coming challenges for the Arctic marine ecosystems. The key question is whether existing treaties and initiatives provide an adequate foundation, or whether new institutions are needed to secure the appropriate governance of the environment in the marine Arctic. Experts on Arctic environmental governance have differing views on the subject, which signifies the importance of further discussion and policy refinement (see Tables 4 and 5 in the main report for a summary of experts' views).

It is important to note that the Arctic TRANSFORM project scope focuses on the Arctic marine area. Obviously, effective policies for Arctic marine governance are but one part of a broader Arctic policy framework for environmental governance. This paper thus excludes many environmental issues relevant to the Arctic, such as runoff from large rivers, Arctic haze, and the fate and transport of pollutants (e.g. persistent organic pollutants (POPs)). Furthermore, there are major powers outside the region with growing interest in the Arctic. European countries, especially the UK, France, and Germany, as well as China, Japan and South Korea are interested in science, energy and transportation in the Arctic. This increases the complexity of policymaking in the region.[4]

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3 See, for example, Nowlan, 2001; Rayfuse, 2008.

4 Nordregio, 2007, p. 8.

Acknowledgements

We would first like to thank Drs. Oran Young, F. Stuart Chapin, III and Paul Berkman for their thoughtful comments on this paper. In addition, our partners at the Arctic Centre and the Netherlands Institute for the Law of the Sea (NILOS) provided valuable feedback during the development of this background paper. We are particularly grateful for the comments from Erik Jaap Molenaar and Timo Koivurova.

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LIST OF ABBREVIATIONS

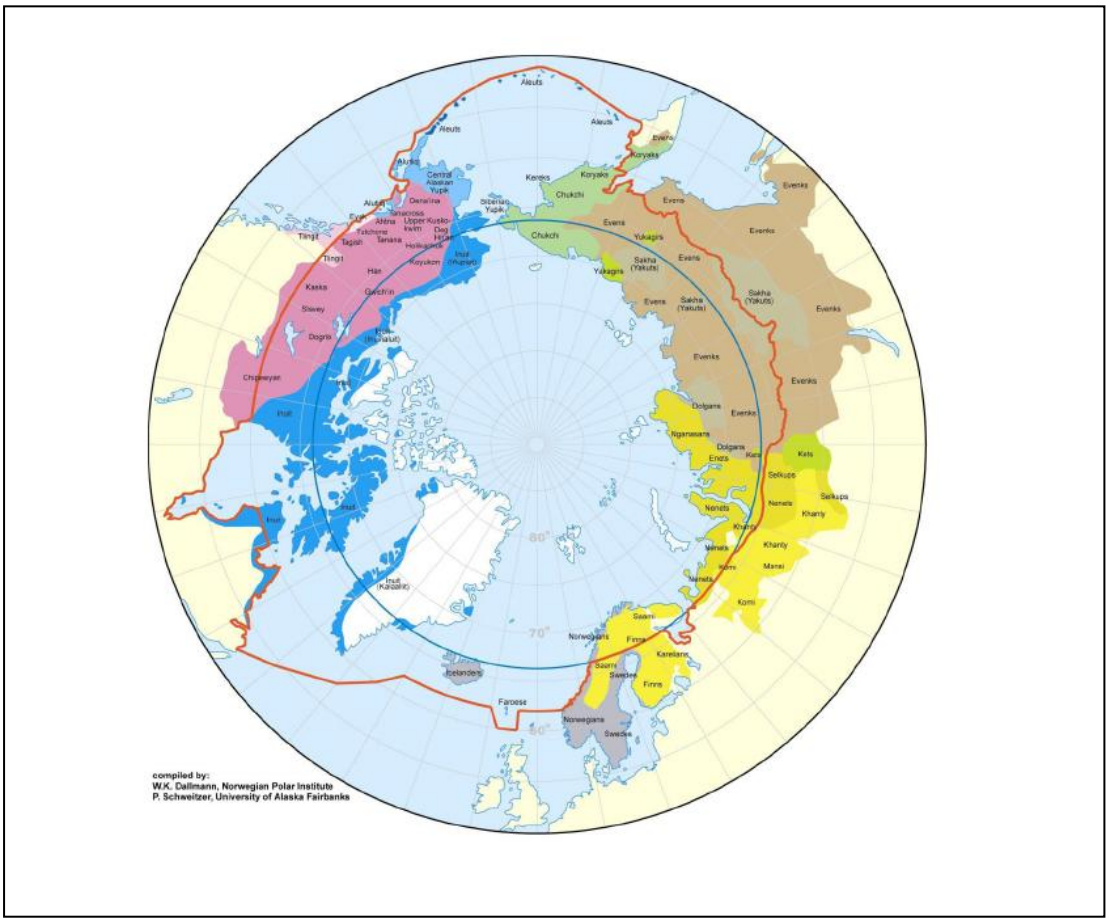
ACAP	Arctic Contaminants Action Program
AEPS	Arctic Environmental Protection Strategy
AESDF	Arctic Environment and Sustainable Development Fund
AHDR	Arctic Human Development Report
AMAP	Arctic Monitoring and Assessment Program
AMEC	Arctic Military Environmental Cooperation
ATS	Antarctic Treaty System
BAT	Best available techniques
BEAC	Barents Euro-Arctic Council
BEAR	Barents Euro-Arctic Region
BEP	Best environmental practices
BRC	Regional Council for the Euro-Arctic Region
CAFF	Conservation of Arctic Flora and Fauna
CASD	Commission on Arctic Sustainable Development
CBD	Convention on Biological Diversity
CCS	CO_2 capture and storage
CMS	Convention on the Conservation of Migratory Species of Wild Animals
CPAN	Circumpolar Protected Areas Network
CPAN	Circumpolar Protected Areas Network
ECE	UN Economic Commission for Europe
EEA	European Environment Agency
EEZ	Exclusive economic zones
EPPR	Emergency Prevention, Preparedness and Response
ICES	International Council for the Exploration of the Sea
ICRW	International Convention on the Regulation of Whaling
IMO	International Maritime Organisation
IUCN	International Union for Conservation of Nature
LME	Large Marine Ecosystem
MARPOL	International Convention for the Prevention of Pollution from Ships
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MPA	Marine Protected Areas
NAMMCO	North Atlantic Marine Mammal Commission
NEAFC	North East Atlantic Fisheries Commission
NOAA	US National Oceanic and Atmospheric Association
OSPAR	Convention on the Protection of the Marine Environment of the North-East Atlantic
PAME	Protection of the Arctic Marine Environment
PBSG	Polar Bear Specialist Group
POPs	Persistent organic pollutants
RAIPON	Russian Association of the Peoples of the North
RFMO	Regional Fisheries Management Organisations
SAO	Senior Arctic Officials
SDWG	Sustainable Development Working Groups
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Program
UNEP	United Nations Environmental Program
USFWS	United States Fish and Wildlife Service

1. INTRODUCTION

The Arctic marine area includes both nation-state territories[5] as well as international space, which is legally beyond national jurisdiction according to the UN Law of the Sea Convention (UNCLOS). The borders of territorial waters are still to be clarified in some cases (e.g. Norway and Russia), and many countries outside the Arctic have strong interests in the region (e.g. China, EU and Japan). Increasingly, countries and interested stakeholders are discussing the need for a joint international effort to cope with the effects of climate change on the whole Arctic marine area.

Within this project, the 'Arctic marine area' has been defined according to the spatial extent defined by the Arctic Council's Arctic Monitoring and Assessment Programme (AMAP) (Figure 1).

Figure 1: Arctic marine area boundary, based on the Arctic Council's Arctic Monitoring and Assessment Programme (AMAP) with local indigenous peoples according to language families.



Source: Arctic Council, available online at: http://arctic-council.org/filearchive/AHDRmap_lan-3.jpg

[5] Canada, Denmark/Greenland/Faroe Islands, Finland, Iceland, Norway, Sweden, The Russian Federation and the United States of America.

Although less is known about the marine environment as compared to the terrestrial environment, loss of sea ice will reduce habitat for ice-dependent species (e.g. polar bears and ringed seals), while increasing open water habitat that could benefit other species (e.g. whales).[6] Some commercial fisheries (e.g. cod and herring in the North Atlantic) may benefit from warmer temperatures,[7] although changes in biological processes throughout the entire ecosystem make the distribution and size of fish stocks hard to predict.[8]

Melting sea ice will not only result in changes to the flora and fauna, but will allow unprecedented access for shipping and exploitation of offshore hydrocarbon, thereby possibly threatening migratory birds and mammals, as well as entire ecosystems, with significant impacts on local people and their way of life.

Since the end of the Cold War, development of pan-Arctic cooperation especially through the Arctic Council, the North Atlantic Marine Mammal Commission (NAMMCO) and the Inuit Circumpolar Council[9] has strengthened the voice for indigenous peoples and provided increased knowledge of the Arctic environment.[10] The challenge is to further enhance efforts to promote strategies to adapt to the impacts of global climate change. The work undertaken by this project will focus on the identification of transatlantic policy options in this context.

The following paper presents an overview of environmental governance in the Arctic marine area. A general discussion of environmental governance is followed by a summary of the existing legal and policy framework at the global and regional levels, with a focus on multilateral agreements, as well as informal initiatives and cooperation networks. Four policy examples are presented to show the complexity of the situation in the Arctic marine environment, including species-based approaches for the management of the polar bear and beluga whale, as well as regional, cross-sectoral approaches in the Barents Sea and North-East Atlantic oceans through the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention).

2. ENVIRONMENTAL GOVERNANCE

Governance is an overarching and general term used to describe methods and institutions that guide human behaviour toward certain goals.[11] Governance exists at all scales and covers multifaceted and interconnected issues. Environmental governance can be defined as follows:

> "the formal and informal arrangements, institutions, and mores which determine how resources or an environment are utilized: how problems and opportunities are evaluated and

6 ACIA, 2005, p. 520.

7 IPCC, 2007, p.669.

8 ACIA, 2005, p.520.

9 The Inuit Circumpolar Conference (later renamed Council) was established in 1977, but did not include indigenous peoples from Russia until 1989.

10 ACIA, 2005, p. 956.

11 Juda and Hennessey, 2001, p. 44.

> analyzed; what behaviour is deemed acceptable or forbidden; and what rules and sanctions are applied to affect the pattern of resource and environment use".[12]

Due to the inherent complexity of natural resource use, a myriad of approaches have been applied to governance. These approaches range from targeting a single species, sector or issue (e.g. pollution) to broader cross-cutting strategies. Depending on the context, these approaches involve various actors from the local to international levels, with participation from stakeholders with diverse perspectives. At the same time, they can be categorised as legally binding (i.e. hard law) or not legally binding (often referred to as soft law) with varying levels of enforcement.

These inter-related, overlapping and at times conflicting approaches will be further challenged by the impacts of global climate change, as access to, and distribution of these resources change. It is impossible to create an exhaustive list of approaches, and often multiple approaches are combined in a single management example. However, it is important to recognise that a spectrum of options exists, and that a combination of these options could provide the foundation for a new flexible governance framework in the Arctic.

1.1. Marine Governance: Large Marine Ecosystems (LMEs)[13]

Approaches to governance in marine environments are often less developed than in terrestrial environments. Implementation of natural resource management in marine ecosystems is arguably more difficult than in terrestrial ecosystems due to the lack of visible boundaries between marine ecosystems and the vast areas of international waters. In addition, it is important to note the importance of the linkage between terrestrial and marine ecosystems. The Arctic Ocean receives more river runoff than any other global ocean, and at the same time provides more opportunities for management at the land-water interface than other more populated areas.

One approach to help distinguish priority areas for policy action is the Large Marine Ecosystem (LME) concept, built on the general principles of ecosystem management. LME boundaries are becoming widely used at the international scale to distinguish highly productive areas around the globe for marine ecosystem management.[14] LMEs encompass relatively large areas of approximately 200,000 km^2 or greater and have distinct bathymetry, hydrography, productivity and trophically dependent populations.[15] They can be evaluated with respect to their productivity, fisheries, pollution, ecosystem health, socioeconomic conditions, and governance.[16] In addition, they draw attention to the need to understand complex changes in multiple species interactions and the need to manage for resilience rather than composition or structure.

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12 Juda, 1999, pp. 90-91.

13 Many of the ideas in this section were provided by Dr. Stuart Chapin via personal communication.

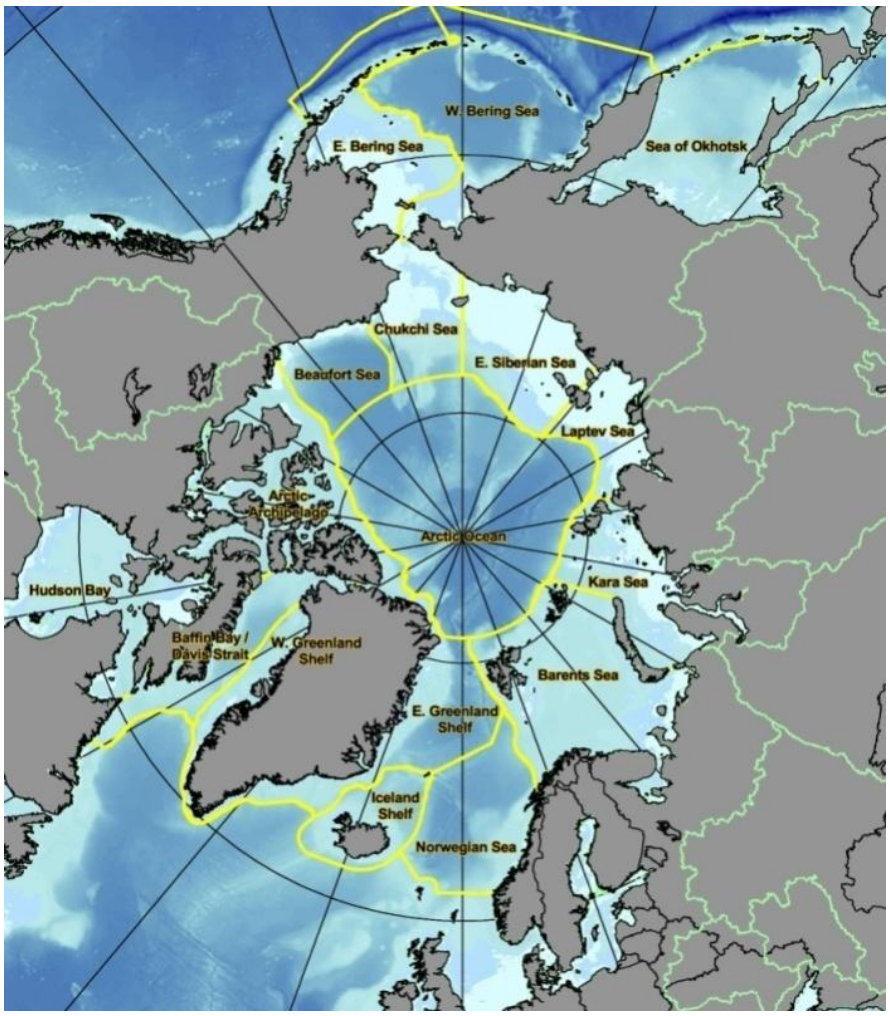
14 LMEs are used among others by UNEP, UNDP, World Bank, US National Oceanic and Atmospheric Association (US NOAA), and the Arctic Council.

15 Sherman, 1994, p.280.

16 Juda and Hennessey, 2001, p.44.

As shown in Figure 2, the Arctic Council Protection of the Arctic Marine Environment (PAME) working group has developed LMEs in the Arctic to use as the framework for the Arctic Marine Strategic Plan.[17] LMEs provide a practical basis to evaluate shipping, fishing and tourism at the regional level. There is also a joint project through the PAME and Sustainable Development Working Groups (SDWG) on Best Practices in Ecosystem-Based Ocean Management in the Arctic (BePOMAr Project) that is a priority for the Norwegian Chairmanship.[18] At the same time, there are efforts to develop Marine Protected Areas (MPA) in the Arctic. Although approximately 20% of the land in the Arctic is protected, less than 2% of Arctic marine and coastal ecosystems are protected according to data from the 2003 World Parks Congress.[19]

Figure 2. Draft map of Large Marine Ecosystems in the Arctic.



(*Source: Adapted from PAME October 2006 Draft map. http://www.lme.noaa.gov*)

[17] The final report from the meeting of the Senior Arctic Officials (SAO) on November 27-28, 2007 states 'The PAME Chair reiterated that the working map of the 17 Arctic Large Marine Ecosystems (LMEs) was endorsed by Ministers in 2006 and is the LME working map of the Arctic Council.'

[18] See, http://arctic-council.org/article/2008/4/successful_sao_meeting.

[19] CAFF, 2004, foreword.

With continued focus on Arctic governance, it will be important to evaluate existing governance structures to determine how lessons learned can be applied in other places in the Arctic and to adaptation needs. Different governance structures are likely to be needed to address different governance goals. Coherent governance structures encompassing local, regional, and global levels are especially important in the Arctic because the region both strongly impacts and is impacted by global systems. Multi-level governance structures will allow flexibility, although it is important to evaluate the trade-off between flexibility and enforceability.

The following section outlines the legal and policy framework in the Arctic marine environment.

1.2. Legal and Policy Framework

Governance of marine Arctic ecosystems includes a complex array of international treaties and programmes, bilateral agreements, national and sub-national laws, and non-governmental and governmental initiatives. The existing governance of Arctic marine ecosystems involves both hard and soft-law mechanisms, state and non-state actors, as well as innovative initiatives[20] that incorporate a variety of stakeholders, including indigenous peoples.[21] The following presents a summary of the global and regional instruments and bodies involved in governance of the marine Arctic environment, including both binding and non-binding approaches (i.e. both the formal cooperation through the Arctic Council as well as informal arrangements).[22] It is important to note at the outset that legally binding approaches are not necessarily preferable to non-binding approaches.

1.3. Global agreements

Global treaties relevant to marine Arctic ecosystems are numerous and address issues ranging from the establishment of protected areas and species protection to reducing greenhouse gas emissions, pollution prevention and emergency preparedness. In addition, there are conventions dealing specifically with ship-related pollution, dumping, the transport of hazardous waste and persistent organic pollutants (POPs), as well as conventions aimed at implementing a more ecosystem-based approach.

The **United Nations Convention on the Law of the Sea (UNCLOS)**[23] (adopted in 1982, entered into force 1994) provides the basic framework for jurisdiction of and resource control in marine areas. A key concept of UNCLOS is establishing the right of states to claim exclusive economic zones (EEZ) up to 200 nautical miles from the baselines. The EEZ is

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[20] Co-management schemes have been cited in particular as being innovative governance mechanisms.

[21] Young, 2002, p. 6.

[22] See the Annex for a comprehensive overview of global treaties, conventions and agreements relevant to Arctic marine ecosystems.

[23] The full text of this Convention can be found at http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf.

subject to a special legal regime under which the coastal state exercises certain sovereign rights, although the EEZ is not part of its territory. UNCLOS also addresses issues related to the protection of the marine environment, with respect to marine pollution, land-based pollution, dumping and fisheries. UNCLOS notably confirms and designates the authority to coastal states to create and enforce laws to control marine pollution within their national territories and EEZ, designating minimum standards for dumping regulations.[24]The only direct reference to the Arctic is in Article 234, which establishes the right of coastal states to legislate for the "prevention, reduction and control of marine pollution from vessels in ice-covered areas" in their EEZ. Although considered the foundation of the international legal framework for marine areas, as shown in Table 1, UNCLOS has only recently been ratified by Denmark and Canada, and remains to be ratified by the United States.[25] With the exception of Iceland, all Arctic countries and the European Community ratified UNCLOS after the *Agreement relating to the implementation of Part XI* was adopted in 1994 and entered into force in 1996 that addressed concerns – primarily of industrialised countries – related to seabed mining provisions contained in Part XI of UNCLOS.

Table 1. Year of Ratification of UNCLOS in Arctic Countries and the European Community.

Country	Year of Ratification of UNCLOS
Canada	2003
Denmark	2004
European Community	1998
Finland	1996
Iceland	1985
Norway	1996
Russian Federation	1997
Sweden	1996
United States	Not ratified

Source: UN Law of the Sea Convention (available at: http://www.un.org/Depts/los/reference_files/chronological_lists_of_ratifications.htm#Agreement%20relating%20to%20the%20implementation%20of%20Part%20XI%20of%20the%20Convention)

UNCLOS, despite providing the basic legal framework for law of the sea, does not claim to cover all aspects of ocean governance, and refers to other international instruments and bodies that have competence in this area. It is important to note that the challenge in

[24] Nowlan, 2001, p. 17., Stokke, 2007, pp. 403-4.

[25] For a more thorough treatment of the potential U.S. ratification of UNCLOS, see Sobel, et al., 2007.

managing pollution in a transboundary context that involves nation states – within their national territories and EEZ) as well as international space (outside national jurisdiction) in the Arctic Ocean.

Other global conventions dealing specifically with marine pollution include the **International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)** (Convention adopted in 1973, amending Protocol adopted in 1978, entered into force 1983),[26] which is the main international convention for preventing pollution of the marine environment by ships and addresses oil, chemicals, harmful substances in packaged form, sewage, garbage and air pollution. MARPOL also designates 'special areas' and 'particularly sensitive sea areas' that are potentially more vulnerable to pollution from oil, garbage, sulphur emissions and therefore require more stringent protection measures. Antarctica was designated a 'special area' in a 1990 amendment to MARPOL but the Arctic has no areas with this designation.[27] In addition, inadequate compliance with the standards put forth by MARPOL have been cited as a drawback, since enforcement is through a vessel's flag state and therefore the state is left with the final say as to the extent of compliance.[28]

Other relevant agreements include the **Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter ("London Convention")** (adopted in 1972, entered into force 1975), which as an instrument regulating dumping in marine areas is particularly relevant to protecting the marine Arctic, as there have been problems with the dumping of wastes (including radioactive waste) in the Arctic.[29]

Since pollution and contaminants, particularly from sources in lower latitudes, accumulate in the Arctic and adversely affect its inhabitants and marine life, land-, sea- and air-based pollution remain a major concern for the fragile ecosystems. It was therefore a major success when the **Stockholm Convention on Persistent Organic Pollutants**[30] was adopted in 2001 (entered into force 2004) after a considerable advocacy effort of Arctic indigenous peoples' organisations and the Arctic Council. The Convention recognised the negative effect persistent organic pollutants (POPs) have on humans and the environment. Due to their chemical properties, POPs are capable of long range transport by air and through the food chain, and the compounds tend to accumulate in cold regions, and specifically in animal tissue. Since the traditional diet of indigenous peoples is based on fish, exposure of these groups is considerably higher than in other regions. The Stockholm Convention initially banned 12 toxic pollutants. Each party, in addition, is required to develop a national implementation plan for the reduction of POPs.[31] Although all Arctic States have signed the Convention, Russia and the US have not yet ratified it and Denmark has entered a territorial

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26 The Convention entered into force together with Annex I. Annexes II-VI entered into force at later stages.

27 The web-page of the International Maritime Organisation (IMO). http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258, viewed 7 April 2008.

28 Rothwell, 2000, p. 63.

29 Ibid, pp. 64-5. Russia has been cited in particular as utilising the Arctic for dumping radioactive waste. See: Stokke, 2000, pp. 200-220 for a thorough discussion of the London Convention and the development of radioactive waste regulation in the Soviet Union and Russia.

30 The full text of the Convention can be found at http://www.pops.int/.

31 UNEP GRID-Arendal, 2006, p. 14.

exclusion with respect to the Faroe Islands and Greenland.

Other land-based pollution still lacks regulation in the Arctic and around the world. Efforts by the UN with their **Global Programme for Action for the Protection of the Marine Environment from Land-based Activities**[32] (adopted in 1995) and the Arctic Council's **Regional Programme for Action for the Protection of the Arctic Marine Environment from Land-based Activities**[33] (adopted in 1998) are possibly first steps toward a legally binding convention, but remain ultimately non-binding in nature.

Although wildlife management and protection is mostly at the national level, there are a number of relevant international instruments geared toward this purpose. Species-specific initiatives include the **International Convention on the Regulation of Whaling**[34] (ICRW) (adopted in 1946, entered into force 1948) and the **International Agreement for the Conservation of Polar Bears** (adopted in 1973, entered into force 1976). Frameworks like the **Convention on the Conservation of Migratory Species of Wild Animals**[35] (CMS) (adopted in 1979, entered into force 1983) aim at a broader protection of wildlife. Although CMS has no particular focus on the Arctic, there are numerous migratory species that inhabit the Arctic for part of the year.[36] Only four of the eight Arctic countries are parties to this convention however, limiting its efficacy.

Fisheries management on a global and non species-specific level is regulated through the **UN Fish Stock Agreement**[37] (adopted in 1995, entered into force 2001) complemented by the soft-law **FAO Code of Conduct for Responsible Fisheries**[38] (adopted in 1995). All Arctic States are party to the UN Fish Stocks Agreement.

The Convention on Biological Diversity[39] (CBD, adopted in 1992, entered into force 1993) marks a departure from the issue-specific agreements, concentrating on conservation and sustainable use of biological diversity as well as the fair use of its resources. For the *components* of biological diversity, the CBD applies only in areas within the national jurisdiction of each party. In contrast, in respect of *processes and activities,* the CBD applies regardless of where their effects occur, provided that they are carried out under the party's jurisdiction or control.[40] This would include processes and activities carried out in Arctic waters including the High Seas. In addition to its broad focus, CBD contains a strong

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32 The full text of this Programme can be found at http://www.gpa.unep.org./.

33 The full text of this Programme can be found at http://arctic-council.npolar.no/About/376_eng.pdf.

34 The full text of this Convention can be found at http://www.iwcoffice.org/commission/convention.htm#convention.

35 The full text of the Convention can be found at http://www.cms.int/documents/convtxt/cms_convtxt.htm.

36 UNEP GRID-Arendal, 2006, pp. 10-11.

37 The full text of the Agreement can be found at http://daccess-ods.un.org/access.nsf/Get?Open&DS=A/CONF.164/37&Lang=E.

38 The full text of the Code of Conduct can be found at http://www.fao.org/DOCREP/005/v9878e/v9878e00.htm.

39 The full text of the Convention can be found at http://www.cbd.int/doc/legal/cbd-un-en.pdf.

40 Article 4 of the CBD.

emphasis on the establishment of protected areas.[41] Protected areas are utilised to conserve certain species or areas that have unique biodiversity or hold special global importance. Although no specific programme dealing with the Arctic environment exist within the CBD, the "Jakarta Mandate on Marine and Coastal Biological Diversity" (adopted in 1995) is directly relevant for the protection of Arctic marine species.

Other global instruments that provide for the designation of protected areas are the Convention for the **Protection of the World Cultural and Natural Heritage**[42] (adopted in 1972, entered into force 1975) and the **Ramsar Convention on Wetlands** (adopted in 1971, entered into force 1975), and many other instruments, including the above mentioned ICRW. One of the largest protected Ramsar wetlands in the world is Queen Maud Gulf in Nunavut, Canada, and numerous other Ramsar as well as Natural Heritage sites exist throughout Greenland, Scandinavia, Siberia, as well as on Svalbard and Iceland. Current protected areas, in order to be effectively protected, require a legal framework that guards the area from competing economic and political interests, while taking into consideration the needs of local populations. In addition, climate change and changing environments present an additional dimension to the continuation of existing and the establishment of new protected areas. A re-evaluation of protected areas may be necessary to ensure that the appropriate areas are receiving the required protection.[43] The protection of areas beyond national jurisdiction and its international law basis remain to be explored in the future.[44]

Table 2: Participation of Arctic countries in global treaties
(Source: Adapted from UNEP GRID-Arendal, 2006).

	Marine	Pollution			Environment				Biodiversity
	UNCLOS	MARPOL[1]	London	POPs	CMS	Heritage	Ramsar	Fish Stocks	CBD
	1982	1973/78	1972	2001	1979	1972	1971	1995	1992
Canada	Yes	Yes	Yes*	Yes	No	Yes	Yes	Yes	Yes
Denmark	Yes	Yes†	Yes*	Yes[2]	Yes	Yes	Yes	Yes	Yes
Finland	Yes	Yes†	Yes*	Yes	Yes	Yes	Yes	Yes	Yes
Iceland	Yes	Yes	Yes*	Yes	No	Yes	Yes	Yes	Yes
Norway	Yes	Yes†	Yes*	Yes	Yes	Yes	Yes	Yes	Yes
Russia	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Sweden	Yes	Yes†	Yes*	Yes	Yes	Yes	Yes	Yes	Yes
USA	No	Yes	Yes	No	No	Yes	Yes	Yes	No
Total Arctic Countries	7	8	8	6	4	8	8	8	7
Total parties globally	155	146	84	153	108	185	158	68	190

[1] Annexes I and II.

[2] This ratification was with territorial exclusion of the Faroe Islands and Greenland.

* Indicates that this country has also ratified the 1996 Protocol to the London Convention.

† Indicates that this country has ratified all of the Annexes to MARPOL.

41 Rothwell, 2000, pp. 72-3.

42 The full text of the Convention can be found at http://whc.unesco.org/?cid=175.

43 ACIA, 2005, pp. 604-5.

44 Warner 2001, pp. 147-166.

1.4. Regional regimes

The marine Arctic as a region is governed by the global instruments described above, regional and sub-regional initiatives as well as numerous bilateral agreements and national legislation.[45] An especially noteworthy regional initiative has been the **Arctic Environmental Protection Strategy** (AEPS) (adopted in 1991) by the eight Arctic countries[46], stemming from broad recognition of the need for more international co-operation in the Arctic, and the **Arctic Council** (created in 1996). The Arctic Council was created to strengthen the AEPS as an inter-governmental forum for discussions and policy-making for the Arctic environment as well as monitoring such initiatives and trends in the Arctic environment as a whole. The Arctic Council and its six working groups have effectively brought together actors and stakeholders in the Arctic to address environmental issues. Notably, the council significantly involves indigenous populations as permanent participants, whom the council must consult before making a decision.[47]

The Arctic Council's working group on **Protection of the Marine Environment (PAME)** has developed guidelines for economic activities in the Arctic and urged governments to take part in international treaties and conventions regarding the marine environment. The working group on **Arctic Monitoring and Assessment Program's (AMAP)** objective is environmental monitoring and coordination of research activities relating to contaminants, provides AMAP Assessment Reports, and was one of the important sources of scientific information that formed the basis for the Stockholm Convention on Persistent Organic Pollutants.[48] Despite widespread criticism of the status of the Arctic Council and the non-binding guidelines and recommendations it produces, AMAP has also successfully urged governments to act, specifically by investing more in monitoring activities of POPs.[49] The Arctic Council's **Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-Based Activities**[50] (adopted in 1998) sets as its objective the reduction of pollutants in the Arctic, focussing on POPs, heavy metals and regional sources of pollution. In conjunction with the above-described conventions, the Arctic Council's working group on **Conservation of Arctic Flora and Fauna (CAFF)** development of **Circumpolar Protected Areas Network (CPAN)** has promoted the establishment of protected areas in the Arctic, although the majority of these areas are terrestrial.[51]

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45 Nowlan, 2001, pp. 5-6.

46 The Arctic eight include Canada, Finland, Greenland, Iceland, Norway, Russia, Sweden and the United States.

47 The six working groups are Arctic Monitoring and Assessment Program (AMAP), Protection of the Marine Environment (PAME), Arctic Contaminants Action Program (ACAP), Conservation of Arctic Flora and Fauna (CAFF), Emergency Prevention, Preparedness and Response (EPPR), Sustainable Development Working Group (SDWG). WWF, 2008, p. 21.

48 For more information on AMAP activities, see the web-page of AMAP http://www.amap.no/.

49 Stokke, 2007, p. 405-6.

50 The full text of this Programme can be found at http://arctic-council.npolar.no/About/376_eng.pdf

51 CAFF, 2004, foreword.

Box 1: Comparing Environmental Governance in the Arctic and Antarctic

A number of studies have broached the topic of using the Antarctic governance framework as a model for a future regime in the Arctic.[52] The Arctic and Antarctic environments are both high-latitude regions with extreme environmental conditions. Both regions have large deposits of natural resources such as coal, natural gas and offshore oil reserves. Furthermore, because most of the central Arctic Ocean is outside national jurisdiction, arguably, the threat of claiming territories in the Arctic is similar to the situation in the Antarctic before the Antarctic Treaty was established.

Major differences between the two regions exist, however: the Arctic is primarily oceanic whereas the Antarctic primarily consists of an ice-covered land mass; the Arctic is characterised by the presence of indigenous populations whereas the Antarctic has virtually no permanent residents[53]; Arctic nations have territorial and marine claims in the Arctic, whereas territorial claims are on hold in the Antarctic, as stated in the Antarctic Treaty signed 50 years ago.

The Antarctic environment is governed primarily through the legally binding **Antarctic Treaty**[54] (1959) and its accompanying **Protocol on Environmental Protection to the Antarctic Treaty**[55] (1991), together with some 200 other arrangements called the Antarctic Treaty System (ATS). These constitute a regional co-operative effort in the sense that the treaty system addresses exclusively one region.[56] Emphasising that Antarctica should be used exclusively for peaceful purposes, the Antarctic Treaty promotes scientific research and international co-operation, and the 1991 Protocol essentially designates the region as a nature reserve, prohibiting claims to mineral deposits, regulating waste management and marine pollution.[57] The **Convention on the Conservation of Antarctic Marine Living Resources**[58] (1980), one of the numerous agreements belonging to the ATS, utilises a precautionary and ecosystem approach to regulate in particular krill fishing and all marine resources excluding seals and whales, which are governed by other instruments.[59] Despite the differences between the Antarctic and the Arctic, some aspects of the ATS, particularly its focus on security and peace, could serve as a model for a future Arctic regime.

Sub-regional multi-lateral co-operation has also been cited as an important component of marine Arctic governance.[60] Norway, Great Britain, Russia, and the U.S. co-operate on defence-related environmental projects through the **Arctic Military Environmental Cooperation** (AMEC).[61] Intergovernmental initiatives addressing a portion of the Arctic

[52] See Koivurova, 2008; Nowlan, 2001; Rayfuse, 2008; WWF, 2008.

[53] Millennium Ecosystem Assessment, 2005: Chapter 25: Polar Systems, pp. 719-20.

[54] The full text can be found online at http://www.ats.aq/documents/ats/treaty_original.pdf

[55] The full text can be found online at http://www.ats.aq/documents/recatt/Att006_e.pdf

[56] Vidas, 2000, p. 81.

[57] Antarctic Treaty, Articles 1-3.

[58] The full text can found online at http://www.ats.aq/documents/ats/ccamlr_e.pdf

[59] Rayfuse, 2008, p. 9.

[60] Vidas, 2000, p. 83.

[61] Further information on AMEC can be found at http://www.mil.no/felles/ffi/amec .

include the **Barents Euro-Arctic Region**[62] (BEAR) with its associated council and the **Norwegian/Russian Commission on Environmental Protection**. Barents Sea regimes are discussed in further detail below.

Other sub-regional legally binding approaches include the six-nation agreement on the protection of pollock stocks in the Bering Sea and the **Convention on the Protection of the Marine Environment of the North-East Atlantic**[63] **(OSPAR Convention)** adopted in 1992, entered into force 1998). The latter utilises an ecosystem-based approach for the management of the marine environment of the north-east Atlantic. OSPAR recommended in 2003 the establishment of a network of marine protected areas, four of which as of 2007 are in the Arctic.[64] OSPAR is discussed in further detail below.

The **North Atlantic Marine Mammal Commission**[65] **(NAMMCO)** has been cited for its more ecosystem-based approach to marine mammal protection, involving state and non-state actors, including indigenous populations.[66] Furthermore, NAMMCO is a regional co-operation and co-management framework for whales, seals and walruses among Norway, Iceland, Greenland and the Faroe Islands.[67]

Non-binding guidelines for economic activities have been provided by the Arctic Council and its working groups. In addition a Canadian initiative drafted **Guidelines for Ships Operating in Arctic Ice-covered Waters** (**Polar Code)** (drafted in 1998/2002) in the IMO, which outline safety procedures for ships in polar regions. Although the Polar Code is a non-binding regulation and remains in draft form, it has advanced several national initiatives in Arctic countries with regard to shipping safety.[68]

1.5. Informal approaches / initiatives

In addition to the legally binding and non-binding approaches to environmental governance, there are a large number of informal approaches and initiatives. Common characteristics of the informal approaches are: a lesser degree of institutionalisation, co-operation emerging on an ad-hoc basis, less complex decision making processes and less formal cooperation structures, such as verbal agreements.

Roughly five different types of informal approaches can be distinguished, based on the participating parties, as shown in table 3 below.

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62 Further information on BEAR can be found at http://www.beac.st.

63 The full text of the Convention can be found at http://www.ospar.org/eng/html/welcome.html. The OSPAR Maritime Area covers the north-east Atlantic and therefore includes but is not limited to part of the marine Arctic area referred to in this paper.

64 The four marine protected areas in the Arctic were nominated by Norway. OSPAR Commission, 2007, p. 10.

65 Further information can be found at http://www.nammco.no/.

66 Young, 2002, p. 9.

67 Arctic Human Development Report (AHDR), 2004, pp. 130-1.

68 Vidas, 2000, p. 94.

Table 3: Examples of informal approaches focused on environmental governance

Type of informal approach	Description	Examples and information sources
Government initiatives involving non-governmental groups	Wildlife co-management for instance – empowering local communities by allowing independent choice of practices and ways to achieve government goals	The Northern Ecosystem Initiative (NEI)[69] – Canada
		Contributions of Northern Wildlife Co-Management to Community Economic Development (CED)[70] – Northern America
		Alaska Nanuuq Commission[71] – US
Cooperation between researchers and local communities	Involving researchers and local communities providing vital information for the project / trying to bridge the gap between science and local knowledge	Arctic Fisheries Research in Canada: An Informal Perspective (G. Burton Ayles)[72] – Canada
		Marine Mammal Commission Workshop on the Impacts of Changes in Sea Ice and Other Environmental Parameters in the Arctic[73] – US
Cooperation between NGOs and local communities	Involving NGOs as donors and overall project managers and local communities implementing the project's objectives	WWF program for marine conservation in the Russian Far East[74]– Russia
Initiatives governed by local communities	Involving only local communities who have sought alliances for a common cause within their community and inside or outside their region	Sametinget[75] in Northern Scandinavia – Europe
		RAIPON[76]Small numbered peoples of the Arctic North – Russia
Cooperation initiatives between researchers or research institutes	Involving researchers and institutes with a common research interest in the Arctic	The Arctic Research Consortium of the United States ARCUS [77] – US
		The Association of Polar Early Career Scientists APECS [78] – International

69 See http://www.mb.ec.gc.ca/nature/ecosystems/nei-ien/index.en.html, viewed 14 July 2008.

70 See Kofinas, 1993, viewed 14 July 2008.

71 See http://www.nanuuq.info/index.html, 15 July 2008.

72 See http://www.carc.org/pubs/v15no4/5.htm, 14 July 2008.

73 See http://www.arctic.noaa.gov/workshop_summary.html, 15 July 2008.

74 Vassily Spiridonov, 2000-2008, web article.

75 See http://www.samediggi.no/artikkel.aspx?AId=884&back=1&MId1=270, 17 July 2008.

76 See http://www.raipon.org/About/Projects/tabid/308/Default.aspx, 15 July 2008.

77 See http://www.arcus.org/, 16 July 2008.

78 See http://arcticportal.org/apecs, 16 July 2008.

2. EXAMPLES OF ENVIRONMENTAL GOVERNANCE IN THE ARCTIC MARINE AREA

The Arctic marine area has varied and complex governance frameworks at international, regional, national and sub-national levels, involving state and non-state stakeholders. The array of economic, political, social and environmental interests in the Arctic marine area will change and possibly diversify as the effects of climate change unfold. The following section examines four examples of governance approaches that highlight the diverse focuses, approaches and actors in governance of the marine Arctic. In looking at these and other Arctic examples, principles and practices may emerge that could be applied when considering transatlantic policy options for adaptation in the Arctic marine environment.

2.1. Species-based approach: Polar bear management

Polar bear management presents a unique example of several governance mechanisms – multilateral and bi-national agreements, national laws, sub-national regulations and co-management schemes – and their interaction, that are geared toward protecting and conserving polar bears in the Arctic. After accumulating evidence in the 1960s that the harvesting of polar bears was endangering populations, five Arctic countries convened in Fairbanks, Alaska, to discuss the status and strategy for management of polar bears.[79] The **International Agreement on the Conservation of Polar Bears** between Canada, Norway, Russia, the United States and Denmark, established research co-ordination and dedication to the conservation of polar bears through the preservation of polar bear habitat. Furthermore, it prohibited the 'taking' polar bears except for scientific and indigenous subsistence purposes. The agreement represented a historic international co-operation in the Cold War era.[80] The International Union for Conservation of Nature (IUCN) Polar Bear Specialist Group (PBSG), convened prior to the treaty in 1968, meets every three to five years to co-ordinate management and research of polar bears at the international level.[81]

Article VI (1) of the Agreement on the Conservation of Polar Bears states, "[e]ach Contracting Party shall enact and enforce such legislation and other measures as may be necessary for the purpose of giving effect to this Agreement".[82] Thus, the Agreement on the Conservation of Polar Bears outlines framework goals and the contracting parties have the freedom (and the obligation) to advance these according to national law. Implementation of management frameworks for polar bear stocks takes place at the national and sub-national level, with varying approaches by country, as well as through bilateral agreements between countries.[83]

In the **United States**, polar bear stocks fall under the federal **US Marine Mammal Protection Act** (1972), and are managed through the Alaska Department of Fish and Game

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79 IUCN, 2002, pp. 29-30.

80 'Taking' is defined by the Agreement as hunting, killing and capturing. The full text of the Agreement can be found at http://pbsg.npolar.no/default.htm. Web-page of the IUCN Polar Bear Specialist Group. http://pbsg.npolar.no/, viewed 15 April 2008. IUCN, 2006, p. 70.

81 See http://pbsg.npolar.no/Misc/about.htm, viewed 16 May 2008.

82 See http://pbsg.npolar.no/ConvAgree/agreement.htm, viewed 16 May 2008.

83 Examples for national harvest regulation can be found at the IUCN PBSG, see http://pbsg.npolar.no/harvest-reg.htm, viewed 16 May 2008.

at the state level. Commercial polar bear taking is prohibited, yet there are no quotas or seasonal restrictions placed on indigenous polar bear taking for subsistence and handicraft purposes, and a small number of 'incidental' polar bear takes during oil and gas operations.[84]

Polar bear killing of any kind, on the other hand, was completely outlawed in the **Soviet Union** in 1956. But due to governmental and economic transitions after the fall of the Soviet Union, illegal hunting has become an increasing problem.[85]

The recent **United States/Russia Bilateral Agreement for the Conservation of Polar Bears in Chukchi/Bering Seas** (2000) complements the unilateral management structures. A unique agreement between indigenous groups in the United States and Canada – non binding in nature – has successfully prevented the depletion of polar bear stocks in the Beaufort Sea, while supporting the subsistence needs of the two populations.[86]

Polar bears in **Greenland** are legally harvested, while in Svalbard (**Norway**), polar bears are totally protected.[87] **Canada** has a system of quotas in place for polar bear harvesting, with an average of 500-600 bears taken per year.[88]

In general, polar bear stocks were considered to be stable in the Arctic, and the international agreement along with the national frameworks were deemed effective in conserving polar bear stocks. Recent climate change induced environmental effects have altered this outlook, however. Proceedings of the 14th Working Meeting of the IUCN Polar Bear Specialist Group reported that many populations were not at risk of decline over the next ten years, but were nevertheless threatened by contaminants, economic activities, the effects of climate change and the resulting decline of sea ice in the Arctic.[89] There is still extensive research to be done on certain sub-populations of polar bears, particularly in Greenland and Russia. Significantly, the United States Fish and Wildlife Service (USFWS) convened the polar bear authorities in all polar bear range states in 2007 for an informal discussion of the status of conservation of polar bears.[90] The summary from this meeting emphasized how polar bears are threatened particularly by the effects of climate change and the decline in sea ice and called for all parties to meet again in 2009.[91] The IUCN Polar Bear Specialist Group urged the USFWS to place the polar bear on the endangered species list due to the risks climate change poses to populations and their sea ice habitat.[92] The USFWS listed the polar bear as a threatened species under the Endangered Species Act in May 2008, but with the addition of a new rule that prevents stricter protection for the polar bear than is afforded under the Marine Mammal

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84 ACIA, 2005, p. 632.

85 USFWS Polar Bear, 2002, p. 4.

86 Brower, et al., 2002.

87 ACIA, 2005, p. 628.

88 Ibid., p. 626.

89 IUCN, 2006, pp. 34-5.

90 The polar bear range states are the United States, Canada, Russia, Greenland and Norway.

91 This 2009 meeting will most likely take place in Norway. Polar Bear Range States Meeting Summary, 2007, pp. 1-4.

92 Web-page of the IUCN Polar Bear Specialist Group http://pbsg.npolar.no/, viewed 16 April 2008.

Protection Act (MMPA). This restriction on protection may allow oil and gas industries to continue unabated in polar bear habitats.

2.2. Species-based approach: Beluga whale management

Beluga whales are currently listed on the IUCN Red List as threatened due to over-harvesting and increasing threats from shipping traffic and potential commercial exploitation by Russia.[93] Along with the other small cetaceans (e.g. narwhals, dolphins and porpoises), beluga whales are not included in the International Convention for the Regulation of Whaling despite interest from some members to the Convention.[94] Norway, Iceland, Greenland and the Faroe Islands manage beluga whales through the sub-regional North Atlantic Marine Mammal Commission, while the United States and Canada rely on co-management agreements between indigenous communities and federal agencies. Russia manages beluga whales through its State Fishery Committee of Russia.[95] Canada and Greenland have also signed a Memorandum of Understanding establishing the Joint Commission on the Conservation and Management of Narwhal and Beluga to address populations that migrate between the two countries, although each country is responsible for conservation and management of the species.[96]

In the US and Canada, there are multiple examples of **co-management agreements** between the federal government and local indigenous populations for the beluga and other marine mammals (e.g. Alaska Beluga Whale Committee and the Nunavut Wildlife Management Board in Canada). These agreements are non-binding, but are signed agreements between the parties that outline agreed principles of management and methods of communication and collaboration. Although some argue that these agreements do not transfer power to indigenous peoples, co-management has been widely applauded as an effective tool to increase user participation[97] and has resulted in increased knowledge about species health and distribution for hunters and scientists.[98]

However, it is also important to note that despite cooperation from both sides, co-management agreements may not halt the decline of species populations. A stark example of this is the continued decline of the Cook Inlet beluga whale population[99], despite agreement between the indigenous Cook Inlet Marine Mammal Council and the US National Marine Fisheries Service that have limited harvests to strict quotas ranging from 0-2 animals over the past seven years.[100] The US Fish and Wildlife Service is considering listing the Cook

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93 IUCN Red List, http://www.iucnredlist.org/search/details.php/6335/all, viewed 29 April 2008.

94 Web-page of International Whaling Commission (IWC), 2008, http://www.iwcoffice.org/conservation/smallcetacean.htm, viewed 29 April 2008.

95 Personal communication, Dr. Vladimir Zabavnikov at N.M.Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), 16 May 2008.

96 Reeves, et. al. (eds.), 2003, p. 48.

97 ACIA, 2005, p. 637.

98 Fernandez-Gimenez et al., 2006, p. 313.

99 The Cook Inlet Beluga Whale is a genetically distinct population of beluga whale.

100 NOAA, 2007, available online at: http://www.fakr.noaa.gov/newsreleases/2007/beluga041607.htm, viewed 14 April 2008.

Inlet Beluga Whale as an endangered species, with a decision planned no later than 20 October 2008.

2.3. Regional approach: Cooperation in the Barents Sea

The Barents Sea comprises Norwegian and Russian territories, their respective exclusive economic zones (EEZs) as well as a high seas region known as the Barents Loophole, which is outside of the EEZs of the two countries. Significant international cooperation has taken place in order to manage the Barents Sea including the multilateral fora, the inter-regional cooperation and **bilateral cooperation** between Norway and Russia. In addition, Norway has a management plan for the Barents Sea.

Bilateral agreements were agreed prior to multi-lateral agreements. In 1975, the **Soviet-Norwegian Fishing Commission** was established and fisheries agreements in the Barents Sea were agreed between Norway and the then Soviet Union. Since that time, Norway and Russia have worked together to manage fish stocks through the **Joint Norwegian-Russian Fisheries Commission**.[101] Currently, the biggest threat to fish stocks in the Barents Sea is illegal, unreported and unregulated (IUU) fishing.[102]

In 1988, the **Joint Norwegian-Russian Commission on Environmental Protection** was established as a bilateral, intergovernmental commission focused on environmental protection through control of economic activities (e.g. petroleum-related operations and oil refuelling from ship to ship).[103]

Following this bilateral cooperation, a multi-lateral agreement was formally established by the **Kirkenes Declaration** in 1993. The resulting **Barents Euro-Arctic Region** (BEAR) covers the Northern parts of Finland, Norway and Sweden as well as the North-West regions of Russia.[104] BEAR has a two-tiered regime that includes governance structures at both the national and regional levels: the **Barents Euro-Arctic Council** (BEAC), whose member states are Denmark, Finland, Iceland, Norway, Russia, Sweden and the European Union,[105] and the **Barents Regional Council for the Euro-Arctic Region** (BRC)[106], which includes input from thirteen counties. In addition to the national and sub-national entities that take part

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101 See UNEP, 2004, p. 29; Stokke, 2001, p. 242.

102 See the web-page of the Norwegian Ministry of Fisheries and Coastal Affairs: http://www.regjeringen.no/nb/dep/fkd/dep/politisk_ledelse/John-Erik-Pedersen/Taler-og-artikler/2008/fisheries-cooperation-in-the-north-a-nor.html?id=503822, viewed 15 April 2008.

103 See the web-page of the Norwegian Ministry of Environment: http://www.regjeringen.no/en/dep/md/Whats-new/News/2007/Norwegian-Russian-Cooperation-on-Environ.html?id=485128, viewed 14 April 2008.

104 Myrjord 2003, p. 239. The area covered geographically was – at the time the BEAR was founded – not part of the EU. However, with the EU accession of Sweden and Finland in 1995 the area now belongs in parts to the EU, "thereby enhancing the relevance of EU policies – both external and internal – in the region" (Myrjord 2003, 241).

105 Observer states are Canada, France, Germany, Italy, Japan, the Netherlands, Poland, the United Kingdom and the United States.

106 The Barents Regional Council involves input from thirteen counties or similar subnational entities, namely Norway (Nordland, Troms, Finnmark), Sweden (Västerbotten, Norrbotten), Finland (Lapland, Northern Ostrobothnia, Kainuu), Russia (Murmansk, Karelia, Arkhangelsk, Nenets, Komi).

in the two councils, representatives of the three indigenous peoples, the Sami, the Nenets and the Vepsians, serve in a working group of the Regional Council and have an advisory role to both councils.[107]

The BEAR's main objective is broad multilateral co-operation and aims at stability in a region which was characterised by tension and military rivalry.[108] Although the Kirkenes Declaration does not mention the marine environment – due to the maritime boundary dispute between Norway and Russia[109] – the Working Group on Environment Report from October 2005 addresses marine protection under its focus on the conservation of biological diversity, as well as highlights co-operation on oil and gas activities between Norway and Russia.[110]

The Norwegian-Russian Commission on Environmental Protection is not formally related to the BEAR even though Norway and Russia are both participants in BEAR. Furthermore, the Commission is considered to be structurally weaker than the BEAR, since it includes lower-level players than the representatives of the lead environmental agencies who are the partners in the BEAR.[111] Stokke observes that "the domestic clout of the Russian environmental bureaucracy sets a limit for what can be achieved through the bilateral Environmental Commission".[112] In addition, although BEAR faces financial constraints, in general it is considered inclusive and well-positioned to collaborate with other partnerships to promote a balance between economic and environmental goals and further pollution reduction at a larger scale.[113]

In March 2006 the **Norwegian** Government adopted a **management plan** for the Norwegian part of the Barents Sea ('**Barents Plan'**) which was approved by the Norwegian Storting (Parliament) in June 2006.[114] The aim of the Barents Plan is "to provide a framework for the sustainable use of natural resources and goods derived from the Barents Sea and the sea areas off the Lofoten Islands […] and at the same time maintain the structure, functioning and productivity of the ecosystems of the area".[115] The Barents Plan highlights the need to reduce and prevent pollution, a more careful approach to the expansion of petroleum activities, to strengthen the international cooperation on chemicals, the environmental risk resulting from pollution through maritime transport and to strengthen efforts to safeguard biodiversity.[116] There is no mention of BEAR, but the plan specifically seeks to strengthen the Joint Norwegian-Russian Commission on Environmental Protection and makes multiple

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107 The web-page of the Barents Euro-Arctic Council: http://www.beac.st/default.asp?id=344.

108 Stokke, 2000, p. 148.

109 Stokke, 2000, p. 124.

110 BEAC (Barents Euro-Arctic Council), 2005, p. 4 and p. 7.

111 Stokke, 2000, p. 139.

112 Stokke, 2000, p. 139.

113 See Stokke, 2000, p. 147.

114 Kroepelien 2007, p. 24.

115 Norwegian Parliament, 2006, p. 7. Available at http://odin.dep.no/md/norsk/dok/regpubl/stmeld/022001-040027/dok-bn.html, viewed 16 April 2008.

116 Stokke, 2000, p. 140.

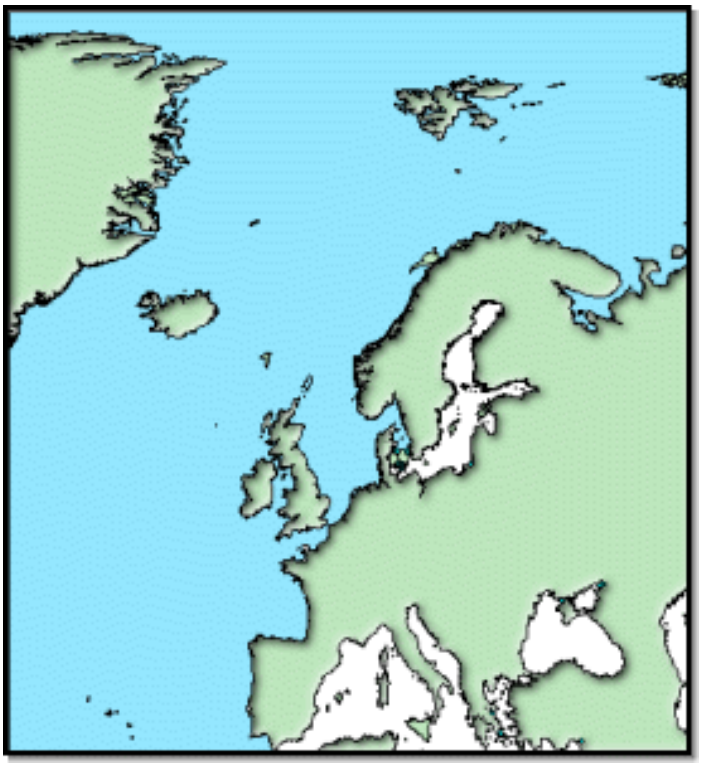
mention of the Joint Norwegian-Russian Fisheries Commission as well as the efforts of the European Commission and OSPAR Convention as relates to maritime policy.

2.4. Regional approach: Cooperation in the North-East Atlantic

The North-East Atlantic including the northern Atlantic and Arctic Oceans is governed in part by the 16 contracting parties to the **OSPAR Convention** for the Protection of the Marine Environment of the North-East Atlantic, as well as the six contracting parties to the **North East Atlantic Fisheries Commission (NEAFC)**. The NEAFC is one of 16 observers to the Convention, and a draft Memorandum of Understanding (MOU) with the North East Atlantic Fisheries Commission (NEAFC) will be considered by the OSPAR Commission in summer 2008.[117]

The OSPAR Convention combines the former Oslo (1972) and Paris (1974) Conventions on marine dumping and land based sources of pollution respectively. Annex V of the Convention is additional to the original conventions with its focus on the 'Protection and Conservation of Ecosystems and Biological Diversity of the Maritime Area'. A specific aim of Annex V is to apply an 'integrated ecosystem approach', although fisheries management and maritime transport are outside of its mandate. The OSPAR Maritime Area covers part of the Arctic marine area, as well as the Greater North Sea, the Celtic Seas, the Bay of Biscay/Golfe de Gascogne and Iberian waters, and the Wider Atlantic Ocean (see Figure 3).

Figure 3. OSPAR marine area extent.



(*Source: OSPAR.http://www.ospar.org/eng/html/welcome.html*)

[117] NEAFC, 2007.

There are 16 Contracting Parties[118] to the Convention that send representatives to the **OSPAR Commission**. The Commission can unanimously approve other governmental and non-governmental organisations to be official Observers to the Convention.[119] In 2006/2007 there were 6 governmental and 14 non-governmental observers. In addition, the Commission has signed three MOUs to enhance collaboration between OSPAR and the **International Council for the Exploration of the Sea (ICES)** for scientific information; the **European Environment Agency (EEA)** for compatibility in data collection and assistance with information dissemination; and the **UN Economic Commission for Europe (ECE)** to provide data and analysis of airborne pollutants from regional monitoring centres across the OSPAR area.

The goal of the OSPAR Convention is to prevent pollution and protect the marine environment from all human activities that impact the waters, except fisheries and shipping. Fisheries management lies within the mandate of the relevant Regional Fisheries Management Organisations (RFMOs), the EC and domestic authorities. OSPAR relies primarily on the International Maritime Organisation (IMO) – and observer to the Convention – for initiatives related to shipping.

The OSPAR Convention operates according to the precautionary principle, the 'polluter pays' principle and the best available techniques (BAT) and best environmental practices (BEP) to implement its five strategies. These strategies focus on marine biodiversity and ecosystems, eutrophication, offshore oil and gas industry, radioactive substances and hazardous substances. The marine biodiversity and ecosystems strategy represents a step beyond the pollution-prevention goal of both the Oslo and Paris Conventions. As defined in Annex V, it pursues an ecosystem-based approach through its focus on species, habitats and Marine Protected Areas (MPAs) on the one hand and impacts of human activities on the other.[120]

Climate change is a key focus of the OSPAR Convention. In 2007, the Commission took a Decision to allow CO_2 capture and storage (CCS) in geological formations under the seabed, as part of a growing list of global options to combat climate change.[121] At the same time, they banned CCS in the water column and on the seabed floor due to threats to the environment. In 2010, the OSPAR Quality Status Report will focus on the effects of climate change in the marine environment.

The OSPAR Convention attempts to create an inclusive, cross-sector approach to decision-making, however, it recognises that its targets are ambitious and difficult to achieve. There is also concern that the overlapping legal framework of the international, EU, national and local laws creates confusion that could inhibit positive action.[122] As the EU develops its **Marine**

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118 The 16 contracting parties of OSPAR are: Belgium, European Union, France, Iceland, Luxembourg, Norway, Spain, Switzerland, Denmark, Finland, Germany, Ireland, Netherlands, Portugal, Sweden, and United Kingdom.

119 See http://www.ospar.org/ for structure and decisions of the OSPAR Convention.

120 See the 2003 Strategies of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic available online at: http://www.ospar.org/eng/html/sap/welcome.html, viewed 16 April 2008.

121 OSPAR Commission Annual Report 2006/07 p. 9. Available online at: http://www.ospar.org/eng/html/welcome.html, viewed 13 April 2008.

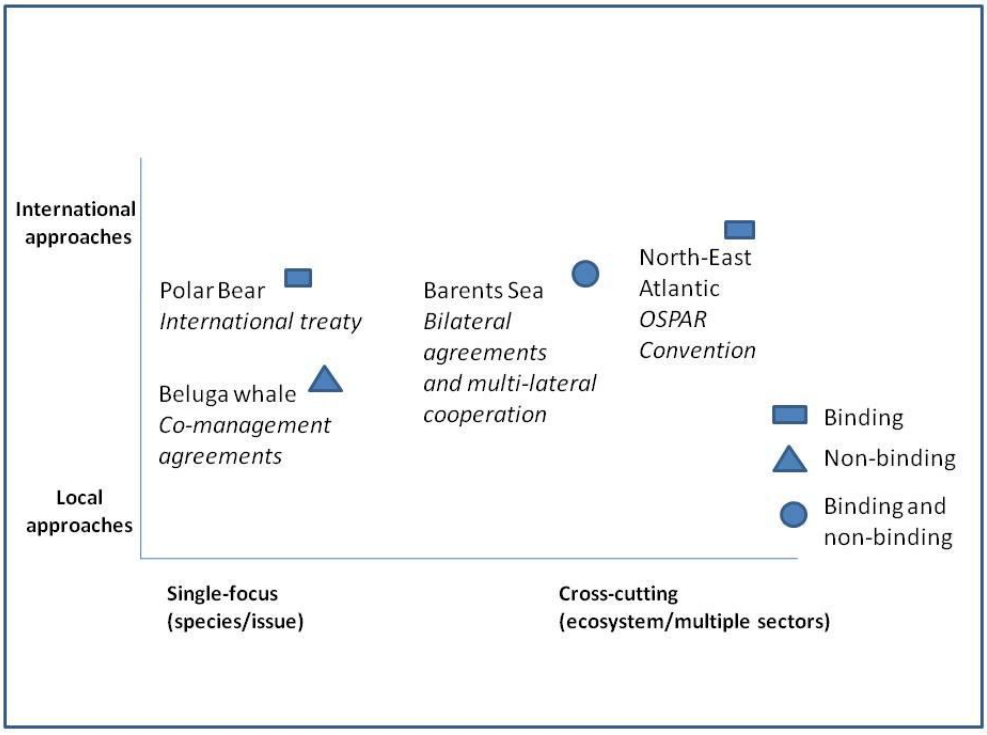
122 Ducrotoy, 1999, p. 314.

Strategy Directive, OSPAR is promoting its policy advances in light of a potential shift in need and structure of the Convention.

2.5. Summary of examples of Arctic governance

Approaches to environmental governance are often combined and difficult to separate from one example to the next. The four examples presented above provide a snapshot of the multiple approaches to governance in the Arctic. A useful way to think about the complexity of these and other existing approaches may be to place them on the continuum of governance approaches as presented below (see Figure 4). The continuum distinguishes between binding and non-binding approaches that target single to cross-cutting issues as well as the type of actors that range from local to international. Ultimately, improved coordination of these approaches could lead to a more formalised flexible approach to environmental governance in the marine Arctic at the global scale.

Figure 4: Continuum of approaches to environmental management with placement of four examples from the Arctic.



(Source: Ecologic)

As shown in the figure, both the management of the polar bear and beluga whale are single-species approaches. While the beluga whale co-management agreement involves local and national actors, the polar bear management regime is through a multilateral treaty. The polar bear treaty is legally binding, while beluga whale co-management consists of signed policy agreements that are non-binding. The Barents Sea management regime and OSPAR Convention in the North-East Atlantic both address multiple issues, with the OSPAR Convention taking an explicit ecosystem-based approach that covers all human activities that

affect the marine environment (except fisheries and shipping). The OSPAR Convention includes a slightly broader group of actors than the Barents Sea management regime, including observers that are unanimously approved. The Barents Sea is governed by overlapping soft law agreements of the Barents Euro-Arctic Region (BEAR) and bilateral agreements of the Joint Norwegian-Russian Fisheries and Environmental Commissions, while the OSPAR Convention is governed by a Commission that can also take legally binding decisions (subject to the acceptance of the contracting parties).

Using the spectrum as a communication tool is a clear way to distinguish between possible approaches and discuss options. A difference in perspectives on where the different examples should be placed is a way to facilitate discussion on possible future Arctic governance. In addition, this conceptual framework may help to move the principles of ecosystem-based management to a more practical level for practitioners and policy-makers.

3. PERSPECTIVES ON THE WAY FORWARD

In order to address the future challenges regarding governance of climate change related adaptation needs in the Arctic marine area, the literature suggests different ways forward as well as areas for further focus. In the following section a summary of expert perspectives will be provided of the current approaches and their strengths and weaknesses in the light of foreseeable changes. This description of the *status quo* will be followed by an overview of recommendations discussed in policy and science on which direction and ambitions are appropriate and realistic. To conclude, four key questions will be posed to serve as a starting point to identify transatlantic policy options for adaptation in the Arctic marine area.

Identifying general shortcomings in Arctic environmental governance – independent of the transatlantic aspect – will help to identify areas for transatlantic action. As a result of the Arctic TRANSFORM project, policy options will be developed related to adaptation to the impacts of climate change in the Arctic marine environment. The following paragraphs intend to animate discussion; they do not intend to give a complete overview of all opinions and arguments in this context.

3.1. Strengths and weaknesses of the current approach

While the following cited experts agree that the current state of governance in the Arctic is more or less inadequate for tackling future challenges in the Arctic marine environment and that adaptation is therefore definitely needed, they do have different opinions on how and to which extent the governance framework needs to change in light of the future impacts of climate change.

Table 4: Expert views on strengths and weaknesses of Arctic governance (including environmental governance)

Theme	Weaknesses (-) and Strengths (+)
General	– There is a lack of specific commitments, targets and timetables for action in the regional regime – International responses to Arctic threats are fragmented and weak[123] + "Current governance structure open to new currents arising within the mainstream of world affairs"[124]
Actors	– Gaps exist in the integration of indigenous peoples into the legal regime of most Arctic states (despite indigenous rights and land claims)[125] – There are gaps regarding the sharing of benefits from resource activities (fishing, mining) with indigenous as well as local communities[126] + Non-state actors have the opportunity to wield influence in intergovernmental settings[127]
Environment	– Inadequate control of environmental impacts of mining[128] – Biodiversity protection is incomplete [129] – There is little opportunity in the current framework to consider the Arctic from an ecosystem-management perspective[130] + AMAP examines pathways and levels of hazardous contaminants, including POPs, heavy metals, radionuclides and hydrocarbons; examines their effects on human health and Arctic flora and fauna; and assesses impacts of climate change[131]
Financial resources	– The Arctic Council has too limited financial resources to go beyond a 'talk and study' mentality when addressing the protection of the Arctic environment[132] – AMAP (an Arctic Council WG) has only a modest budget (Arctic Council WG) to coordinate the study of Arctic contaminants[133] – "The Regional Programme for the Protection from land-based pollutants [contains] few concrete actions and lacking guaranteed budget"[134] – There is a chronic under-funding of the regional Arctic regime (e.g. the Arctic Council)[135]
Enforcement	– Unenforceability of the regional regime is a problem[136] – Several gaps in the UNCLOS have to do with the widespread non-application of the provisions, because of general principle of sovereign immunity of ships and aircraft[137] – EPPR (an Arctic Council WG) does not have the ability to act personally[138] – "Marine conservation legislation is not always […] adequately enforced"[139]

123 Rayfuse, 2008, p. 7.

124 Young, 2002, p. 6.

125 Nowlan, 2001, p. 5.

126 Nowlan, 2001, p. 5.

127 Young, 2002, p. 6 and p. 11.

128 Nowlan, 2001, p. 5.

129 Nowlan, 2001, p. 5.

130 WWF, 2008, p. 23.

131 Stokke, 2007, p. 405.

132 VanderZwaag et al., 2002, p. 167.

133 VanderZwaag et al., 2002, p. 148.

134 VanderZwaag et al., 2002, p. 167.

135 Nowlan, 2001, p. 5.

136 Nowlan, 2001, p. 5.

137 Vidas, 2000, p. 50.

138 VanderZwaag et al., 2002, p. 149.

139 VanderZwaag et al., 2002, p. 152.

As one example of the discrepancies between experts' opinions, *Nowlan (IUCN Environmental Law Programme)* sees numerous gaps "...in the Arctic environmental legal regime [in relation] to specific environmental issues…"[140], while on the other hand *Young (Institute of Arctic Studies of Dartmouth College, Hanover, USA, now at the University of California at Santa Barbara)* is optimistic and emphasises the opportunities and flexibility of the current situation.[141] This particularly concerns the involvement of non-state actors. Overall, the predominant issues that have been raised by the cited experts (below) range from (1) the lack of financial resources for the implementation of initiatives,[142] (2) the non-binding nature of many instruments[143] to (3) major gaps in the coverage of relevant issues.[144] The table below summarises a number of prominent strengths and weaknesses mentioned by experts regarding current governance of the Arctic, including governance of the Arctic marine environment.

3.2. Expert recommendations

The above cited experts have emphasised the shortcomings of current structures with the intention of using it as a foundation to determine recommendations on how to improve the governance structure of the Arctic.

They have all formulated more or less explicit recommendations, which are presented in the table below. Even though not all recommendations are specifically addressing governance of the Arctic marine environment or even adaptation issues, they could – if realised – have a considerable impact on the marine environment.

Table 5: Expert recommendations on Arctic governance (in alphabetical order)

Author / source	Expert recommendation(s)
AHDR (Arctic Council initiative)[145]	"[…] **Willingness to set aside conventional wisdom**, such as the idea that what is needed in the Arctic is a region-wide and legally binding regime of the sort operating in the south polar region under the terms of the Antarctic Treaty System". "Discussion [is needed on …] the adequacy of current resource governance, **whether existing frameworks are flexible, resilient and robust enough** to deal with the issues that climate change will bring."
Chapin et. al. (University of Alaska Fairbanks, USA)[146]	The approach to manage Arctic change should "…: • **identify externalities** (hidden costs and benefits) **contributing to Arctic change**; • as well as **reduce the pressures for change**; • explore **opportunities for desirable ecological** and social **change**; • and **identify institutions** poised to implement policies at appropriate scales." (See also figure 4 below)
Koivurova (Arctic Centre, Finland)[147]	"It is … [the] gradual shift to issues that can be managed by the Arctic States themselves that makes **the creation of an Arctic treaty necessary**."

140 Nowlan, 2001, p. 56.

141 Young, 2002, p. 5.

142 Nowlan, 2001, p. 5; VanderZwaag et al., 2002, p. 147.

143 Nowlan, 2001, p. 5; Rayfuse, 2008, p. 7.

144 Nowlan, 2001, p. 5; Rayfuse, 2008, p. 7; Vidas, 2000, p. 55.

145 Arctic Human Development Report (AHDR), 2004, p. 121.

146 Chapin et al., 2006, p. 200.

147 Koivurova 2008, pp. 22-3.

	"One possible way forward is to **choose a framework treaty** which: • **formalizes** the current membership and decision-making procedure of the **[Arctic] Council**; • adds certain **guiding principles related to environmental protection and sustainable development** to the treaty; • and gives **a mandate to the Council** to adopt protocols **to counter threats to environmental protection and challenges to sustainable development** on the basis of scientific assessment."
Nowlan (IUCN Environmental Law Programme)[148]	"In addition to incorporating key principles, the topics that could be covered by an Arctic sustainability agreement include: • **building on the successes of the ATS [Antarctic Treaty System],** • and the **adoption of rules similar to those found in the Annexes to the Madrid Protocol**". "**A regional agreement could give legal force to the sustainable development principles** articulated in the Sustainable Development Framework to guide the work of the Council and all its associated bodies. These principles could draw on work done by many others, such as from indigenous organizations." **Arguments against an Arctic Treaty** at this moment include "[…:] • The **time and expense of formal treaty negotiations** could act as **a barrier** to continuation of soft law development; • **A formal new organization**, such as a treaty secretariat, could be **expensive** to operate; • **A comprehensive regime** can be **difficult to obtain support** for, and consequently **difficult to implement**. • Also, **many international treaties are already taking the special needs of the Arctic into account** ... Pursuing Arctic specific goals in existing global regimes may be faster, less expensive, and more effective for the environment".
Rayfuse (University of New South Wales, Australia)[149]	• "The international community should […] **utilize the current IPY** [international polar year] … to pledge to […] better conservation and management [of the Arctic marine environment]. • This can be accomplished […] with a commitment to **multilateral approaches** incorporating the best and latest knowledge and standards for conservation and sustainable management of marine biodiversity. • […] An outcome of this IPY should be the **adoption of an international agreement**, which recognizes the **legitimate interests of non-Arctic States** in the conservation and management of marine biodiversity in the central Arctic Ocean ABNJ" (Areas Beyond National Jurisdiction).
Young (Dartmouth College, USA)[150]	• Reconfigure the International Arctic Science Committee (IASC) to give it both a mandate and the capacity to engage in assessment and monitoring activities pertaining to the shared natural resources and ecosystems of the Arctic. • Forge **a strong alliance among local, sub-national, and national constituencies** in the region in order to maximize the effectiveness of the voice of the Arctic in global forums. • Establish an Arctic Environment and Sustainable Development Fund (AESDF) endowed with the **material resources needed to supplement national resources** available for the operation of regimes dealing with environmental protection and sustainable development in the Arctic. • **Create a Commission on Arctic Sustainable Development** (CASD)"
WWF Arctic[151]	"We need a new approach, which includes: • thinking about **a solid Arctic Treaty** • and **a multilateral governance body** … This is **the only way to ensure the implementation of sustainable development regimes** and help the Arctic adapt to the severe impact of climate change and ultimately stabilize the world's climate."

148 Nowlan 2001, pp. 60-1.

149 Rayfuse 2008, pp. 12-3.

150 Young, 2002, p. 3.

151 Dr. Neil Hamilton, director of WWF Arctic, as cited by Koivurova, 2008, p. 20.

Chapin presents the following table to support his point that institutions should be identified that are poised to implement policies at appropriate scales, which connects specific policies regarding the environment to their appropriate scales and institutions. Figure 5 shows how the necessary environmental protection measures are broken down to these different scales and attributed to the appropriate governance level. Thereby, Chapin makes clear that different issues should be dealt with at different levels also in future, regardless of the potential emergence of an Arctic Treaty.

Figure 5: Policies to enhance Arctic resilience and to reduce vulnerability

Policy	Appropriate scales	Appropriate institutions
Reduce greenhouse gas emissions Educate global population about arctic change Implement international protocols Internalize costs of climate change Foster market mechanisms Foster technological innovation	Global to national	International agreements (e.g., Kyoto protocol) Market mechanisms (e.g., carbon credit exchanges) Media and public education
Designate Marine Protected Areas Zone flexibly for specific uses Regulate sources of biotic change (over-fishing, ballast water discharge) Link terrestrial and marine reserves Co-manage to sustain resources and meet community needs	Pan-arctic	Arctic Council
Designate co-managed reserve networks Connect ecologically distinct habitats Manage change rather than species Co-manage natural resources (greater stakeholder involvement)	National/regional/local	Resource management agencies Local communities
Foster economic adaptation to change Incentives for economic diversification Reduce subsidies for inefficient activities Tax externalities that reduce ecosystem services Retain resource rents locally (enhance capacity-building and adaptation)	National/regional/local	National/regional governments Local communities

Source: Reproduced from Chapin et al., 2006, p. 200.

3.3. Concluding remarks and questions for discussion

As a possible starting point for further reflection and discussion on the particular needs and opportunities that currently exist regarding environmental governance, the following questions may provide a useful starting point:

- **Uniqueness**: What are the unique opportunities and threats in the Arctic marine area that could guide the adaptation of governance regimes in light of future changes?
- **Content**: Where are the gaps and overlaps in the current governance structure?
- **Approaches**: What are the advantages and trade-offs of the various possible approaches? (e.g. flexibility versus enforceability)
- **Transatlantic contribution**: How can transatlantic policies contribute to the adaptation of governance in the marine Arctic to climate change?

To conclude, this paper highlights the complexity of Arctic environmental governance from multiple perspectives. It is an attempt to describe the landscape of governance approaches in place in the Arctic to provide a starting point for discussion regarding the future of environmental governance in the marine Arctic.

Many of the existing institutions and governance structures were developed under political and environmental circumstances that were vastly different from today's reality. The Arctic is undergoing drastic changes that will spark unprecedented activity in the region. A rethinking of existing governance structures is required to appropriately address the newly emerging situation.

ANNEX: GLOBAL TREATIES, CONVENTIONS AND AGREEMENTS RELEVANT TO ARCTIC MARINE ECOSYSTEMS

International Convention on the Regulation of Whaling (1946). This species-specific convention sets harvesting quotas for whaling and is monitored by the International Whaling Commission.

Full text: http://www.iwcoffice.org/commission/convention.htm#convention

Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (1969). This convention is administered by the International Maritime Organisation and establishes the right of a coastal state to reduce the risk of danger to its coastline by taking action on the high seas with regard to oil pollution.[152]

Full text: http://www.imo.org/Conventions/contents.asp?topic_id=258&doc_id=680

Ramsar Convention on Wetlands (1971). This convention establishes a framework for the conservation of wetlands.

Full text: http://www.ramsar.org/key_conv_e.htm

Convention for the Protection of World Cultural and Natural Heritage (1972). Paves the way for the identification of areas to be placed on the World Heritage List, the designation thereof entitles the area to increased protection and conservation efforts

Full text: http://whc.unesco.org/en/conventiontext/

Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (1972). This convention, also known as the London Convention, regulates dumping at sea through the prohibition of the dumping of a number of hazardous wastes, requires a special prior permit for the dumping of other wastes, and a general prior permit for dumping at all. It prohibits dumping of low level radioactive waste at sea. The 1996 Protocol (entry into force 2006) was intended to replace the 1972 Convention and represents the introduction of a more precautionary approach to the regulation of dumping at sea and specified the materials that could be dumped at sea in Annex I. The 2006 Amendment to the 1996 Protocol regulates carbon capture and storage in sub-seabed geological formations.[153] Enforcement of this convention is mostly through the flag state.[154]

Full text: http://www.imo.org/Conventions/contents.asp?topic_id=258&doc_id=681

International Agreement for the Conservation of Polar Bears (1973). This agreement is species-specific and monitored by the International Union for Conservation of Nature (IUCN). It remains to this day the sole international treaty that exclusively applies to the Arctic region.[155] With this agreement, Canada, Denmark, Norway, the USSR (now Russia) and the

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[152] The web-page of IMO: http://www.imo.org/Conventions/contents.asp?topic_id=258&doc_id=680, viewed 7 April 2008.

[153] The web-page of IMO: http://www.imo.org/Conventions/mainframe.asp?topic_id=258&doc_id=681, viewed 7 April 2008.

[154] Rothwell, 2000, p. 63.

[155] Pagnan, 2000, p. 471.

U.S. protect polar bear habitats with exceptions for research and subsistence uses of indigenous peoples.

Full text: http://pbsg.npolar.no/ConvAgree/agreement.htm

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1973). This convention regulates the trade of currently endangered species and those that could be threatened if no action is taken. It requires a permit for the export and import of the enumerated species in the convention. Certain species, if designated by one of the parties to the convention, may not be traded at all.

Full text: http://www.cites.org/eng/disc/text.shtml

International Convention for the Prevention of Pollution from Ships (MARPOL) (1973/8). This convention is administered by the International Maritime Organisation (IMO) and is the main international convention for preventing pollution of the marine environment by ships. It addresses oil, chemicals, harmful substances in packaged form, sewage, garbage and air pollution. MARPOL also designates 'special areas' and 'particularly sensitive sea areas' that are potentially more vulnerable to pollution from oil, garbage, sulphur emissions and therefore require more stringent protection measures. Antarctica was designated a 'special area' in a 1990 amendment to MARPOL but the Arctic has no areas with this designation.[156]

Full text: http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258

International Convention for the Safety of Life at Sea (1974). This convention is administered by the International Maritime Organisation and sets down basic safety requirements and regulates safety of merchant ships, including the construction of ships, the transport of hazardous and nuclear materials. The convention has evolved over time and now includes a number of amendments regarding safety regulations.[157]

Full text: http://www.imo.org/Conventions/contents.asp?topic_id=257&doc_id=647

Convention on Long Range Transboundary Air Pollution (1979). This convention aims to reduce long rand transboundary air pollution. It encourages research, information exchange and monitoring of transboundary air pollution and in addition the creation of policies and regulations at a national level to advance the aim.

Full text: http://www.unece.org/env/lrtap/full%20text/1979.CLRTAP.e.pdf

Convention on the Conservation of Migratory Species of Wild Animals (CMS) (1979). This convention is a framework for agreements on migratory animals. The convention promotes research of migratory animals, protection of migratory animals that are endangered, and agreements regarding the conservation of migratory animals.

Full text: http://www.cms.int/documents/convtxt/cms_convtxt.htm

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156 The web-page of IMO: http://www.imo.org/Conventions/contents.asp?doc_id=678&topic_id=258, viewed 7 April 2008.

157 The web-page of IMO: http://www.imo.org/Conventions/contents.asp?topic_id=257&doc_id=647, viewed 7 April 2008.

United Nations Convention on the Law of the Sea (1982). The convention designates the right of coastal states to establish an exclusive economic zone (EEZ) that extends 200 nautical miles from its coast, in which the coastal state has control of resource management and environmental protection. Control of resources on the continental shelf is also designated to coastal states. Section 5 of the Convention is dedicated to international rules and national legislation regarding the protection of the marine environment from pollution.

Full text: http://www.un.org/Depts/los/convention_agreements/texts/unclos/unclos_e.pdf

Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986). This convention establishes international co-operation in the event of a nuclear accident or radiological emergency. Countries may solicit assistance from other countries in order to deal with the emergency.

Full text: http://www.iaea.org/Publications/Documents/Infcircs/Others/infcirc336.shtml

Convention on Early Notification on a Nuclear Accident (1986). This convention came into force after the Chernobyl accident of 1986 and requires countries notify other countries in the event of a nuclear accident that may affect another country, providing information to allow adequate assessment of the problem.[158]

Full text: http://www.iaea.org/Publications/Documents/Infcircs/Others/infcirc335.shtml

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989). This convention recognises the threat to humans and the environment that transboundary hazardous wastes can pose. The main aim is to minimise hazardous waste production and encourages the disposal of hazardous wastes near the site of production. It establishes that each country has the right to deny the entry or disposal of hazardous wastes on their territory and requires the exchange of information between countries on transboundary movements of hazardous wastes in the form of a movement document and also requires national reporting of hazardous waste production and movement.[159]

Full text: http://www.basel.int/text/con-e-rev.pdf

International Convention on Oil Pollution Preparedness Response and Cooperation (1990). This convention is administered by the International Maritime Organisation (IMO) and requires countries who are parties to the convention to outline measures for manage oil-related incidents and assist other parties if there is a spill. In addition, it establishes a number of requirements that ships must fulfil, including carrying an oil pollution emergency plan and reporting incidents.[160]

Full text: http://www.imo.org/Conventions/contents.asp?topic_id=258&doc_id=682

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158 The web-page of IAEA: http://www.iaea.org/Publications/Documents/Conventions/cenna.html, viewed 7 April 2008.

159 Basel Convention. The web-page of the Basel Convention: http://www.basel.int/, viewed 7 April 2008.

160 The web-page of IMO: http://www.imo.org/Conventions/contents.asp?topic_id=258&doc_id=682, viewed 7 April 2008.

Convention on Biological Diversity (1992). This conventions calls for conservation and protection of biodiversity and has since formally implemented an ecosystem-based approach to environmental management. In addition, it emphasises the establishment of protected areas.

Full text:"http://www.cbd.int/doc/legal/cbd-un-en.pdf"

United Nations Framework Convention on Climate Change (1992). This convention aimed to reduce greenhouse gas emissions in order to address climate change. The Kyoto Protocol to this convention provides legally binding targets for reductions in emissions.

Full text: http://unfccc.int/resource/docs/convkp/conveng.pdf

United Nations Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (1995). This convention recognises the threat to the marine environment posed by land-based activities and acknowledges the need for international, regional and national cooperation in this realm. It aims to take action to deal with land-based activities that may result in the degradation of the environment, particularly through the development and review of national programmes for action.

Full text: http://www.gpa.unep.org/

FAO Code of Conduct for Responsible Fisheries (1995) and International Plan of Action (2001). The FAO Code of Conduct and International Plan of Action are international non-binding guidelines and plans for fishery management, conservation and protection.

Full text of Code of Conduct: http://www.fao.org/DOCREP/005/v9878e/v9878e00.htm

Full text of International Plan of Action:
http://www.fao.org/DOCREP/003/y1224e/y1224e00.HTM

Stockholm Convention on Persistent Organic Pollutants (2001). This convention aims to eliminate certain pollutants and regulate the import of others in order to protect human health and the environment from persistent organic pollutants.

Full text: http://www.pops.int/documents/convtext/convtext_en.pdf

The United Nations Fish Stock Agreement (2001). This convention aims to conserve and provide for sustainable use of straddling and highly migratory fish stocks in international waters.

Full text: http://www.un.org/Depts/los/convention_agreements/texts/fish_stocks_agreement/CONF164_37.htm

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