13 August 2010

The Arctic Ocean Review

DRAFT – for comments only

Chapter 1: Introduction

Chapter 2. The Arctic Marine Ecosystem

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Chapter 1: Introduction

1.1 Background

In a global perspective, the Arctic marine environment is generally clean, with low levels of pollution. A number of the marine ecosystems of the high north are highly productive, sustaining major fisheries and providing livelihoods for the people living in the Arctic. The Arctic marine environment is however also subject to a number of stressors, including climate change and pollution on the one hand, and increasing economic activities on the other.[1]

People live and work in the Arctic. Indigenous people in particular are in many regions of the Arctic an integral part of the marine ecosystems, which are important to their livelihood and well-being.

The stewardship of the Arctic marine environment is a particular responsibility for the Arctic states. The Arctic Council has an on-going engagement with the Arctic marine environment through a number of assessments and projects, and is at the forefront of these emerging issues through the development of a number of in-depth reports and assessments, such as the State of the Arctic Environment Reports (1997-2009), the Arctic Climate Impact Assessment (2004), the Arctic Marine Shipping Assessment, (2009) and the Arctic Oil and Gas Assessment (2008). The Arctic Council has also developed guidelines for offshore oil and gas activity (2009) and best practices in ecosystem-based oceans management (2009). Work on new or enhanced instruments relevant to the management of the marine environment (search and rescue, polar operations) has been initiated.

In 1996 the Protection of the Arctic Marine Environment Working Group (PAME) produced the first report on the Arctic marine environment.[2] This was followed up upon with the adoption of the Arctic Marine Strategic Plan in 2004.[3] The Plan promotes the implementation of applicable international and regional commitments as a strategic action, and asks for periodic

[1] ACIA 2005, AMAP 2009
[2] Working Group on the Protection of the Arctic Marine Environment 1996: Report to the Third Ministerial Conference on the Protection of the Arctic Environment, 20-21 March 1996, Inuvik, Canada.
[3] Arctic Marine Strategic Plan, available at: http://web.arcticportal.org/pame/amsp

review of the status and adequacy of international/regional agreements and standards that have application in the Arctic marine environment. PAME as well as other working groups in the Arctic Council has on-going projects relevant to the management of Arctic marine environment, including the CAFF Biodiversity Assessment,[4] the AMAP Snow, Water, Ice and Permafrost in the Arctic (SWIPA)[5] project, and the PAME Ecosystem Approach project.[6]

Because of increasing economic activities from inside as well as outside the region, climate change and pollution, concerns for the Arctic marine environment have been growing. It is therefore timely to undertake a review of global and regional measures (voluntary and mandatory) that are relevant to the conservation and sustainable use of the Arctic marine environment, as well as the relevant activities of the Arctic Council.

The Arctic Ocean Review is encouraged in particular by the following:

> The Arctic Marine Strategic Plan, adopted by the Arctic Council in 2004, which provides the foundation for both the Arctic Council and PAME's mission and objectives. It sets out a range of actions that can be undertaken by the Arctic Council through its member states and subsidiary bodies, among them to "Periodically review the status and adequacy of international/regional agreements and standards that have application in the Arctic marine environment, new scientific knowledge of emerging substances of concern, and analyze the applicability of a regional seas agreement to the Arctic" (Strategic Action 7.3.4).
>
> The common objectives and priorities for the Norwegian, Danish and Swedish chairmanships of the Arctic Council (2006-2013) has given high priority to the theme of integrated management, as well as ensuring a sustainable and ecosystem- based approach to resource development in the Arctic.
>
> Objective II of the PAME Work Plan 2009-2011 asks PAME to "Determine the adequacy of applicable international/regional commitments and promote their implementation and compliance".
>
> Commitments by the global community to sustainable development and protection of marine biodiversity and the marine environment through the application of the ecosystem approach and integrated coastal and ocean management.

In April 2009, the Arctic Council ministers approved a proposal by Pame to conduct and Arctic Ocean Review (AOR) as a follow-up to the 2004 Arctic Marine Strategic Plan, which states that the Council shall "Periodically review the status and adequacy of international/regional agreements and

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[4] http://caff.arcticportal.org/index.php?option=com_content&view=frontpage&Itemid=156
[5] http://amap.no/swipa/press2009/SWIPA%20Phamflet%20Final%20Version.pdf
[6] http://www.pame.is/ecosystem-approach

standards that have application in the Arctic marine environment…. " (Strategic Action 7.3.4).

1.2 Objectives

The overall objective of the AOR is to provide guidance to Arctic Council Ministers as a means to strengthen governance in the Arctic through a cooperative, coordinated, and integrated approach to the management of Arctic marine environment. The AOR will also play an important role in demonstrating Arctic States' stewardship efforts in the Arctic.

Phase I Objectives (2009-2011):

- Compile information on global and regional measures that are relevant to the conservation and sustainable use of the Arctic marine environment;

- Survey the status and trends in the Arctic marine environment in cooperation with other working groups of the Arctic Council;

- Disseminate compiled information through communication products/tools, and conduct outreach to both communicate efforts and obtain input;

- Prepare a compilation document that will review global and regional measures that are relevant to the conservation and sustainable use of the Arctic marine environment and identify and highlight potential weaknesses. (This document will form the basis of discussion for the technical workshop); and,

- Develop a status report for Arctic Council Ministers.

On the basis of the work in phase I, a phase II of the project (2011-2013) will

- Take into account major new developments;

- Analyze potential weaknesses and/or impediments in global and regional instruments and measures to achieving environmental, economic and socio-cultural outcomes;

- Outline options to address potential weaknesses and/or impediments; and,

- Produce a final AOR Report to Arctic Council Ministers that will: summarize potential weaknesses and/or impediments in the global and regional instruments and measures for management of the Arctic marine environment; outline options to address these weaknesses and/or impediments; and, make agreed recommendations to help ensure a healthy and productive Arctic marine environment in light of current and emerging trends.

Descriptions of international law, including as reflected in the 1982 Law of the Sea Convention, are included for the benefit of the reader and are not intended to constitute interpretations.

1.3 Scope and approach of the project

The Arctic Ocean Review will not initiate a new assessment, but produce a report on the global and regional instruments (mandatory and voluntary) relevant to the conservation and sustainable use of the Arctic marine environment. The report will also include recent and ongoing activities of the Arctic Council. In its first phase (2009-2011), the project will survey the status and trends in the Arctic marine environment in cooperation with other working groups of the Arctic Council. Based on a thorough understanding of the status and trends, Phase I will then review relevant, existing global and regional instruments that apply to the Arctic marine environment.

Phase II (2011 – 2013) of the project will further develop the work in Phase I with an emphasis on areas where the Arctic Council can effectively add value to the existing international mechanisms for the Arctic marine environment.

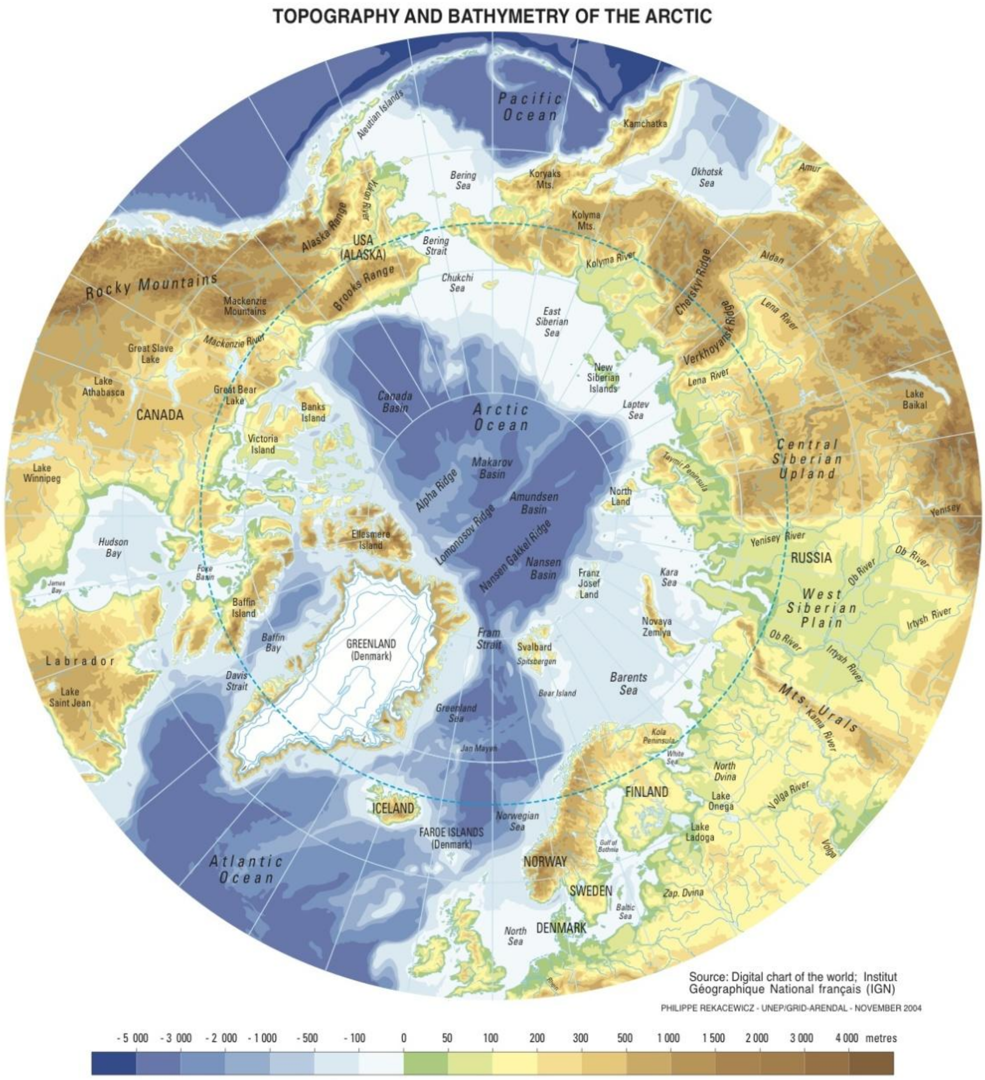
There is no agreed definition or understanding of the geographical extent of the Arctic. It is however important to be specific when using the term, as the nature of the challenges and issues facing us are very different from region to region in the Arctic.

There are several approaches to defining the Arctic: by scientific criteria, by latitude, and by political identification. The common criterion in the first category is temperature. Traditionally, the 10º C in July isotherm has been used to define the Arctic (see *map x*). A common definition by latitude is the region north of which one experience at least one day 24 hour sunlight or at least one day with the sun below the horizon (“the Arctic Circle”], at 66° 33′ 39″ (or 66.56083°) north.

A third approach is where countries define their Arctic as a component of their territory.[7] This is the approach used by several working groups in the Arctic Council, and it includes a wider area than the first definition given above. This approach also has scientific merit, in that the Arctic is affected by natural and human-driven processes in the south, while processes in the

[7] The Offshore oil and gas guidelines, annex A, p. 77.

Arctic affect nature and societies to the south.



Source: Arctic Marine Strategic Plan 2004

In this project we use the latter understanding of the Arctic as the basis for our work. The project includes the territories of eight Arctic states: Russia, the United States, Canada, Denmark/Greenland, Iceland, Norway, Finland, and Sweden. In the marine area the project covers the central Arctic Ocean,[8] and in addition, the surrounding seas: the Bering Sea, the East Siberian Sea, Chukchi Sea and Beaufort Sea, the Davis Strait, Baffin Bay and Labrador Sea, the waters around Iceland and northern parts of the Norwegian Sea, the Barents Sea, the Kara Sea, and the Laptev Sea. The oceans and seas included in this definition are altogether xx miliion km^2 and are referred to as the "Arctic marine environment ".

The Arctic marine environment consists of many ecosystems. In some contexts, including in the Arctic Council, reference is made to these ecosystems, as for example Large Marine Ecosystems (LMEs), Large Ocean Management Areas (LOMAs), or Marine Management Plan Areas.

Some international instruments refer to specific areas and therefore have specific definitions of the Arctic.

The term "instrument" is used in a general sense, including legally binding agreements as well as non-binding arrangements. "Measures" are provisions of instruments that states can act on. Often, instruments have associated regular or ad hoc processes that may produce measures. Where relevant, such processes are referred to. In addition, the report identifies science arrangements of relevance to the Arctic Ocean Review.

1.4 Dimensions and limitations of the Arctic Ocean Review

One of the major, global developments over the last century is the increasing role of international law in relations between countries. Nowhere is this more evident than in the area of the environment, where the last decades have witnessed a growth from only a handful to more than 400 multilateral treaties,[9] as well as an increasing number of voluntary arrangements.

International instruments are the product of negotiation between countries (and sometimes other entities) that frequently have diverse interests. Instruments will therefore often be perceived as having "inadequacies" or "gaps". The question of how to strengthen them can be addressed in different ways. The approach chosen here is to ask whether the instruments in question address the problem at hand and have a geographical scope and membership that cover it. Four dimensions of the instruments are addressed: Geographical scope, membership, objectives, and functional scope or themes covered by the instrument in question.

One of the objectives of the Arctic Ocean Review phase I is to "identify and highlight weaknesses" of existing instruments. This begs the question of how "weaknesses" is to be understood and measured. We address this through four questions:

1. [8] See International Hydrographic Organization (1953) "Limits of Oceans and seas". http://www.iho-ohi.net/iho_pubs/standard/S-23/S23_1953.pdf
[9] Source

First, is the *geographical scope* of the instrument adequate? Many of the multilateral instruments referred to above apply also in the Arctic marine environment. Some are global, like the 1982 Law of the Sea Convention. Others have a more limited, regional scope but cover more than the Arctic. An example of the latter is the 1992 OSPAR Convention on the marine environment in the Northeast Atlantic. A third category includes instruments, including bilateral ones, that apply only or primarily in the Arctic or parts of it.

Second, are the relevant states party to the instrument? With "*membership*" we simply refer to which states are party to an instrument. As a general rule, treaties are only binding upon parties.[10] International agreements are implemented at the domestic level through national legislation and other measures. The Arctic marine environment is largely under national jurisdiction. An area of xx km2 in the central Arctic Ocean is high seas, as are two areas in the Northeast Atlantic and an area in the North Pacific.

Third, are the objectives of the instrument clearly articulated and adequate? The objective(s) of an instrument indicates its thematic scope, which aspects of a given phenomenon that is addressed. However, objectives as defined in treaties may often be general and need further clarifications to be operational and possible to evaluate. Also, there are instruments without objectives specified.

Finally, the functional scope of an instrument indicates the measures (in the sense of "tools") states can use in addressing a certain issue. In relation to for example pollution issues, functional scope could include mechanisms to assess the problem, provisions for regulations or standard setting, and review and enforcement. The latter is specifically addressed where relevant.

By examining how the instruments that apply for a particular problem addresses these questions, we can at least say something about adeqacy and weaknesses and how existing mechanisms can be strengthened. A strong instrument (or suite of instruments) is one that covers the problem in question geographically, has all relevant states as parties (or that they cooperate), has objectives that are specific and adequate relative to the problem, and has a functional scope that provides the necessary tools to deal with the problem at hand.

An inadequate instrument (or suite of instruments), on the other hand, is one where the geographical scope does not match the problem at hand, where membership does not include relevant states, where objectives are unclear and inadequate, and the functional scope does not provide the management tools required.

Some limitations to this approach should be noted:

[10] There are however cases where non-parties comply with an agreement without being a party. Also, states can comply with customary international law.

- The resolution of problems in the realm of the environment also depends upon a number of non-legal factors, such as the availability and quality of science, and the organization of decision-making processes.

- International instruments are to a large extent implemented at the domestic level. A full understanding of the effects of a given instrument therefore requires analysis also of domestic implementation. A comprehensive review of how the Arctic marine environment is governed would require an in-depth study also of domestic arrangements: legislation, policies, and institutions.[11] This is beyond the scope of this study, which focuses on the global and regional measures that are relevant to the conservation and sustainable use of the Arctic marine environment. A brief overview of bilateral and trilateral instruments is however included in chapter 4, to illustrate the importance of these.

- In many cases a given issue area is addressed by a number of international instruments. Often, a number of instruments will have to be considered together in order to arrive at an understanding of how a given issue area is addressed by international mechanisms.

- Finally, it is often difficult to attribute positive or negative developments in a given issue area to the actions initiated by a particular instrument. The reasons for change may include other societal developments as well as changing natural conditions.

1.5 Organization of work

The Arctic Ocean Review has been organized as a project under the Protection of the Arctic Marine Environment (PAME) working group of the Arctic Council, reporting to the Senior Arctic Officials of the Arctic Council through PAME.

The project has been led by Canada, USA, Russia, Norway and Iceland. The assembling of material and writing of the report has been funded by Norway and carried out by the Institute of Marine Research, the Norwegian Polar Institute and the University of Tromsø. The Outreach and Communications Plan has been prepared by Canada.

The work has been subject to review and comments at the bi-annual meetings of PAME and two expert workshops; in Copenhagen in March 2010 and in Washington DC in September 2009. SAOs have provided comments in their meetings.

1.6 Outline

[11] In addition, some instruments provide for reservations, which affects their implementation.

In chapter 2, we give an overview of the status of the Arctic marine environment, on the basis of work carried out in Arctic Council working groups.

Chapter 3 provides an overview of global instruments relevant to the Arctic marine environment.

Chapter 4 give an overview of regional instruments, including science arrangements, that apply to all or parts of the Arctic.

Chapter 5 is an analysis of the material reviewed in the previous chapters, containing a summary, findings and conclusions.

12.08.2010

Chapter 2. The Arctic Marine Ecosystem

2.1 Introduction

The objective of this chapter is to identify current and future pressures on the marine Arctic and to which degree they create environmental problems that need to be addressed.

The main source for the information is assessments undertaken by Arctic Council.[12] The majority of the AC environmental assessments follow activities or pressures on the environment:

- Arctic Pollution (1997/98, 2002, 2006, 2009);
- Arctic Climate Impact Assessment (2004) with a follow-up on Snow, water, ice and permafrost (2009/2011);
- The Arctic Oil and Gas Assessment (2008); and

[12] See overview also of other assessments and knowledge-generating activities in "Arctic Ocean" in Annex IV of "Assessment of assessments" http://www.unga-regular-process.org/index.php?option=com_content&task=view&id=18&Itemid=20 .

- The Arctic Marine Shipping Assessment (2009).

The upcoming Arctic Biodiversity Assessment (2012 – 2013) under the Arctic Council will have a different approach, having biodiversity as a starting point and analysing the different pressures affecting the status of Arctic species and ecosystems. This difference in assessment approach is parallel to the difference between instruments that focus on specific human activities or the environment (see ch 3).

So far, no integrated marine assessment has been carried out where all ecosystem components and all pressures on the whole marine Arctic have been analysed together. The closest is a report by PAME in 1996, which was the basis for the Arctic Marine Strategic Plan. This limits the possibility to draw clear conclusions for example on the relative importance of different pressures on the environment. There are also few projections on future developments available, limiting the possibility to assess future challenges.

With these limitations in data, the description is broad and generic for the whole Arctic marine area. The focus is on areas influenced by sea ice, with some supplementary comments on the more southerly Atlantic and Pacific areas.

2.2 The Arctic Marine Ecosystems

2.2.1 The Arctic Ocean ecosystem and processes

The central Arctic Ocean mostly consists of basins with depths between 4000 – 5400 meters, divided by several ridges. Steep continental slopes rise from the basins to wide and shallow continental shelves, particularly north of Russia. Large islands and island groups fringe the central basin towards Northeast Canada – Greenland, Svalbard and the Russian Arctic.

The Arctic Ocean is characterized by a high freshwater inflow from rivers, low temperatures and ice-covered waters. There is, however, a large variability in climatic conditions, both geographically and within and between years. Relatively warm and salty waters flow in mainly with the North Atlantic Current, but also from the Pacific through the Bering Strait. Front systems created when cold and warm waters meet and along the ice edge give rise to high productivity, especially in the shallow Barents, Bering and Chucki Seas. The position and timing of front systems and the marginal ice zone can vary substantially. This has consequences for the whole ecosystem and influences, for example, the strength of year classes of fish stocks. Areas in the ice-covered regions which remain ice-free more or less year-round (polynyas) also are very dynamic and highly productive. In the central Arctic Ocean basin, primary production occurs in the ice community and is more limited, whereas productivity from microalgae can be relatively high in some coastal areas.

Between 60 and 80% of all annual primary production is produced in a short and intense bloom of phytoplankton and ice algae between March and May.

The energy is effectively transferred to higher trophic levels, typically by a few species of zooplankton in each area, and sustains large populations of fish, sea birds and mammals. Arctic species have special adaptations to the low temperatures and highly variable conditions; even a seemingly hostile habitat like the sea ice may contain hundreds of species and is considered a distinct ecosystem. Nutrients from the ice-associated species sink to the bottom and feed rich benthic communities in many Arctic waters. Arctic pelagic ecosystems generally have low numbers of species but high numbers of individuals. Because of the strong seasonality, a number of species, particularly seabirds, whales and seals, utilize the area mostly in summer, migrating to southern areas in the fall. The Arctic holds a vast array of biodiversity with many globally significant populations, including more than half of the world's shorebird species.

2.2.2 Status and trends of the marine ecosystem

NOTE: This section needs extensive revision and contributions from CAFF-nominated specialists!

In 2001, CAFF could conclude that much of the Arctic was in its natural states, and that the impacts of human activity in general were relatively minor, though clearly distinguishable on parts of the system.[13] This gave a positive starting point compared to most other parts of the globe: the challenge was to maintain a mostly intact natural environment, not repair damages that already have occurred. Almost 10 years later, CAFF warns about a new cycle of intensive pressures and change.[14] Due to lack of systematic monitoring, the impacts on species and ecosystems are however hard to document. Based on available knowledge, we can broadly characterize status, trends and the most important impacts upon them by humans as:

- Iceflora and fauna:
  The total list of ice algae identified in the Arctic basin in the 1970s comprised more than 200 species. Last decade, it was in an order of magnitude less. A continued reduction of multi-year ice will produce a regime with more similar features to the Southern Ocean, where seasonal ice dominate. This may lead to a complete reorganization of lower trophic levels with corresponding changes in species higher in the food chain like fish, birds and mammals. [15]

- Benthic communities including benthic fish:
  Cold-water coral reefs, coral gardens and sponge grounds are important habitats for a variety of species. Studies from the Aleutians and the Norwegian sea indicate extensive damage from bottom trawling, but little quantitative information is available about their status and trends.[16]

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[13] CAFF 2001: Arctic Flora and Fauna. Status and Conservation.
[14] CAFF 2010: Arctic Biodiversity Trends 2010
[15] Vongraven et al 2010:23, CAFF 2010 indicator 10.
[16] CAFF 2010, indicator 17, Arneberg et al 2010 (Joint Norwegian-Russian environmental status 2008. Report on Barents Sea ecosystem)

In the Bering Sea, two changes in climate shifts have occurred during in the late 1970s and again around year 2000, representing a transition from primarily cold Arctic ecosystems dominated by sea ice, to sub-Arctic conditions. This tends to favour pelagic species like pollock over benthic and bottom-feeding species. Greenland turbot which favours cold, near bottom waters dropped in biomass by over 80 % over a period of 25 years. The reduction in snow crab in the last 5 years is in part thought to be due to a combination of warmer temperatures and decreased bottom productivity.[17]

- Pelagic species including fish:
  In the Barents Sea, some effects of fishing on the ecosystem are detectable. The major commercial fish stocks are harvested sustainably, but some of the smaller stocks are at low levels because of previous or present overfishing.[18]

  There is ample evidence of northward changes in distribution of fish in the NE-Atlantic.[19] In the Bering Sea, the climate induced shifts in the ecosystem in the 1970s lead to pollock biomass increasing 400% and has remained high.[20] With the recent shift to colder conditions, the stock however is in decline again.[21]

- Marine mammals:
  Many populations of *seals* are large and growing. Some ice dependent seals however seem to be in a critical phase, probably due to melting of their habitat and ecosystem changes affecting their prey (e.g. ringed seal, bearded seal, hooded seal).[22]

  The majority of the populations of *polar bears* that are possible to asses are declining with harvesting and climate change effects (habitat changes, loss of prey) as the probably most important reasons. Contaminant induced effects that may have impacts at the population level have also been demonstrated. [23]

  Historically there has been a strong overharvesting of many of the larger *whales* and *walrus*. In areas around Svalbard, bowhead whale and north caper got regionally extinct in the 17th century, but are now reappearing apparently with growing stocks.With the retreat of sea ice, the ecosystem in Hudson bay has been reported to shift from a polar bear/seal system with inuit hunters at the apex, to one

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[17] NOAA "Bering Climate", see http://www.beringclimate.noaa.gov/bering_status_overview.html
[18] Arneberg et al 2010
[19] CAFF 2010, indicator 16
[20] NOAA, ref footnote 6
[21] CAFF 2010, indicator 16
[22] Arneberg et al 2010
[23] Polar Bear Specialist Group 2010, see http://pbsg.npolar.no/en/index.html

dominated by cetaceans with killer whales at the apex.[24]

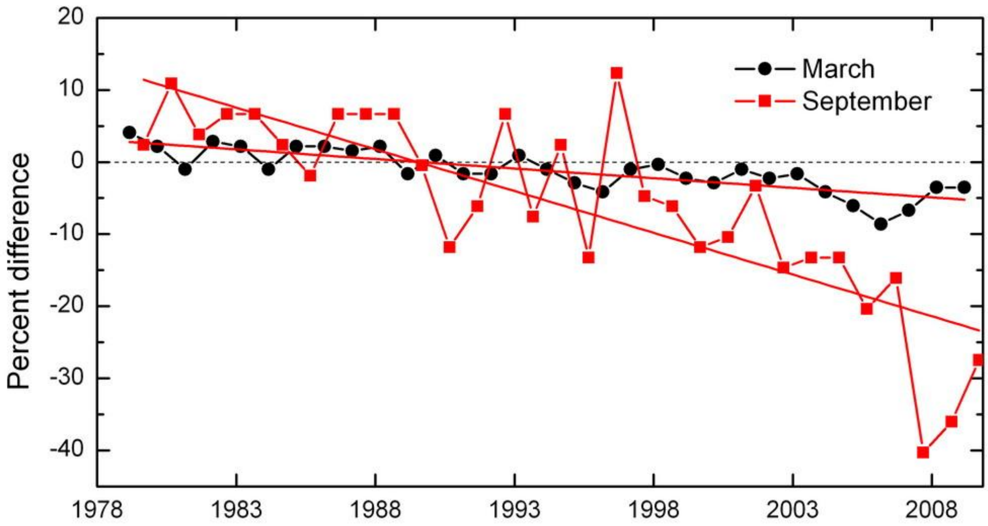
- Sea birds:
  Though many sea bird populations seem to be in a good condition, some are in decline. By-catch and indirect effects from fisheries have contributed to reduce the numbers of for instance common guillemot. Climate change effects can also be detected, both by influencing the availability of prey (e.g. capelin) and by causing a mismatch in the timing of for example hatching of eggs and prey availability (e.g. puffin). Detrimental effects of contaminants are found in a few bird species at the top of the food chain (e.g. glaucus gull, ivory gull), possibly with population effects. Harvesting of seabirds has played a key role for the reduced abundance of bird species in certain areas.[25]

In the rest of the chapter, current and future activities will be described with some summaries of their most important environmental impacts.

2.3 Changes in the climate system and ozone layer

2.3.1 Climate change

Changes in the sea ice is one of the most visible and important changes to the Arctic marine environment. The sea-ice extent in the Arctic Ocean has been reduced by 11,2% per decade in summer and 2,8% in winter since satellite observations started in 1979 (fig 2). The lowest extent ever recorded was in summer 2007 and was about half the size of the average for the 1950's, whenobservations were done from ships and aircrafts. The year after, both the Northeast and Northwest passages were open for the first time ever seen, though the ice covered a larger area than the year before.



[24] Key Findings from International Polar Year 2007-2008 at Fisheries and Oceans Canada: Executive Summary. See http://www.dfo-mpo.gc.ca/science/publications/ipy-api/index-eng.html

[25] CAFF 2010 indicator 19

Fig 1. Changes in the annual maximum and minimum extent of the Arctic Ocean sea ice (relatively to the average 1979-2000) and trends. Source: NOAA 2009.

In parallel, thick multi-year ice has been substituted with thinner and more vulnerable first-year ice (fig 2). Thickness as such is hard to measure for large areas. Measurements of age however indicate a regime shift in the composition of the sea ice and a general thinning. First-year ice made up more than 70% of the total ice cover winter 2008/09, compared to 40-50% in the 1950s. [26]

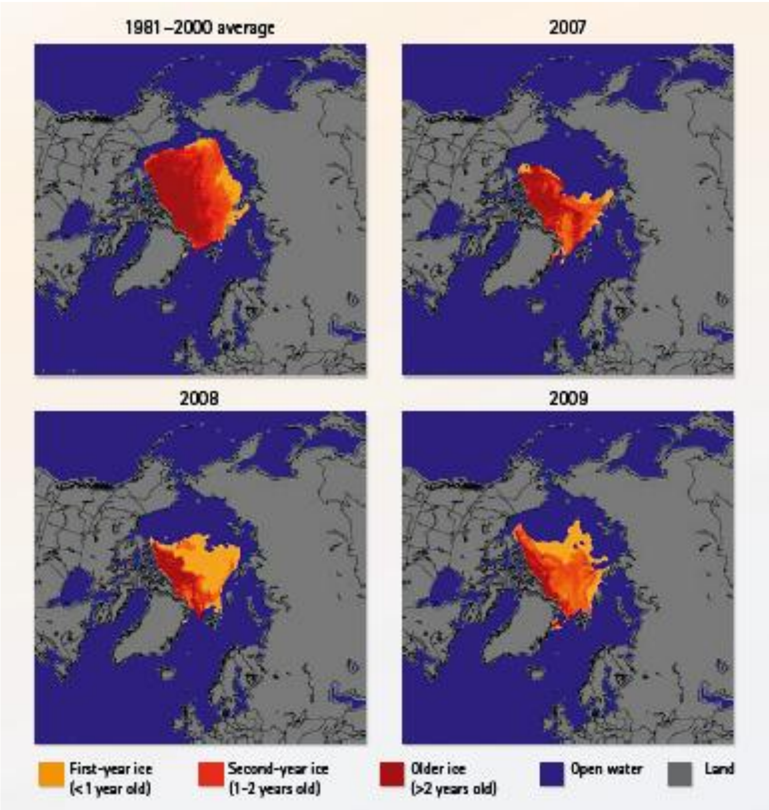


Fig 2: Types of sea ice is a proxy for ice thickness, which is harder to measure. The images compare ice types three summers with the 1981-2000 average. Source: "Melting snow and ice" /NSIDC

The surface water temperature also has increased. This is due to both increased heat uptake when the ice disappears and increased transport of relatively hot water into the region. The surface water also has freshened because of melting of relatively fresh ice and increased precipitation.
The development since IPCC's 2007-report has been faster than forecast. Whereas mainly ice-free summer conditions until recently were predicted to occur by the end of this century, it is now expected before mid-century.[27]

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[26] See EEA sea ice indicator with literature references http://www.eea.europa.eu/publications/eea_report_2008_4/pp37-75CC2008_ch5-1to4_Athmosphere_and-_cryosphere.pdf and "Melting snow and ice" http://brage.bibsys.no/npolar/handle/URN:NBN:no-bibsys_brage_10762?locale=en

[27] "Melting snow and ice", Nov 2009

Rapid melting events also mean that even earlier occurrence of this situation, at least as episodes, cannot be excluded as a possibility.

While the major driver behind these climate changes are global emissions of CO_2, attention has lately been drawn to the possible large effects also of black carbon (soot), ozone and methane. Soot and ozone have seasonal effects that are particularly important for the melting of snow and ice in the Arctic. Since they are relatively short-lived in the atmosphere, reductions in emissions will rapidly reduce atmospheric levels and thus has the potential to "buy time" for the more challenging task of reducing CO2-levels.[28]

Environmental effects: The physical changes in the Arctic Ocean have global effects by increasing the earth's uptake of heat and may also in the future alter the large scale ocean circulation.[29] In the Arctic marine area, a number of changes to the marine ecosystems are expected, like[30]

- Reductions in ice dependent flora and fauna, including possible extinctions. Examples of higher species at risk are polar cod, ringed seals, ivory gulls and polar bears
- A shift from benthic to pelagic production as the sea ice retreats and no longer "feed" the underlying bottom with organic matter from its production. This may threaten species like walrus feeding from shell and clam at the bottom.
- A general increase in the productivity of the oceans as the ice retreats and the water gets warmer.
- Populations of many sub-arctic and temperate species will expand northwards on the expense of Arctic species
- Possible mis-matches in the timing of events that are critical in certain life-stages for some species. An example is the availability of prey for seabirds in the critical periods after hatching of eggs.

2.3.2 Ozone layer

The ozone layer in the stratosphere protects the earth from UV radiation with harmful effects on plants (i.a. phytoplankton), animals and humans (skin cancer, injuries on eyes, infections). Certain chemicals are transported up in the atmosphere and break down the stratospheric ozone. The largest ozone thinning is in the polar regions, particularly the Antarctic, where an "ozone hole" occurs annually in spring after polar sunrise. Due to reductions in the emissions of ozone depleting substances, it is expected that the ozone layer has reached its minimum and will recover to normal thickness around 2050-70 if all countries comply with their commitments and the ozone layer reacts as expected. Climate change however may slow down this process in the polar regions so harmful UV-radiation may occur for an extended period of time. The problem therefore still needs attention in the

[28] AMAP 2009 "Update on Selected Climate Issues of Concern"
[29] UNEP 2007, Global outlook for snow and ice.
[30] CAFF 2010,

Arctic, including monitoring, alert systems to protect the population and assessment of the effects of adopted measures.[31]

2.4 Ocean acidification

Increased levels of CO_2 in the atmosphere not only lead to global warming, but also have a chemical impact on the oceans. Almost 30% of the global CO_2 emitted in industrial times have been dissolved in the ocean, where it reacts with water forming carbon acid. This process is well understood, and it is expected that ocean acidification may increase by 150% by 2050. However, less is known about the effects on marine organisms. Organisms forming shells and skeletons by calcium (corals, shells, some species of phytoplankton and fish) can potentially be severely affected. Changes in acidity also affect species' tolerance for other stressors like changes in ocean temperature. Changes in species composition can be expected according to tolerance for a more acid environment. Due to the speed of change, warnings of potential mass extinctions have come, based on prehistoric events. Effects are expected to be largest in cold waters. [32]

2.5 Arctic pollution[33]

The main sources of pollution in the Arctic marine environment are located outside the Arctic, though there also are some Arctic sources. Hazardous substances are transported to the Arctic by many mechanisms (fig 3). Source regions, pathways and impacts vary for the different substances. In addition, marine activities in the Arctic may have emissions to air, with indirect effects also on the ocean. In normal marine activities accidents may occur that pollute the environment. The impacts may vary due to the nature of the event and the effects are long lasting if not permanent.

[31] ACIA key finding # 9, NILU http://www.nilu.no/index.cfm?ac=topics&folder_id=4341&text_id=26398&view=text

[32] See a "summary for policy makers"-report at http://www.ocean-acidification.net/ and a CBD report at http://www.cbd.int/doc/publications/cbd-ts-46-en.pdf

[33] Based on AMAP 2009: "Arctic Pollution 2009" supplemented by previous AMAP summary reports if nothing else is cited

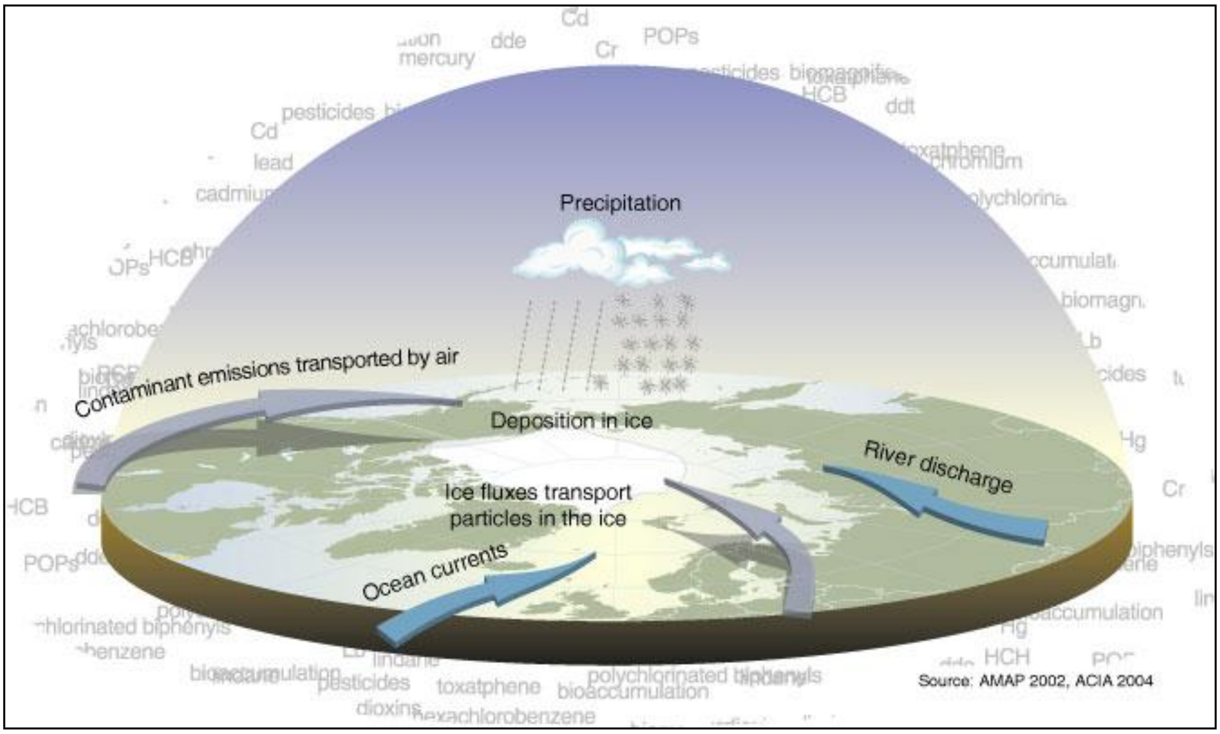

Fig 3: pathways for hazardous substances into the Arctic

2.5.1 Persistent organic pollutants (POPs)

POPs is the group of substances giving highest concerns because of their current levels and effects. Many of the substances are chemically bound to fat, which is vital for the survival of animals in a cold climate. This is one of the reasons why they biomagnify so the highest concentrations are found in species at the top of the marine food chain (fig 4). Many Arctic species undergo periods of starvation, surviving from the energy stored in fatty deposits. Stored toxics are then remobilized in the body and may hit sensitive organs. Also humans with a traditional diet dominated by marine, blubber-rich food items are exposed.

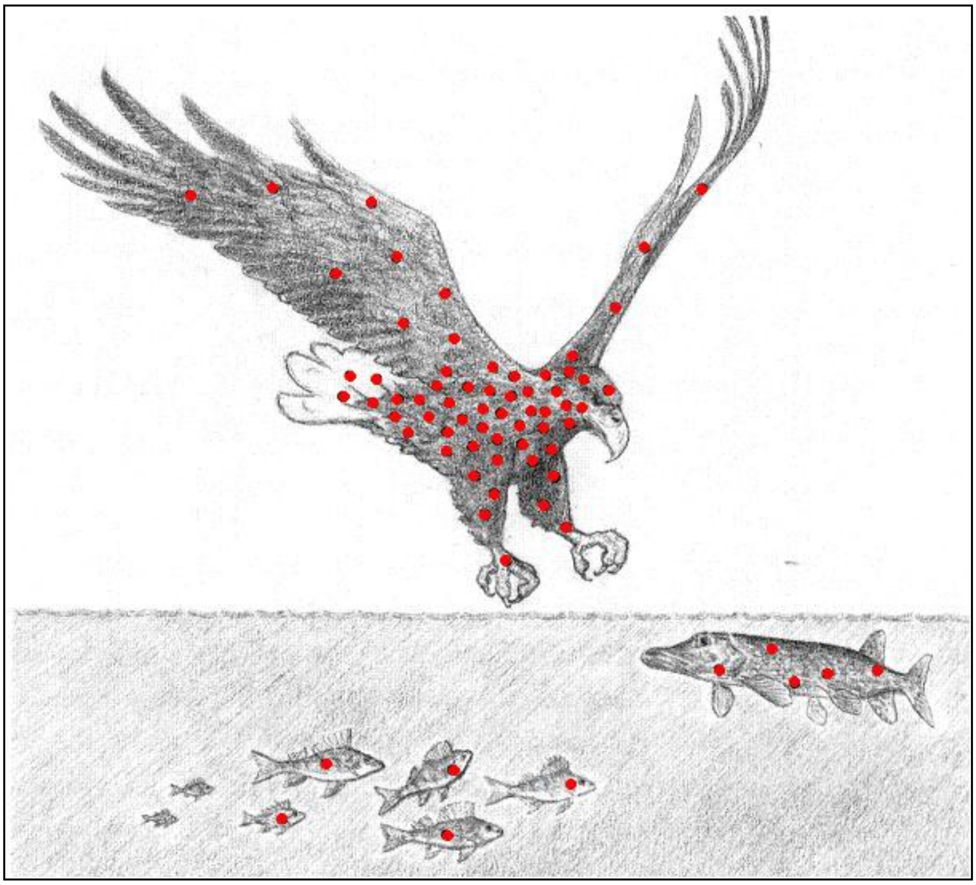

Fig 4: *Biomagnification. (Swedish Environmental Protection Agency, 1998. Drawing:Johan Wihlke)* ***Note****: this should be redrawn with a marine food chain starting with plankton.*

The levels of several *legacy compounds* seem to decline in the Arctic, both in humans and in the environment (most evident for PCB, DDT, HCH, HCB and chlordane). Even though production and use of regulated chemicals are reduced, many of them are already dispersed in nature and in products in use so levels do not fall correspondingly. Levels in some species on top of the marine food web nevertheless are still high enough to affect the health of wildlife and humans. One example is the contaminant associated thinning of egg shells of ivory gull in Svalbard and the Russian Arctic.[34] Studies on humans indicate that for some groups in the Arctic, there is a correlation between exposure of POPs and i.a. diabetes, sensitivity to infections and health deficits among newborns, including stillbirths that may be higher for boys than girls. Several life style factors also contribute to human diseases with mixture of traditional versus store-bought food as one important factor for dietary exposure of contaminants.

Knowledge about *“new” POPs not yet regulated* is not as good. A report assessing the potential for chemicals to reach the Arctic and accumulate in

[34] Miljeteig et al 2009 (Miljeteig, C., Strom, H., Gavrilo, M.V., Volkov, A., Jenssen, B.M., Gabrielsen, G.W., 2009. High Levels of Contaminants in Ivory Gull Pagophila eburnea Eggs from the Russian and Norwegian Arctic. Environmental Science & Technology 43, 5521-5528)

the Arctic food-chain, pointed out 65 substances produced in more than 1000 tons/year and 4300 with low or unknown production volumes. AMAP has recently focused on brominated flame retardants, fluorinated compounds, PCN, endosulfan and several current-use pesticides. Several of these are candidates for international regulations. New chemicals are continuously being introduced on the markets.

2.5.2 Heavy metals
One of the findings in prior AMAP assessments is that *mercury* is deposited from air to surfaces in polar spring. The Arctic thus was assumed to be a global sink-region. Historically the in-fluxes and levels have increased strongly since the mid 1800s (burning of coal is an important source). Trends in recent years are more contradictory both geographically and over time.[35] This is being assessed in a new report due in spring 2010. AMAP already has published that levels of mercury in humans in the Arctic decrease, though they are still above recommended health guidelines in Canada and Greenland.[36]

Levels of *lead* are decreasing, following the phasing out of leaded petrol. Like *cadmium,* it is a minor problem in the marine environment apart from some areas contaminated by local sources.[37]

2.5.3 Radioactivity
AMAP's 2009-assessment confirms that levels in the Arctic environment decrease, like it also was reported in 2002. The dominating sources for current levels are historic discharges from testing of nuclear weapons particularly in the 1950's and the 1986 Tsjernobyl accident. Current discharges from spent fuel reprocessing plants (Sellafield, Le Hague) have declined due to new technology. It is also reported that the handling of potential sources in Russia has improved.

Monitoring of Cesium-137 in fish in the Barents Sea, where many sources aggregate, demonstrate levels of activity that are low compared to marine areas in Europe and well beyond critical levels for exposure through diet.[38]

2.5.4 Acidifying substances and Arctic haze
(Short description needed since increased emissions in the Arctic – i.a. from shipping – will contribute to this problem. Ref. AMAP 2006-report on this issue.)

2.6 Economic activities within the Arctic Ocean

This section looks briefly at status and future prospects for economic activities within the Arctic Ocean and summarizes the most important environmental impacts from each of them.

[35] See AAMAP 2005 (heavy metals report) and MOSJ http://mosj.npolar.no/filearchive/TungmetallerTolkning%282006%29.pdf
[36] AMAP 2009 page 41 - 49
[37] Arctic council 2009: Regional Programme of Action, page 7-8.
[38] NRPA 2004, see http://mosj.npolar.no/pavirkningsfaktorer%20Mappe/Radioaktivitet%20i%20fisk

2.6.1 Shipping [39]

In 2004, ap. 6000 vessels had one or more voyages in what states conceived as the Arctic marine area. Half of these were operating on the Great Circle Route between Asia and North America that crosses the Aleutian Islands. If we exclude this traffic, almost 50% of the vessels were fishing boats and 20% bulk carriers. [40]

Nearly all shipping in the Arctic today is destinational, conducted for re-supply of Arctic communities, marine tourism and moving natural resources like petroleum products and various types of ore out of the Arctic. Nearly all voyages took place in the periphery of the Arctic Ocean with the Barents Sea as the most heavily trafficked area (fig 5). In the central Arctic Ocean, shipping activity is low.

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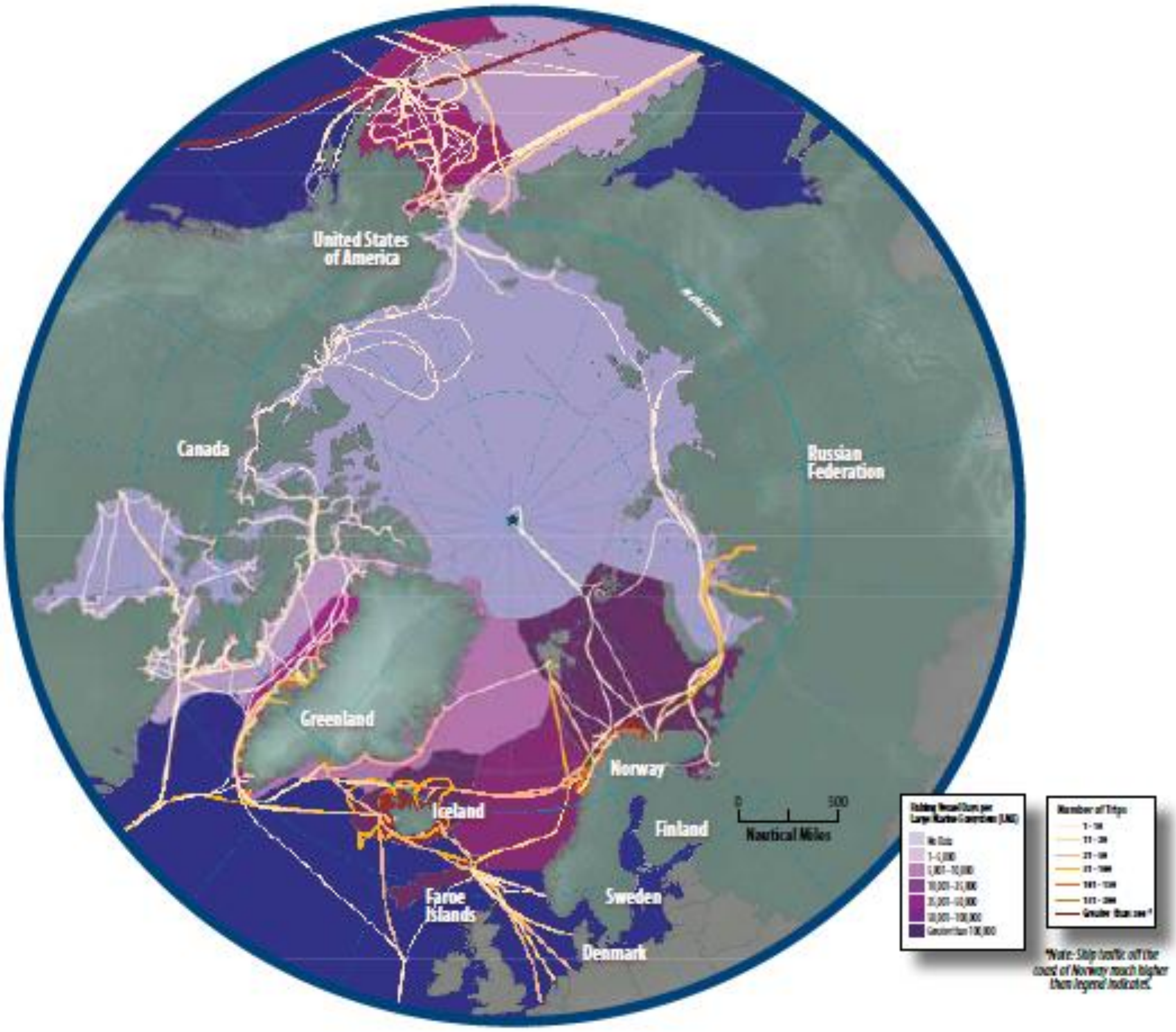

[39] Based on Arctic Council 2009, Arctic Marine Shipping Assessment (AMSA) if nothing else is cited

[40] AMSA, p. 6-7 and 71-72

Fig 5: Overview of all vessel activity for 2004. Activity of fishing vessels is marked with coloured areas, whereas other vessels' traffic is marked with dominant sailing routes. AMSA 2009

For the near future up to at least 2020, dominating pattern of traffic is expected to be destinational to and from Arctic harbours, not trans-Arctic between continents. A major driver for this will be Arctic resource development (fish, hydrocarbons, minerals, timber etc) as well as tourism. It will take time to develop transcontinental shipping on regular commercial terms into considerable volumes. This will be inhibited by several factors like a lack of major ports and critical infrastructures along the routes, low possibilities for search and rescue and problems keeping fixed timetables necessary for the "just-in-time" delivery dominating container transport.[41] In the mean-time, destinational traffic is likely to increase, posing many of the same risks and challenges as trans-continental shipping.

Environmental impacts: Under normal operations, environmental effects of shipping include:

- regular discharges to the sea of oil residues, lost cargo, sewage, garbage and leakages of substances from hull fouling
- air emissions affecting the climate system (CO_2 and particles) and causing acidifying substances and Arctic haze (SO_x, NO_x and exhaust gases)
- a risk of introducing alien species via ballast water, hulls and cargo
- disturbances of marine life (i.a. mammals and birds) from underwater noise and ship operations
- various environmental effects (habitat change, pollution) on coastal and terrestrial areas from construction of harbours and other infrastructure

Accidents may lead to large point-discharges of oil and other types of cargo, and long-term effects of leakages from wrecked ships.

2.6.2 Fisheries

There are no commercial fisheries in the central Arctic Ocean and many of its adjacent seas, but subsistence catches from indigenous peoples and other inhabitants. Within the Arctic marine area there are however large commercial fisheries both in the North-Atlantic (Barents Sea, Norwegian Sea, Greenland, Iceland) and the North Pacific (Bering Sea). The average landing of these fisheries over the last four decades of the 20th century corresponds to approximately 6 million tons a year.[42]

There are many uncertain factors that make it difficult to predict how the fish stocks will respond to a warming climate. Warmer ocean temperatures will

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[41] See discussion of drivers and uncertainties in ch 2 of Brunstad 2007 and in AMSA – particularly the chapter on scenarios.

[42] Hoel and Viljamson 2005: "Fisheries, Arctic" in Mark Nutall (ed) *Encycopedia of the Arctic*, Routledge. The estimate probably includes landings from some fisheries south of what here has been defined as the Arctic marine area.

most likely increase primary production, but it is uncertain whether it also will affect the timing of plankton blooms which determines how effectively this energy is transferred to i.a. fish. However, the productivity of the benthic communities, possibly also benthic fish species, may be reduced due to reduced nourishment from the sea ice. It can already be observed how the geographic distribution of species will move northwards. This may favour species that can increase their range (likely for cod), whereas others will only have their ranges shifted northwards (likely for capelin) with more uncertain effects on abundance of the stocks. New sub-arctic and temperate species are expected to replace existing fish.

Ocean acidification due to higher CO_2-levels in the atmosphere, introduced alien species and conflicts with other activities like petroleum and shipping may also affect fish stocks and fisheries negatively.

In considering future prospects for Arctic fisheries, it must also be taken into account that the total quotas for many years have been at a historical high level.[43] The management regime for fish seems to be more important for the economic sustainability of the industry than climate change effects.[44]

Environmental effects: Fisheries have large scale effects on the ecosystems by:

- directly affecting stocks of target species and species of other fish, birds and marine mammals caught as by-catch – both from active gear and “ghost-fishing” from lost gear.
- indirectly reducing the availability of prey for all dependant species in the ecosystem.
- adversely affecting vulnerable benthic habitats by bottom-trawling
- possibly changing the genetic composition of fish stocks due to selective catch of the larger individuals

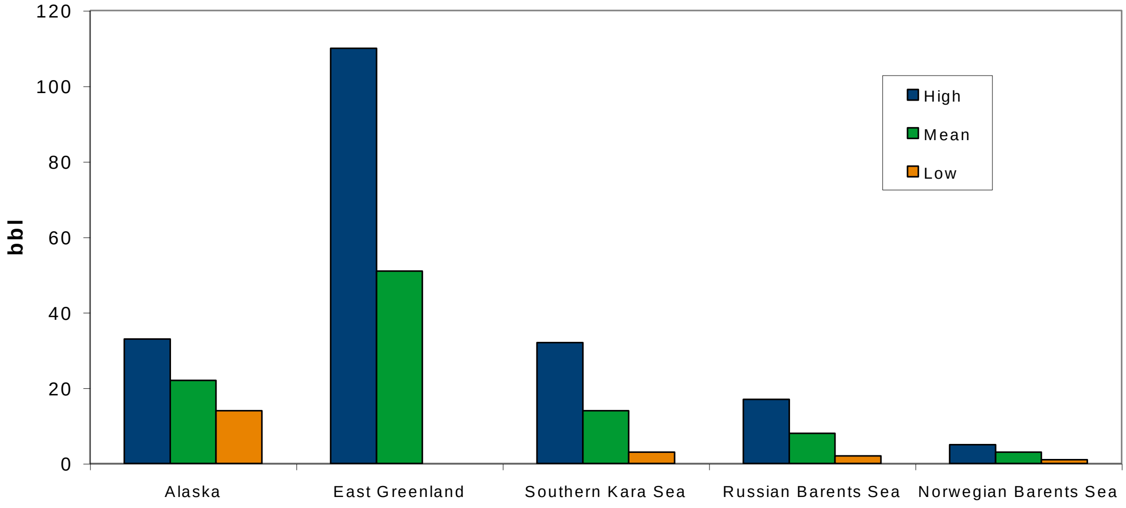
2.6.3 Offshore oil and gas activities

Large scale petroleum exploration on land started in the Arctic in the 1970s. Offshore activities commenced later and have so far been limited to waters off the coasts of Alaska, Norway and NW Russia. Today the Arctic produces ap. 10% of world oil production and 25% of the gas, mostly from Russia (80% and 99% share of Arctic production, respectively).[45]

The Arctic contains 5% of the worlds *known* oil reserves and 20% of the reserves of gas. Most of this has been discovered in Russia. (75% and more than 90% shares, respectively).[46] In addition, there are probably significant *undiscovered* resources. Recent estimates of technically recoverable petroleum resources north of the Arctic circle indicate that most of the

[43] Huntington in prep.
[44] Eide et al
[45] Arctic oil and gas assessment p 14 - 17
[46] Arctic oil and gas assessment p 32. The text does not distinguish between on-shore and off-shore reserves.

reserves are off-shore and that reserves of gas and gas liquids are larger than oil.gas (figure 6).[47]



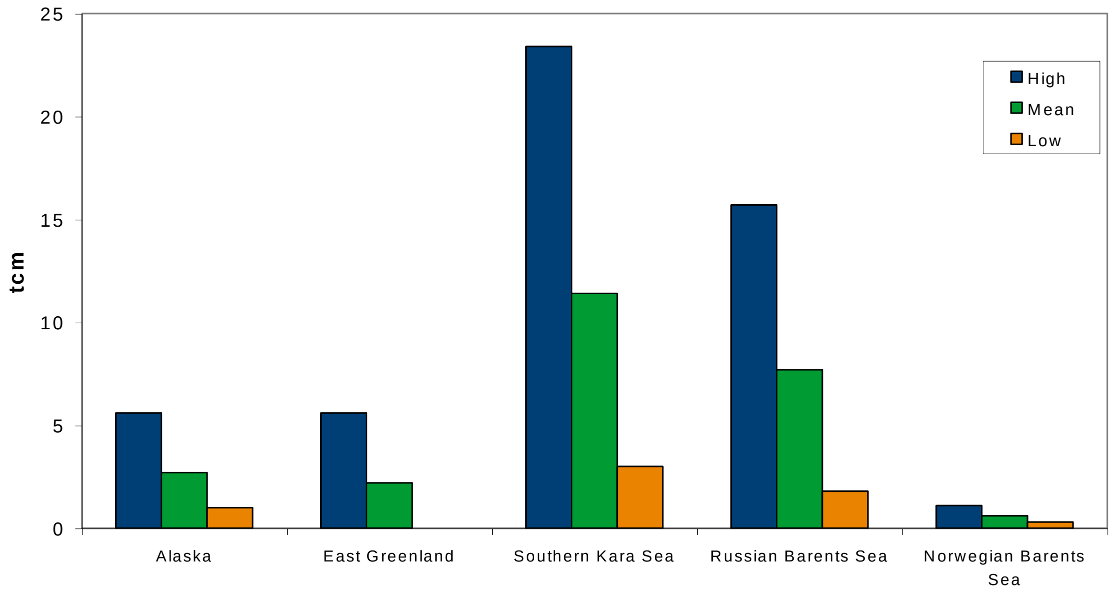


Fig 6: Estimated petroleum reserves in some Arctic marine regions. Upper panel: oil, lower: gas. The colours indicate the uncertainty in the estimates. (Source Brunstad/Econ 2007)
NOTE: This figure is based on data from the previous USGS assessment. It is used provisionally since it demonstrates how uncertainty can be better represented than just quoting the median estimates. Are there similar illustrations in the 2008-version – aggregated for appropriate regions that are representative for the whole Arctic? If not - can someone make it?

Uncertainty about offshore development is large. Stable and relatively high petroleum prices, reduced ice cover and stable political conditions regionally compared to other areas are factors that will stimulate developments in the

[47] US Geological Survey, see Bird et al 2008. Factsheet available at http://pubs.usgs.gov/fs/2008/3049/

Arctic. High costs for offshore developments and transport particularly of gas are obstacles pointing in the opposite direction. The recent blow-out in the Mexican Gulf and stronger environmental regulations may also slow down offshore developments in the Arctic.

Environmental effects: Accidental oil spills from offshore production and shipments can have different impacts in an ocean with low temperatures, particularly if discharged into the ice. The impacts are not necessarily proportional with the size of a discharge, but depend heavily on where and when it takes place and the congregation of affected species. Other effects are operational routine discharges of oil components, drilling fluids, chemicals and produced water, physical disturbances of the sea-bed and emissions to air that contribute to greenhouse effects, faster melting of snow and ice (soot), acidifying substances and Arctic haze. Furthermore, the recovery after any type of spill is not likely to restore the environment to pre-incident state.

2.6.4 Tourism

Arctic tourism has long historical roots and is now a mature industry offering very different products for different client groups. Ship-based tourism is the largest activity. The largest cruise activities take place in the areas around Greenland, Iceland, Svalbard and the Norwegian coast.The number of passengers probably doubled from 2004 to 2007 and is expected to continue to grow[48]. The negative effects of the financial recession 2009-10on at least some Arctic markets however demonstrate the economic sensitivity of such predictions.

Environmental effects: Cruise ships have expanded their areas of operations into areas beyond the capacity of existing rescue capabilities. As noted in the AMSA report, the majority of cruise ships observed in the Arctic are not purpose-built for Arctic operations which may increase the likelihood for a catastrophic incident. In case of accidents, salvage of life will usually be a priority, with lower attention to and resources available for prevention of environmental harm like oil spills.[49] Environmental effects are mostly the same as for shipping. An additional effect is that tourists seek out attractive localities with wildlife (bird colonies, walrus haul-out sites etc) or cultural heritage objects that can be negatively affected from their behaviour.

2.6.5. Land-based activities

Activities on land in the Arctic affecting the Arctic marine area include oil- and gas activities, mines, industrial complexes, harbours and human settlements. The marine pollution effects are with a few exceptions mostly local. In Russia, more than 100 ”hot spots” near the coast and rivers have been registered, most of them in NW Russia. 30 of them have been prioritized for future action plans. Physical destruction and fragmenting of coastal and marine habitats is a highly prioritized problem.[50] With increased

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[48] UNEP 2007
[49] AMSA p 78-79
[50] PAME 2009.

economic activities in the Arctic, land-based activities may have a larger influence on the marine area in the future.

2.6.6. Other marine activities

- *Alien species* can be introduced through a number of pathways in addition to transport, like aquariums, aquaculture, angling, restaurants and sports. There is a significant potential for dispersion of species from the Pacific Ocean to the NE Atlantic. Examples from other marine areas show that alien species, for example shell and jellyfish, may cause significant shifts in ecosystems and have led to large economic losses.
- *Bioprospecting* looks for useful applications, processes or products in nature i.a. from species living in cold waters. The extent and environmental impacts of the activity in the Arctic have not been investigated and assessed.
- *Seabed mining* for minerals in the deep seabed received much attention in the UNCLOS negotiations when expectations were high about a new industry. Exploration and exploitation can also take place on the more shallow continental shelves. However, the development of a new sub-sea industry has been much slower than anticipated and is probably almost non-existent in the Arctic marine area. Dredging, sand and gravel extraction also are very small activites, at least in the OSPAR part of the Arctic.[51]
- *Research*. Marine research is mostly ship-based with the same impacts on the marine environment as any shipping activity. Specific research activities include deployment of scientific equipment, seismic activities, and handling, disturbance and destruction of animals under sampling and experiments. What has been assessed about environmental impacts in the Arctic?
- *Military activites* include operations with warships and submarines, construction of harbours, under-water installations and storages, laying of cables and usage of ammunition. The extent and environmental affects of these activities have not been reported much. On the other hand, there is an extensive literature on the impacts particularly on marine mammals, but also fish, from the use of sonars, underwater explosions and other sources of noise and pressure waves.[52] Military accidents and dumping of military equipment, munitions and waste has also received much attention, particularly the nuclear heritage from the Soviet northern fleet. [53]
- *Marine energy production (wind farms, facilities for usage of tidal waves and currents, floating nuclear facilities etc)* are future activities in the Arctic apart from small installations.

[51] OSPAR 2009b, page 13
[52] Military sources are included in these reports: OSPAR Commission (2009a): "Overview of the impacts of anthropogenic underwater sound in the marine environment". OSPAR Commission (2009b): "Assessment of the environmental impact of underwater noise".
[53] See for example AMAP 2002 "Radioactivity in the Arctic"

2.7 The relative importance of pressures on the marine ecosystems

The state of the marine environment today is the result of the evolution and variability of the natural system, combined with the cumulative impacts of all human activities in the past and present. In attempting to manage the marine environment, we must understand particularly which human activities that have the largest effects. It may also be important to distinguish between pressures that have an origin mainly outside the marine Arctic, and activities within this ocean area, since the policy implications on how to address them can be different. Though a clear ranking of pressures are hard, we can broadly summarize that:

- Activities mostly originating outside the Arctic Ocean:
  Global climate changes already influence the Arctic Ocean on larger scales, affecting species and the structure and function of ecosystems. Hazardous substances are transported over long distances and affect particularly marine species at the top of the food chains, and humans with a traditional marine diet. Impacts are demonstrated for individuals, but some populations may also be affected. Migrating species can be affected when being outside the Arctic – both negatively (pollution, harvesting, habitat destruction) and positively (geese on Svalbard increase due to better protection of winter habitats in Europe).

- Activities in the Arctic Ocean:
  For centuries indigenous peoples around the Arctic Ocean have subsisted on marine mammals, seabirds and fish. Large-scale economic developments in the marine area have been very limited. The more temperate areas in the North East Atlantic Ocean do however sustain some of the world's richest fisheries, and also have several shipping routes and some offshore oil- and gas activity. Here, several integrated assessments have concluded that fisheries are the human activity having the largest impacts on the marine ecosystem under present activity levels.[54] (Bering Sea?)

Looking into the future, global warming is expected to be the single most important driver for changes to the Arctic marine environment.[55] The direct effect is an expected change of the ecological regime, particularly in areas covered by sea ice. But the melt will also pave the way for future develop-ments within the Arctic Ocean itself, like shipping, fishing, tourism and oil and gas activities, each with additional impacts and potential for emergencies. The pace and extent of these activities will be influenced by many socio-economic drivers, determining whether they will be profitable or not. It is hard to make predictions across industries for their future developments and therefore anticipate which of them will affect the marine ecosystem the most in the future. But generally, it is likely that the

[54] This is the conclusion in the cumulative impact assessments undertaken by Norway for both the Barents Sea and the Norwegian Sea (Norwegian Ministry of the Environment, 2006 and 2009) and in a joint Russian-Norwegian study for the Barents Sea (Arneberg et al 2010). Check: OSPAR's QSR 2010?

[55] CAFF 2010, page 9

importance of pressures inside the marine Arctic will increase when new activities build up in marine areas that have had little or no human presence so far. A conservative prediction also is that fisheries will continue to be the most important local pressure on the ecosystems in the near future before other activities increase.

2.8 Conclusions

Chapter 3: Global treaties and arrangements pertaining to the Arctic marine environment

Intent of chapter: Provide an overview of global treaties and arrangements of relevance to the Arctic marine environment.

3.1 Introduction – the international context
3.2 The law of the sea (incl. current processes under UNGA auspices)
    3.2.1 Evolution
    3.2.2 The Law of the Sea Convention
    3.2.3 Associated agreements and processes
3.3 Environment
    3.3.1 General
    3.3.2 Biological diversity
    3.3.3 Chemicals
    3.3.4 Climate and atmosphere
3.4 Fisheries
    3.4.1 The Law of the Sea
    3.4.2 UN 1995 Fish Stocks Agreement
    3.4.3 FAO 1993 Compliance Agreement
    3.4.4 FAO 2009 Port State Agreement
    3.4.5 FAO 1995 Code of Conduct for Responsible Fisheries & IPOAs
    3.4.6 1946 International Convention for the Regulation of Whaling
    3.4.7 UNGA resolutions
3.5 Shipping
    3.5.1 United Nations Convention on the Law of the Sea
    3.5.2 The IMO conventions
    3.5.3 Non legally binding IMO instruments
3.6 Marine science
3.7 Oil and gas activities
3.8 Conclusions

3.1 Introduction

This chapter reviews global treaties and arrangements relevant to the conservation and use of the Arctic marine environment.

The starting point is a brief overview of the law of the sea and the 1982 Law of the Sea Convention in particular, with a view to how this provides for jurisdiction over ocean space. The Law of the Sea provides the context within which all other oceans-related treaties and arrangements have to be understood and implemented. It also contains provisions for specific issue areas, such as fisheries, science, and environment.

Then relevant global treaties for specific issues are described, along with relevant provisions of the Law of the Sea and non-binding arrangements.

3.2 The law of the sea

3.2.1 Evolution

The law of the sea have evolved over centuries and is constituted by international treaties, customary international law general principles of law and jurisprudence. As the uses of the oceans and their resources have grown, ever more detailed international rules have been developed. Until the end of the Second World War, the generally accepted view was that the ocean was mainly subject to the freedom of the seas apart from a belt of sea along the coasts over which sovereignty of the coastal states extended. In 1958, the first United Nations Conference on the Law of the Sea (UNCLOS) was convened in Geneva, resulting in four conventions - Convention on the Territorial Sea and the Contiguous Zone; the Convention on the High Seas; the Convention on Fishing and Conservation of the Living Resources of the High Seas; and the Convention on the Continental Shelf, formalizing the core of international maritime law .UNCLOS II in 1960 failed in reaching agreement on the breadth of the territorial sea and fishery limits.

UNCLOS III was a major negotiation process between 1974 and1982, resulting in the 1982 United Nations Convention on the Law of the Sea (The Convention). This Conference sought to codify and further develop the law of the sea across a wide range of traditional and emerging oceans issues. It resulted in a comprehensive convention that set forth a global order of the oceans, including the introduction of the exclusive economic zone (EEZ) and the extended continental shelf that extended coastal state rights further seaward.

The Law of the Sea Convention has an important position in international law as other agreements must be compatible with it. It is widely considered to have a kind to have a kind of constitutional status, establishing general principles and carefully mandating states, international organizations and diplomatic conferences to develop further rules, measures, and regulations. Building on the Convention, a number of other international agreements have been developed at various levels. The body of law regulating the relations between states is referred to as the international law of the sea.

3.2.2 *United Nations Convention on the Law of the Sea* (LOSC)[56]
LOSC was adopted in 1982 and entered into force in 1994. LOSC has 160 parties, among them the Arctic States Canada**,** Denmark, Finland, Iceland, Norway, Russian Federation and Sweden. The United States is not party.

Objective
The objective of the Convention is to establish a legal order for the seas and oceans which will facilitate international communication, and will promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment. The objective is further to be a mechanism to address oceans issues in an holistic manner, as the problems of ocean space are closely interrelated and need to be considered as a whole.

Geographical scope
The area of application of the Convention is global: LOSC contains different regimes for the management of resources and activities in the different maritime zones defined by it (see below) – in total covering all ocean space.

Functional scope
In the *territorial sea*, out to maximum 12 nautical miles (nm), LOSC confirms the coastal State´s sovereignty over the water, sea bed and air space. Other States have limited rights, most notably the right of innocent passage by ships.

LOSC also established *exclusive economic zone (EEZ),* extending a maximum of 200 nm. Here a coastal State has sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living. The coastal State is obliged to ensure that the living resources in the exclusive economic zone are not endangered by over-exploitation. Allowable catch limits are to be set and the concept of maximum sustainable yield is introduced. Other States enjoy several rights and are subject to duties in the EEZ, most notably the freedom of navigation.

Pursuant to LOSC the **continental shelf** of a coastal State comprises the sea-bed and subsoil of the submarine areas that are a natural prolongation of its land territory. A coastal state is entitled to continental shelf out to 200 nm (or to a maritime boundary with another state), but may go beyond 200 nm if the shelf meets certain criteria. The Convention provides that the coastal State is to delineate the outer limits of its continental shelf, where that shelf extends beyond 200 nm and submit information on the limits to the Commission on the Limits of the Continental Shelf (CLCS). CLCS shall make recommendations to coastal States on the outer limits of their continental shelves. The limits of the shelf established by a coastal State on

[56] http://treaties.un.org/Pages/ViewDetailsIII.aspx?&src=TREATY&mtdsg_no=XXI~6&chapter=21&Temp=mtdsg3&lang=en (6. desember 2009)

the basis of these recommendations shall be final and binding. The coastal state exercises sovereign rights over the continental shelf for the purpose of exploring it and exploiting its natural resources.

Further LOSC provides that the deep seabed area beyond the coastal States' (extended) continental shelves is the common heritage of mankind. The Convention establishes the International Sea-Bed Authority (ISA) to oversee the management of activities in the Area.

LOSC codifies the principle of freedom of the *high seas,* which comprises a range of freedoms, including fishing and navigation.

With regard to the *marine environment*, LOSC contains several provisions concerning protection and preservation, including: a general obligation for all States to protect and preserve the marine environment, several definite measures to prevent, reduce and control pollution of the marine environment, an obligation for States to cooperate in formulating and elaborating rules and standards, and provisions regarding enforcement both by flag States, coastal States and port States.

Relevant for *ice-covered areas* is the coastal State´s right to adopt end enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence.[57]

3.2.3 Associated agreements and processes

The Law of the Sea Convention has been supplemented by two international treaties relating to deep seabed minerals and fisheries, respectively. Also, the General Assembly has developed the practice of adopting annual resolutions on oceans and the law of the sea and fisheries, respectively. The General Assembly has also initiated processes related biodiversity and ?…

The Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 was adopted in 1994 and entered into force 1996. It addresses difficulties with the seabed mining regime of LOSC that prevented many industrialised countries from acceding to the Convention. It consists of 10 articles dealing mainly with procedural aspects and an extensive annex modifying the effect of the deep seabed mining provisions (Part XI) of the LOSC.[58]

The United Nations Agreement for the Implementation of the Provisions of

[57] LOSC article 234.
[58] http://www.un.org/Depts/los/convention_agreements/convention_overview_part_xi.htm

the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA) was adopted in 1994 and entered into force in 2001.[59] It sets out principles for the conservation and management of such fish stocks, most notably the precautionary approach, which is made operational through the introduction of reference points for assessing fish stocks, and the ecosystem approach. Since such stocks migrate across maritime zones, the Agreement requires that their management in coastal states' zones and in the adjacent high seas are compatible. The Agreement also establishes minimum international standards for the conservation and management of straddling and highly migratory fish stocks and establishes mechanisms for compliance and enforcement of measures adopted by the RFMOs also by states that are not members.

Following the entry into force of the Law of the Sea Convention, the need to review developments and provide a basis for debate in the General Assembly was strengthened. Therefore, in 1999, the General Assembly decided to establish the *United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea* (the Consultative Process)(resolution 54/33).[60] The consultation process has had its mandate renewed several times. It is intended to facilitate the annual review by the General Assembly of developments in ocean affairs and the law of the sea by considering the Secretary-General's report on oceans and the law of the sea and by suggesting issues to be considered by the General Assembly. The emphasis has been on identifying areas where coordination and cooperation at the intergovernmental and inter-agency levels needs to be enhanced. The consultation process has reviewed the status of for example marine science, vulnerable marine environments and ecosystem-based oceans management.

The UN General Assembly has also initiated processes for specific issues. An Ad Hoc Open-ended Informal Working Group to study the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction was established in 2007. The working group has had its mandate renewed several times and continue to work. Following the recommendations of the 2002 World Summit of Sustainable Development, the General Assembly in 2005 initiated the start-up phase of a Regular process for global reporting and assessment of the state of the marine environment.[61] A framework was endorsed by the General Assembly in 2009, but institutional mechanisms have to be developed further before the full assessment process eventually can get started.

3.3 Environment

3.3.1 General

[59] http://www.un.org/Depts/los/convention_agreements/convention_overview_fish_stocks.htm
[60] http://www.un.org/Depts/los/consultative_process/consultative_process_background.htm
[61] http://www.un.org/Depts/los/global_reporting/global_reporting.htm

The 1982 Law of the Sea Convention[62] provides an international framework for protection and preservation of the marine environment. Part XII of LOSC contains general obligations to protect and conserve the marine environment, obligations on cooperation and obligations to prevent, reduce and control pollution of the marine environment from different sources. The general obligation in Article 192 establishes that states have the obligation to protect and preserve the marine environment. Furthermore it follows from Article 193 that the have the sovereign right to exploit their natural resources in accordance with their duty to protect and preserve the marine environment. Article 194 requires states to take measures to prevent, reduce and control pollution of the marine environment. Hereby states are also required to take measures necessary to protect and preserve rare or fragile ecosystems and habitats of threatened or endangered species.

In addition to the general, global framework provided by the Convention, a number of non-legal arrangements are important for the conservation and use of the marine environment globally.

The 1995 Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) seeks to prevent the degradation of the marine environment from land-based activities. It is designed to assist States in taking actions individually or jointly according to their respective policies, priorities, and resources. It constitutes a practical source of guidance for action that must take place at the national and regional level; identifies steps for making available knowledge and experience about effective measures to combat land-based sources of marine pollution; and offers instruction on how to involve the relevant United Nations institutions in the implementation effort.

The 1992 United Nations Conference on the Environment and Development (UNCED) produced a global action plan for the environment, *Agenda 21*. Chapter 17 sets forth an ambitious program for the international community in pursuing the objective of sustainable development of the oceans and coasts. To this end, it promotes new approaches to managing human uses of ocean resources, including environmental impact assessment and natural resource accounting techniques; economic incentives to encourage industrial and agricultural practices that avoid degradation of the marine environment; and protection of the ecosystems and habitats of marine species. A number of program areas are listed, including integrated management of coastal areas, development and implementation of strategies to prevent degradation of the marine environment from land-based activities, strengthening implementation of international measures to prevent marine pollution from vessels and from dumping at sea, improved management of coastal fisheries, and implementation of obligations for international cooperation to conserve marine living resources found on the high seas.[63]

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[62] United Nations Convention on the Law of the Sea
[63] http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf

The 2002 World Summit of Sustainable Development produced the *Johannesburg Plan of Implementation*, which also deals with oceans issues and call for a number of institutional improvements. Specifically, to ensure sustainable development of the oceans, the plan of implementation among other things also calls for the application of the ecosystem approach (to oceans management) by 2010, the promotion of integrated oceans management at national level, and the establishment of marine protected areas by 2010.[64]

3.3.2 Biological diversity

Convention on Biological Diversity

The Convention on Biological Diversity (CBD) is a global treaty.[65] The Convention was signed 22 May 1993, and entered into force 29 December 1993.

CBD is a global convention with 192 Parties (168 signatures).[66] All the Arctic states except for the United States are parties to the Convention.

Objectives

The objectives of CBD are i) the conservation of biological diversity ii) the sustainable use of its components and iii) the fair and equitable sharing of the benefits arising from the utilization of genetic resources.[67]

Geographical scope

The geographical scope of CBD is global. All provisions of CBD apply within the areas of states' jurisdiction. In the Arctic marine area, this includes the territorial sea, the EEZ and the continental shelf. The provisions of the CBD also apply for "processes and activities" carried out within national jurisdiction, regardless of where the effects occur, within or beyond the limits of national jurisdiction. This means that the obligations of CBD apply to processes and activities that take place within national jurisdiction but where their effects occur beyond national jurisdiction, such as on the high seas or the territory of other states.

The CBD does not include any particular provisions or principles relating to Arctic issues.

Functional scope

The Convention includes obligations to achieve the three objectives of conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the utilization of genetic resources. Biological diversity is covers the diversity within species, between species and of ecosystems.[68] The concept of biological diversity

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64 http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf, para. 29-31.

65 Convention on Biological Diversity (United Nations, *Treaty Series,* vol. 1760, p. 79).The text of the convention is available at www.biodiv.org

66 www.biodiv.org

67 Convention on Biological Diversity Article 1.

68 Convention on Biological Diversity Article 2.

therefore covers the variability of life. The Convention calls for general measures for conservation and sustainable use, and requires the parties to identify and monitor components of biological diversity and the effects of categories of activities that have or are likely to have significant adverse impacts on biodiversity.[69] Additionally, CBD includes more concrete obligations on in situ conservation measures and ex situ conservation measures.[70] Other provisions address research and training, public education and awareness, impact assessments, access to genetic resources and transfer of technology.

Reporting/enforcement mechanisms

The COP shall keep the implementation of the Convention under review. The Parties shall present reports of measures they have taken for the implementation of the provisions and their effectiveness in meeting the objectives of the Convention.[71]

The Convention on Wetlands of International Importance

The Convention on Wetlands of International Importance (the Ramsar Convention) was signed in 2 February 1971 and entered into force 21 December 1975.[72] It has 159 Contracting Parties.[73]

Objectives

The objective of the Ramsar Convention is to protect and conserve wetlands of international significance, and to promote the wise use of wetlands within the territories of the Contracting Parties.

Geographical scope

The Ramsar Convention is a global convention. All the Arctic states (8) have ratified the Convention.[74]

Functional scope

The States shall designate suitable wetlands within their territory for inclusion in a List of Wetlands of international importance, and the promote their conservation.[75] Further they have the obligation to promote conservation and wise use of wetlands and waterfowl in their territory.[76] The states shall furthermore coordinate and consult, in particular with respect to

[69] Convention on Biological Diversity, Articles 6,7 and 10.
[70] Convention on Biological Diversity, Articles 8 and 9.
[71] Convention on Biological Diversity, Article 26.
[72] The Convention on Wetlands of International Importance (United Nations, *Treaty Series,* vol. 996, p. 245). The official website of the convention is http://www.ramsar.org/cda/ramsar/display/main/main.jsp?zn=ramsar&cp=1_4000_0__
[73] Information from the official website http://www.ramsar.org/cda/ramsar/display/main/main.jsp?zn=ramsar&cp=1-36-123^23808_4000_0__
[74] 1996 Report PAME working group on the Protection of the Arctic Marine Environment, p. 68.
[75] The Ramsar Convention Articles 2 and 3.
[76] The Ramsar Convention Article 4.

a wetland that extends over the territory of more than one Contracting Party.[77]

Reporting/enforcement mechanisms
The Convention does not include any reporting or enforcement measures. The Conference of the Parties shall however, review and promote the implementation of the Convention. [78] The International Union for Conservation of Nature and Natural Resources shall be informed by the Contracting Parties of any changes in the ecological character of wetlands included in the List.[79]

Convention Concerning the Protection of the World Cultural and Natural Heritage
Convention Concerning the Protection of the World Cultural and Natural Heritage (The World Heritage Convention)[80] was signed 21 November 1972 (adopted 16 November 1972) and entered into force 17 December 1975. There are 186 States Parties to the Convention.[81]

Objectives
The objective of the Convention is to protect and conserve the world cultural and natural heritage.

Geographical scope
The World Heritage convention is a global convention. All Arctic states are parties to the Convention. There are at least ten designated world heritage areas in the region of Arctic.[82]

Functional scope
The Convention unites nature conservation and cultural heritage. The World Heritage Convention defines sites that are considered as cultural and natural heritage.[83] The Convention includes a duty for the states parties of ensuring the identification, protection, conservation, presentation, and transmission to future generations of the cultural and natural heritage situated within their territory.[84] Each State Party shall also endeavour to ensure that effective and active measures are taken for the protection, conservation and presentation of the cultural and natural heritage.[85] For example, States shall endeavour to adopt a general policy and integrate protection of cultural and natural heritage into comprehensive planning programmes. The World Heritage Convention also establishes that it is the duty of the international community as a whole to cooperate to protect

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[77] The Ramsar Convention Article 5.
[78] The Ramsar Convention Article 6.
[79] The Ramsar Convention Article 8.
[80] Convention Concerning the Protection of the World Cultural And Natural Heritage.
[81] April 2009, see http://whc.unesco.org/en/statesparties.
[82] See Linda Nowlan, Arctic Legal Regime for Environmental Protection, p 35, all areas are available at the http://whc.unesco.org/en/list
[83] The World Heritage Convention Articles 1 and 2.
[84] The World Heritage Convention Article 4.
[85] The World Heritage Convention Article 5.

cultural and natural heritage.[86]Furthermore, each State Party shall submit to the World Heritage Committee an inventory of property forming part of the cultural and natural heritage, situated in its territory and suitable for inclusion in the World Heritage List.[87]

Reporting/enforcement mechanisms
The States Parties shall report to the United Nations Educational, Scientific and Cultural Organization (UNESCO)[88] on the legislative and administrative provisions that they have adopted and other action which they have taken.[89]

Convention on International Trade in Endangered Species of Wild Fauna and Flora
Convention on International Trade in Endangered Species of Wild Fauna and Flora (The CITES Convention) was signed in Washington DC 3 March 1973.[90] It entered into force 1 July 1975. There are 175 member states to the Convention.[91]

Objectives
The objective of the treaty is to ensure that the fauna and flora, wild animals and plants are not threatened through international trade.

Geographical scope
The geographical scope of the Convention is global. All Arctic states are States Parties to the Convention but it does not have a particular focus on regions such as the Arctic. A number of the listed species are however, relevant to the Arctic region.[92]

Functional scope
The Convention includes three Appendices with listed species, categorised according to the degree of protection they need.[93]. Commercial trade with species that are threatened with extinction (Appendix I) is banned in most circumstances and requires export and import permits conditioned on various findings, such as that the trade will not be detrimental to the survival of the species.[94] Trade with species are not threatened now, but that may be threatened with extinction unless trade is subject to strict regulation (Appendix II), only require export permits with somewhat different criteria for issuing such permits.[95] Amendments to Appendices I and II are made by the Conference of the Parties. Decisions on listing of species in these appendices are made by the parties with a 2/3 majority and there is a right

[86] The World Heritage Convention Article 6.
[87] The World Heritage Convention Article 11.
[88] www.unesco.org
[89] The World Heritage Convention Article 29.
[90] Convention on International Trade in Endangered Species of Wild Fauna and Flora.
[91] See http://www.cites.org/eng/disc/parties/alphabet.shtml
[92] See Overview report: Multilateral Environmental Agreements and their relevance to the Arctic, September 2006, p. 13.
[93] www. http://www.cites.org/eng/disc/how.shtml
[94] The CITES Convention Article III.
[95] The CITES Convention Article IV.

to opt out with respect to listings.[96] As for Arctic species, several otters, fur seals, polar bear and all whales covered by the IWC whales moratorium are listed here.[97] Appendix III includes species which are subject to regulation in certain states, needing international cooperation to control trade. States can list species here unilaterally.[98] Canada has for instance listed the walrus.[99]

Reporting/enforcement mechanisms
States are obliged to report on all trade on species of flora and fauna that are listed in the Appendices.[100]

Convention on the Conservation of Migratory Species of Wild Animals
Convention on the Conservation of Migratory Species of Wild Animals (The Convention on Migratory Species)[101] was signed in Bonn 23 June 1979, and entered into force 1 November 1983. There are 113 parties to the Convention on Migratory Species.[102]

Objectives
The objective of the Convention is to conserve species of wild animals that migrate across national jurisdictional boundaries.

Geographical Scope
The Convention is a global convention, with no particular emphasis on Arctic issues. Nevertheless the ranges of many species covered by the Convention include Arctic areas.[103] Many species depend on Arctic ecosystems and habitats in parts of their lifecycles.[104] Four Arctic States are parties to the Convention; Denmark (excluding Greenland), Finland, Norway and Sweden.[105]

Functional scope
The major mechanism of the convention is to list species in two appendices and establish different obligations for their protection. Endangered species are listed in Appendix 1. States are required to conserve and restore the habitats of such species and, prevent, remove and minimise activities that are endangering or are likely to endanger the species, and also prevent, reduce or control factors that are endangering or likely to endanger such species.[106] The Range States shall generally also prohibit the taking of endangered species. Appendix II deals with migratory species that would

[96] The CITES Convention Article XV.
[97] See Linda Nowlan, Arctic Legal Regime for Environmental Protection, p. 29.
[98] The CITES Convention Article XVI.
[99] See Linda Nowlan, Arctic Legal Regime for Environmental Protection, p. 2.
[100] The Cites Convention Article VIII.
[101] Convention on the Conservation of Migratory Species of Wild Animals.
[102] January 2010, see http://www.cms.int/about/Partylist_eng.pdf
[103] Overview report: Multilateral Environmental Agreements and their relevance to the Arctic, September 2006, p. 10.
[104] Overview report: Multilateral Environmental Agreements and their relevance to the Arctic, September 2006,, p. 10.
[105] See http://www.cms.int/about/Partylist_eng.pdf
[106] The Convention on Migratory Species Article III.

benefit from international co-operation and which require international agreements for their conservation and management. [107]

Reporting/enforcement mechanisms

The Conference of the Parties shall review the implementation of the Convention. Each Party shall inform the Conference of the Parties of measures they are taking to implement the Convention. The Parties shall inform the Conference of the Parties of any exception made to the prohibition on taking of species listed in Appendix I.[108]

3.3.3 Chemicals

The Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention on POPs)

The Stockholm Convention[109] is a global convention dealing with persistent organic pollutants (POPs).

Objectives

Mindful of the precautionary approach, the objective of the Convention is as follows from Article 1 to protect human health and the environment from POPs.

Geographical scope

The Convention is a global treaty. The issues it deals with are however, closely linked to the Arctic as ecosystems and indigenous communities are recognized as being particularly at risk in the Preamble. Still, no specific mechanisms for the region are envisaged.[110] Denmark, with the territorial exclusion of the Faroe Islands and Greenland, Finland, Iceland, Norway, Sweden and Canada are parties to the Convention.[111]

Functional scope

The Stockholm Convention requires parties to prohibit production and use, and restrict trade, of certain listed POPs, including PCBs and various pesticides.[112] It also requires restrictions on production and use of DDT and measures to reduce emissions of certain other POPs including dioxins and furans. Substances that meet the criteria to be defined as POPs (persistence, bio-accumulation, long-range transport, and adverse effects) can be added to the lists in the Convention according to processes established in the Convention. In 2009, the Parties to the Convention

[107] The Convention on Migratory Species Article IV.

[108] The Convention on Migratory Species Article …

[109] The Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention on POPs). Official website http://chm.pops.int/

[110] Overview report: Multilateral Environmental Agreements and their relevance to the Arctic, September 2006, p. 14. See also David Downie and Terry Fenge, *Northern lights against POPs*, 2002.

[111] See http://chm.pops.int/Countries/StatusofRatification/tabid/252/language/en-US/Default.aspx

[112] The Stockhom Convention on POPS Article 3.

agreed to add nine new substances to the lists, and others are under evaluation.[113]

Reporting/ enforcement measures
The Conference of the Parties shall keep under continuous review and evaluation the implementation of the Convention.[114] Each Party shall develop and endeavour to implement a plan for the implementation of its obligations under the Convention.[115] Each Party shall also report to the Conference of the Parties on the measures it has taken to implement the provisions of this Convention and on the effectiveness of such measures in meeting the objectives of the Convention.[116]

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (the Basel Convention) was adopted in 1989 and came into force in 1992. It has 172 parties.[117]

Objectives
Although the Basel Convention does not specify its objectives, its main objectives have been described as follows: to reduce transboundary movements of hazardous wastes and other wastes to a minimum consistent with their environmentally sound management; to treat and dispose of hazardous wastes and other wastes as close as possible to their source of generation in an environmentally sound manner; and to minimize the generation of hazardous wastes and other wastes.[118]

Geographical scope
The scope of the convention is global. All the Arctic States except for the United States are Parties to the Convention. Denmark has made a territorial exclusion for the Faroe Islands and Greenland. The Convention does not include any specific regulations for the Arctic region, but it is relevant as Arctic ecosystems are at risk when hazardous wastes are mismanaged and enter into the environment.[119]

Functional scope
The general obligations of the Convention are listed in Article 4 and include a right for states to prohibit the import of hazardous wastes or other wastes

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[113] See http://chm.pops.int/Programmes/NewPOPs/Overview/tabid/667/language/en-US/Default.aspx
[114] Stockholm Convention on POPs Article 19.
[115] Stockholm Convention on POPs Article 7.
[116] Stockholm Convention on POPS Article 15.
[117] Information about the Basel Convention is available at http://www.basel.int/
[118] See guide to the implementation of the Convention http://www.basel.int/meetings/sbc/workdoc/manual.doc . See also Overview report: Multilateral Environmental Agreements and their relevance to the Arctic, September 2006, p. 15.
[119] Overview report: Multilateral Environmental Agreements and their relevance to the Arctic, September 2006, p. 15.

and an obligation on Parties to prohibit or not permit export to the Parties which have prohibited the import of such wastes. When a State has not prohibited the import of such wastes, parties shall still prohibit or not permit the export of hazardous wastes or other wastes to that State if it does not consent in writing to the specific import. The Convention also includes regulations on transboundary movement between the Parties.[120] Of significance here is that the State of export shall notify in writing of any proposed transboundary movement of hazardous wastes which the State of import shall respond to. The State of import may consent to the movement with or without conditions, deny permission or request additional information.

Reporting/ enforcement mechanisms
The Conference of the Parties shall keep under continuous review and evaluation the effective implementation of the Convention.[121] The Convention includes national reporting as a mechanism for monitoring the implementation of the Convention. Parties are required to transmit information i.e. of the regarding transboundary movements.[122]

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, London, 1972[123]
The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, known as the London Convention of 1972, is the primary international agreement controlling the deliberate dumping of non-ship generated wastes at sea. Since entering into force in 1975, the London Convention has provided a structure by which its now 77 contracting parties have made consistent progress in combating marine pollution caused by dumping at sea. The London Convention has become more restrictive over the years. In 1993, bans on the ocean disposal of low-level radioactive wastes and industrial wastes were adopted.

In 1996, a Protocol to the London Convention was adopted. The Protocol is a free-standing agreement to which both contracting and non-contracting parties to the London Convention may become party and is intended ultimately to replace the London Convention. The Protocol embodies a major structural revision of the Convention whereby Parties are obligated to prohibit the dumping of any waste or other matter that is not listed in its Annex 1 (the so-called "reverse list"). Dumping of wastes or other matter on the reverse list requires a permit. Parties to the Protocol are further obliged to adopt measures to ensure that the issuance of permits and permit conditions for the dumping of reverse list substances comply with Annex 2 (the Waste Assessment Annex) of the Protocol. There are eight categories of substances on the reverse list: dredged material; sewage sludge; fish waste; vessels and offshore platforms; inert, inorganic geological material; organic material of natural origin; and bulky items of unharmful materials for

120 Basel Convention Article 6.
121 Basel Convention Article 15.
122 Basel Convention Article 13.
123 http://www.imo.org/Conventions/contents.asp?topic_id=258&doc_id=681

which the concern is physical impact and is limited to those circumstances where such wastes are generated at locations with no practicable access to options other than dumping, and carbon dioxide streams from carbon dioxide capture processes for sequestration.

3.3.4 Climate and Atmosphere

United Nations Convention Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change[124] (UNFCCC) was adopted 9 May 1992 in New York and entered into force 21 March 1994.[125] There are currently 194 Parties to the Convention.[126] All the Arctic states have ratified the UNFCCC Convention.

Objectives

The Objective of the Convention is to achieve stabilization of the greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.[127]

Geographical Scope

The geographical scope of the Convention is global. Global conventions on atmosphere are of significance for the Arctic environment as the Arctic is particularly vulnerable to climate changes.

Functional Scope

The Convention contains principles that the Parties shall apply to achieve the objectives of the Convention. The Parties should according take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.[128] The Convention contains commitments to adopt policies and measures to achieve the objectives of the Convention. Among other things Parties are required to develop national inventories of their greenhouse gas emissions and removals, to formulate and implement programmes containing to mitigate climate change and to promote and cooperate in the development and application of technologies, practices and processes that control, reduce or prevent emissions of greenhouse gasses.[129]

Reporting/Enforcement mechanisms

All Parties must report on their national inventories and submit national communications. Annex I Parties follow a robust system of reporting and expert panel review of their inventories and national communications. In addition, the COP keeps under regular review the implementation of the Convention.[130]

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[124] United Nations, *Treaty Series*, vol. 1771, p. 107.
[125] Information about the Convention is available at http://unfccc.int/2860.php
[126] See http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php
[127] UNFCC Article 2.
[128] UNFCCC Article 3.
[129] UNFCC Article 4.
[130] UNFCCC Article 7.

Kyoto Protocol

General:

The United Nations Framework Convention is complemented with the Kyoto Protocol[131], adopted in 1997. The Kyoto Protocol entered into force 16 February 2005 and there are currently 191 Parties to the Protocol.[132] All the Arctic states with the exception of the US have ratified the Kyoto Protocol.

Objectives:

The objective of the Kyoto Protocol is to achieve the objective of the UNFCCC to stabilize greenhouse-gas concentrations in the atmosphere through binding targets for reducing greenhouse-gas emissions.

Geographical Scope:

The geographical scope of the Kyoto Protocol is global.

Functional Scope

Under the Kyoto Protocol the Parties are required to meet specific targets for the reduction of greenhouse gasses.[133] Hereby States are required to, individually or jointly, ensure that emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of Article 3, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 – 2012.[134] Parties to the Protocol shall mainly achieve the targets through national measures but may also apply three marked based mechanisms.[135] The Kyoto flexibility mechanisms are emission trading (Article 17), clean development mechanism (Article 12) and joint implementation (Article 6).

Reporting/Enforcement mechanisms

The Conference of the Parties is required to meet regularly and keep under regular review the implementation of the Protocol and shall make decisions necessary to promote its effective implementation.[136]

Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on substances that deplete the Ozone Layer

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[131] United Nations, *Treaty Series* , vol. 2303, p. 148;

[132] http://treaties.un.org/pages/ViewDetails.aspx?src=UNTSONLINE&tabid=2&mtdsg_no=XXVII-7-a&chapter=27&lang=en#1

[133] About the Kyoto Protocol see http://unfccc.int/kyoto_protocol/items/2830.php

[134] Kyoto Protocol Article 3 (1).

[135] http://unfccc.int/kyoto_protocol/items/2830.php

[136] Kyoto Protocol Article 13. Birnie et. al argue that the supervisory role of the parties under the UNFCCC and the Kyoto Protocol is considered to be among the most elaborate in any environmental treaty and that they include significant innovations to ensure effective implementation, see Birnie, Boyle and Redgwell, International Law & The Environment, p. 368-370, 2009.

The Vienna Convention on the Protection of the Ozone Layer[137] was adopted in 1985 and entered into force in 1988. There are 196 Parties to the Convention.[138] The Montreal Protocol on substances that deplete the Ozone Layer[139] was adopted in 1987 and entered into force in 1996.[140] There are 196 Parties to the Protocol.[141]

Objectives
The Convention aims to protect the human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer. The objective of the Montreal Protocol is the elimination of ozone-depleting substances.

Geographical scope
The geographical scope of the Convention and the Protocol is global. All Arctic states are parties to both the Convention and the Protocol.

Functional scope
The Convention contains a general obligation to take appropriate measures to achieve the objective of the Convention.[142] Hereby the Parties are required to adopt appropriate legislative or administrative measures to and co-operate in harmonizing appropriate policies to control, limit, reduce or prevent human activities that have or are likely to have adverse effects resulting from modification or likely modification of the ozone layer.[143] Additionally Parties are required to co-operate in the legal, scientific and technical fields and to transmit information about the measures adopted in implementing the Convention and Protocols.[144] The Montreal Protocol sets targets for reducing and eliminating consumption and production of a range of ozone-depleting substances.[145]

Reporting/enforcement mechanisms
The Conference of the Parties shall keep the Convention under continuous review the implementation of the Convention.[146] The Protocol provides for a formal non-compliance procedure.

3.4 Fisheries

3.4.1 Introduction

[137] United Nations, *Treaty Series* , vol. 1513, p. 293.
[138] http://treaties.un.org/pages/ViewDetails.aspx?src=UNTSONLINE&tabid=2&mtdsg_no=XXVII-2-a&chapter=27&lang=en#7
[139] United Nations, *Treaty Series* , vol. 1522, p. 3.
[140] Information about the Convention and the Protocol is available at http://ozone.unep.org/ .
[141] http://ozone.unep.org/Ratification_status/
[142] Article 2 (a).
[143] Article 2 (2) a).
[144] Articles 4 and 5.
[145] The text and iinformation about the Protocol is available at at http://ozone.unep.org/.
[146] Article 6.

At the global level, LOSC and the UN Fish Stocks Agreement (UNFSA) are the key treaties setting out the legal framework for the management of fisheries. Also treaties and other arrangements negotiated under the auspices of the FAO are important here.

LOSC codifies the coastal State´s sovereign rights for the purpose of exploring and exploiting, conserving and managing the fish stocks of the EEZ. These rights are subject to a number of restrictions/duties, among them: to have due regard to the rights and duties of other States and act in a manner compatible with the provisions of the convention,[147] and, taking into account the best scientific evidence available to it, to ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation.[148] As appropriate, the coastal State and competent international organizations, whether subregional, regional or global, shall co-operate to this end. In taking conservation measures the coastal State shall take into consideration the effects on species associated with or dependent upon harvested species with a view to maintaining or restoring populations of such associated or dependent species above levels at which their reproduction may become seriously threatened.[149]

Further LOSC contains some provisions about utilization, inter alia that the coastal State is required to promote the objective of optimum utilization of the living resources.[150]

The coastal State is given a broad discretion in deciding which other States´ fishermen are to be given access to its fisheries resources. LOSC contains provisions regarding enforcement of laws and regulations of the coastal State.[151]

On the high seas, the fishing states are to respect certain conditions, primarily the duty to take such measures for their respective nationals as may be necessary for the conservation of the living resources and the duty to cooperate with other states in the conservation and management of living resources.[152]

3.4.2 *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA)*[153]

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[147] LOSC article 56 (2).
[148] LOSC article 61 (2).
[149] LOSC article 61 (4).
[150] LOSC article 62 (1).
[151] LOSC article 73.
[152] LOSC article 117 and 118.
[153] http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXI-7&chapter=21&lang=en (9 December 2009)

The UNFSA was adopted in 1995 and entered into force in 2001. There are 77 parties, among them the 8 arctic States.

Objective
UNFSA is an implementing agreement of the provisions in LOSC regarding to the conservation and management of straddling and highly migratory fish stocks. Therefore article 2 of the UNFSA provides that "[t]he objective of this Agreement is to ensure the long-term conservation and sustainable use of straddling fish stocks and highly migratory fish stocks through effective implementation of the relevant provisions of the Convention."

Geographical scope
The scope of application of UNFSA is global.

Functional scope
The convention applies to the conservation and management of straddling fish stocks and highly migratory fish species beyond areas under national jurisdiction. However, the agreement sets out principles which should govern the conservation and management of straddling and highly migratory fish stocks both by the coastal State within its EEZ and by all States on the high seas. These principles include inter alia: the precautionary approach and to ensure compatibility between the measures within an EEZ and on the high seas.[154]

It should also be mentioned that UNFSA expresses the principle of ecosystem-based management: "In order to conserve and manage straddling fish stocks and highly migratory fish stocks, coastal States and States fishing on the high seas shall, in giving effect to their duty to cooperate in accordance with the Convention: adopt, where necessary, conservation and management measures for species belonging to the same ecosystem or associated with or dependent upon the target stocks, with a view to maintaining or restoring populations of such species above levels at which their reproduction may become seriously threatened."[155]

In part III UNFSA affirms the duty to cooperate and evolves mechanisms for international cooperation concerning straddling and highly migratory fish stocks. Where an organisation/arrangement already exists (such as NEAFC and NAFO), it is to be used. Where no organisation/arrangement exists, States fishing on the high seas shall establish one. The organisation (RFMO) or the arrangement (RFMA) are to establish conservation and management measures to ensure the long-term sustainability of straddling fish stocks and highly migratory fish stocks. The RFMO/RFMA also shall establish appropriate cooperative mechanisms for effective monitoring, control, surveillance and enforcement.

In part VI UNFSA contains provisions on compliance and enforcement. U UNFSA imposes the flag State (a State whose vessels fish on the high

[154] UNFSA article 6 and 7.
[155] UNFSA article 5 (e).

seas) to ensure compliance by its vessels with subregional and regional conservation and management measures for straddling and highly migratory fish stocks. To this end, that State shall inter alia enforce such measures irrespective of where violations occur.[156] In addition UNFSA oblige RFMOs/RFMAs to establish schemes whereby one member State can board and inspect vessels of any State part to the UNFSA, even if the flag State is not a member of the relevant RFMO/RFMA.[157] If within two years of the adoption of UNFSA such schemes have not been adopted, UNFSA itself authorises one member State of RFMO/RFMA to carry out such enforcement.[158]

3.4.3 *Agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas (FAO Compliance Agreement*)[159]
The agreement was adopted in 1993, and entered into force in 2003.

Objective
The objective is to promote compliance with international conservation measures on the high seas.

Geographical scope
The scope is global, as the agreement applies to all fishing vessels that are used or intended for fishing on the high seas.

Functional scope
The Agreement applies to fisheries on all types of stocks on the high seas, not only the ones regulated by the UNFSA. It primarily stresses that flag states take necessary measures to ensure that fishing vessels entitled to fly its flag do not engage in any activity that undermines the effectiveness of international conservation and management measures. Regarding enforcement, the flag state shall take measures in respect of fishing vessels which act in contravention of the provisions of the agreement. Sanctions applicable shall be of sufficient gravity as to be effective in securing compliance, and shall, for serious offences, include refusal, suspension or withdrawal of the authorization to fish on the high seas.

FAO Compliance Agreement further imposes the State Parties to cooperate on enforcement. The States shall, in particular, exchange information, including evidentiary material, relating to activities of fishing vessels in order to assist the flag State in identifying those fishing vessels flying its flag reported to have engaged in activities undermining international conservation and management measures. When a fishing vessel is voluntarily in the port of a Party other than its flag State, that Party, where it has reasonable grounds for believing that the fishing vessel has been used for an activity that undermines the effectiveness of international

[156] UNFSA article 19 (1).
[157] UNFSA article 21 (1) and (2).
[158] UNFSA article 21 (3).
[159] ftp://ftp.fao.org/docrep/fao/Meeting/006/x3130m/X3130m00.pdf (15

conservation and management measures, shall promptly notify the flag State accordingly.

3.4.4 *Agreement on port state measures to prevent, deter and eliminate illegal, unreported and unregulated fishing (FAO Port State Agreement)*

The Agreement was adopted in Rome in November 2009, and enters into force thirty days after the date of deposit with the Depositary of the twenty-fifth instrument of ratification, acceptance, approval or accession.

Objective
The objective is to prevent, deter and eliminate illegal, unreported and unregulated fishing (IUU-fishing) through the implementation of effective port State measures, and thereby to ensure the long-term conservation and sustainable use of living marine resources and marine ecosystems.

Geographical scope
FAO Port State Agreement is global in scope and applies to all ports.

Functional scope
The Parties, as they have expressed in the preamble, took note of the calls by UNGA and FAO for a binding international instrument on minimum standards for port State measures, based on IPOA-IUU (see under) and the 2005 FAO Model Scheme on Port State Measures to combat IUU-fishing. The Parties further recalled UNFSA, FAO Compliance Agreement and FAO Code of Conduct for Responisble Fisheries.

By recognising that port State measures are widely viewed as one of the best and most efficient ways to fight IUU-fishing, the Agreement include among other factors:

Foreign fishing vessels wishing to dock, will be required to request permission from designated ports ahead of arrival, transmitting information on their activities and the fish they have on board. The flag state must assure that the fish is caught legally before it can be brought ashore. The port state can deny a ship access to its ports.

Port States shall conduct inspections of ships according to common standards, in order to reveal if it has engaged in IUU-fishing. When a vessel is denied access or found guilty in IUU-fishing, port states must communicate that information to the flag State. The flag State is responsible for follow-up action.

3.4.5 *The Code of Conduct for Responsible Fisheries*[160] – FAO

The Code of Conduct is a voluntary instrument *(soft law)*. However, certain parts of it are based on relevant rules of international law, including those reflected in LOSC. The code also contains provisions that may be or have

[160] http://www.fao.org/DOCREP/005/v9878e/v9878e00.htm

already been given binding effect by means of other legally binding instruments, such as the FAO Compliance Agreement (1993), which forms an integral part of the Code.

Geographical scope
Code of Conduct has a global scope of application. FAO request all states to implement certain measures in order to achieve a responsible fisheries management.

Functional scope
Among other factors the code contains several concepts and principles States should make use of, including ecosystem-based management, international cooperation and the precautionary principle.

The code has given rise to and is implemented through a number of international plans of action:

- International plan of action to prevent, deter and eliminate illegal, unreported and unregulated fishing (IPOA-IUU)[161] – FAO 2001.

- International plan of action for reducing incidental catch of seabirds in longline fisheries (IPOA-SEABIRDS)[162] – FAO 1999.

- International plan of action for the conservation and management of sharks (IPOA-SHARKS) – FAO[163] 1999

- International plan of action for the management of fishing capacity (IPOA-CAPACITY) – FAO[164] 1999

3.4.6 *International Convention for the Regulation of Whaling*
The Convention was adopted in 1946, and entered into force in 1948.

The International Whaling Commission (IWC) has 88 parties, among them the arctic States Finland, Denmark, Iceland, Norway, Russia, Sweden and USA. Canada has withdrawn from the convention.

Objective
The convention was concldduded to provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry.

Geographical scope
Global

Functional scope

[161] http://www.fao.org/DOCREP/003/y1224e/y1224e00.htm
[162] http://www.fao.org/fishery/ipoa-seabirds/legal-text/en
[163] http://www.fao.org/fishery/ipoa-seabirds/legal-text/en
[164] http://www.fao.org/fishery/ipoa-seabirds/legal-text/en

The Convention establishes an International Whaling Commission with powers to regulate whaling through the setting of total quotas, seasonal and regional regulations, etc. for the large whale species. The Commission has a scientific committee which recommends management measures.

3.5 Shipping

3.5.1 Introduction

In relation to shipping, the main obligations on environmental protection and the jurisdictional rights are established by the LOSC. The global regulatory regime on maritime traffic, safety at sea, and on vessel source pollution is developed and adopted by other international bodies and in other instruments, outside the LOSC. In some cases, regulations also become legally binding on Parties to the LOSC, by operation of the rules of reference in LOSC, the references to "generally accepted international rules and standards adopted through the competent international organization or general diplomatic conference" (GAIRS).[165] Regulations of navigation, safety at sea, and vessel source pollution are primarily developed through the International Maritime Organisation (IMO).[166] IMO was established as a specialized agency under UN in 1948 for the purpose of i.a. improving maritime safety and security and for preventing marine pollution.[167] Also EU has in recent years become increasingly active in regulating maritime safety and marine pollution. The most relevant and important IMO conventions and instruments for the purpose of the protection of the Arctic marine environment are reviewed below.

Most of the provisions of the Law of the Sea Convention on vessel source pollution are contained in Part XII. According to Article 211 (2) flag States shall adopt laws and regulations for the prevention, reduction and control of pollution of the marine environment from vessels flying their flag or of their registry. These regulations shall "at least have the same effect" as that of GAIRS.[168]

The coastal States have a wide competence to adopt regulations on shipping within their territorial sea for the purpose of protecting the marine environment pursuant to Article 21, 22 and 211 (4). Such regulations must however not hamper the right of innocent passage.[169] In the Exclusive Economic Zone the competence of the coastal State to adopt regulations on shipping is more limited. Pursuant to Article 211 (5) coastal States may adopt laws and regulations that are "conforming to and giving effect" to GAIRS. Furthermore coastal States have enhanced jurisdiction to adopt stricter regulations within special areas in some circumstances through particular procedures.[170] Moreover, Article 234 is of particular relevance for the Arctic marine area as it provides the coastal States the right to adopt

[165] Such as the Law of the Sea Convention Articles 21 (2), 22 (3) and 211 (5) and (6).
[166] For information about IMO see www.imo.org.
[167] The 1948 IMO Convention.
[168] The Law of the Sea Convention Article 211 (2).
[169] The Law of the Sea Convention Article 24 (1).
[170] The LAW of the Sea Convention Article 211 (6).

and enforce certain additional marine pollution measures provided that they meet the various requirements set forth in this article relating to, inter alia, non-discrimination, ice coverage, and navigation.

3.5.2 The IMO conventions
A number of legally binding and non legally binding instruments on maritime safety and vessel source pollution have been adopted by the IMO.[171]

Legally binding IMO instruments of relevance for shipping in the Arctic:[172]

- *Convention on the International Regulations for Preventing Collisions at Sea (COLREG), 1972.*
- *International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), 1973.*
- *International Convention for the Safety of Life at Sea (SOLAS), 1974.*
- *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978.*
- *International Convention for the Control and Management of Ships` Ballast Water and Sediments (BWMC), 2004.*
- *International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS), 2001.*
- *International Convention on Oil Pollution, Preparedness, Response and Co-operation (OPRC), 1990 and the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (HNS Protocol), 2000.*
- *International Convention on Civil Liability for Oil Pollution Damage (CLC), 1969*
- *International Convention on the Establishment of an International Fund for Compensation of Oil Pollution Damage (FUND), 1971*
- *International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances at Sea, 1996 and the 2010 HNS Protocol.*

Non legally binding IMO instruments of relevance for shipping in the Arctic:
- *General Provisions on Ships Routeing*
- *PSSA Guidelines*
- *Arctic Shipping Guidelines*

International Convention for the Safety of Life at Sea (SOLAS)
General
The SOLAS Convention[173] was signed 1 November 1974 and entered into force 25 May 1980.[174]

[171] Information about these instruments are available at www.imo.org .
[172] The list is provided by Molenaar and Koivorova in International Governance and Regulation of the Marine Arctic p. 23.
[173] The International Convention for the Safety of Life at Sea.
[174] Earlier versions of the Convention were adopted in 1914, 1929, 1948 and in 1960. Abut the history of the Convention see www. imo.org

Objective
The objective of the Convention is to improve the safety of shipping.

Geographical scope
The Convention is global, and all the Arctic states have ratified it.

Functional scope
The SOLAS Convention and its protocols include regulations on construction, equipment and operation of vessels. In addition the Convention includes regulations on stability, fire detection and fire fighting, communication, regulations on the carriage of dangerous goods etc.[175] In relation to protection of the marine environment the regulations for ensuring safety of navigation are of significance. In this regard a chapter V includes regulations on safety of navigation, routeing measures, ship reporting systems and vessel traffic services. [176]

International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 relating thereto (MARPOL73 /78)
General
The International Convention for the Prevention of Pollution from Ships (MARPOL) entered was adopted 2 November. A protocol to the Convention was adopted 17 February 1978. The Convention entered into force in 1983.[177]

Objectives
The objectives of the Convention are to eliminate pollution of the sea by oil, chemicals and other harmful substances which might be discharged to the sea and air in the course of operation. To minimize the amount of oil which could be released accidentally in collisions or groundings by oil tankers, the Convention require double hull and double bottom for oil tankers above a specified size.

Geographical scope
The Convention is global. Certain areas are designated as special areas in which stricter regimes for prevention of discharges are adopted. The Antarctic is designated as a special area, but not the Arctic.

Functional scope
The Convention is aimed at preventing pollution from ships to the sea and to the air. Its technical content is laid out in six Annexes, the first five relating to pollution of the sea, the sixth covers air pollution from ships. The five first Annexes covers pollution by oil, by noxious liquid substances in bulk, by harmful substances carried by sea in packaged form, by sewage from ships and by garbage from ships. Annex VI was adopted in 1997 and revised in

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[175] See www.imo.org
[176] See in particular regulations 10, 11 and 12 in chapter V. Chapter V was part of the amendments of the Convention which took place during the 1990s. Chapter V was revised in 2000. For an overview of the amendments see www.imo.org.

2009. Annex V is currently under revision and is expected to be adopted by IMO in 2010.

The 1972 Convention on International Regulations for Preventing Collisions at Sea (COLREG)
General
COLREG was adopted 20 October 1972 and entered into force 15 July 1977.[178]

Geographical Scope
The Convention is global with 153 Parties.

Functional Scope
The COLREG Convention is of particular relevance in relation to the regulation of navigation as it includes regulations of traffic separation schemes. This is a frequently applied routeing measure which is a relevant measure for avoiding ship collisions. Traffic separation schemes are dealt with in COLREG rule 1 (d) and 10 and may be made mandatory for its parties.

International Convention for the Control and Management of Ships` Ballast Water and Sediments (BWMC)
The Ballast Water Convention was adopted 13 February 2004 and is not entered into force yet.[179] The Convention will enter into force 12 months after ratification of 30 Parties corresponding to 35% of world tonnage.. Currently (April 2010) the convention is ratified by 24 states (23%)..[180]

Geographical scope
The Convention is global.

Functional scope
The BWMC is aimed at preventing the transfer of harmful aquatic organisms and pathogens through ships´ ballast water and sediments. In order to meet the demands, the Convention offers two main options, the D-1 standard: Ballast Water Exchange and the D-2 standard: Ballast Water Performance. According to D-1 ballast water exchange has to be performed at 200 m depth and 200, alternatively 50, nautical miles from land. The D-2 standard regulates the use of treatment systems for cleansing the ballast water. The released and treated ballast water has to comply with the demands put forward in standard D-2 regarding numbers, types and size classes of organisms. Ships constructed in 2009 and subject to Regulation B-3.3 have to meet the requirements in Regulation D-2 at the latest at their second annual survey, but before 31 December 2011.

3.5.3 Non legally binding IMO instruments

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[179] Information about the Convention is available at www.imo.org.
[180] Information available at http://www.imo.org/ .

Ships routeing measures
IMO has the competence to adopt routeing regulations for ships and has developed guidelines and criteria for ships` routeing systems. The regulations of the ships routeing were amended in 1995 where the application of these measures for the purpose of protecting the marine environment was clarified.[181] The instrument includes both substantive and procedural regulations for the routeing measures. The measures adopted in the Guidelines are not legally binding. However, SOLAS includes a legal basis for adopting mandatory routeing measures.

PSSA Guidelines
PSSA (Particularly Sensitive Sea Area) is an area of the sea that needs special protection through action of IMO. The concept of PSSA is developed through IMO practice since the 1970s and adopted on the basis of Guidelines.[182] These Guidelines do not have any binding force and the concept of of PSSA is in itself not legally binding. The PSSAs consist however, of protective measures which may have a legal basis in the MARPOL Convention, the SOLAS Convention or in any other mandatory IMO instrument. The protective measures adopted to ensure the protection of the sensitive area designated as a PSSA may therefore be legally binding**.**

Arctic Shipping Guidelines
Guidelines for ships operating in Ice-covered waters were adopted by IMO in 2009.[183] This is the only IMO instrument that is tailored to the Arctic. The Guidelines are adopted for the purpose of addressing additional provisions deemed necessary for ships operating in ice-covered waters, beyond existing requirements of the SOLAS Convention, the MARPOL Convention and other relevant conventions and codes in order to take into account the climatic conditions of these waters and to meet appropriate standards of maritime safety and pollution prevention. The Guidelines include provisions to promote the safety of navigation and to prevent pollution from ship operations in Arctic ice-covered waters, and are currently recommendatory.[184] Based on i.a. the above mentioned guidelines, IMO has initiated the development a mandatory polar code with a target date of 2012.

3.6 Marine Science

General
The law of the Sea Convention contains provisions that define the scope of the competence to carry out scientific research in the different maritime zones. Part XIII of the Convention regulates the right of all states to conduct marine scientific research and the competence of the coastal State to

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[181] General Provisions on Ships Routeing (IMO Resolution A.572(14)).
[182] Revised Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas (IMO Assembly Resolution A.982(24)).
[183] Guidelines for Ships Operating in Arctic Ice-Covered Waters MSC/Circ.1056/MEPC/Circ.399 were adopted by the IMO Assembly 2009 (res.A. 1024 (26).
[184] See http://www.imo.org/ .

regulate this activity within their jurisdiction. Before the adoption of the Law of the Sea Convention, under the Geneva Convention, marine scientific research was generally regarded as a part of the freedom of the high seas.[185] As it is acknowledged that scientific research is a precondition both for the conservation and management of marine resources, marine scientific research is more comprehensively regulated in the Law of the Sea Convention. Scientific research is thus basis for activities such as exploitation of oil, use of genetic resources, and management of fish stocks and conservation of marine biodiversity. The starting point is the all states, subject to rights and duties of other States have the right to conduct marine scientific research.[186] This right is connected with a corresponding duty to promote and facilitate the development and conduct of marine scientific research.[187] The Law of the Sea Convention also sets forth general principles that shall apply in the conduct of marine scientific research.[188]

Territorial Seas and internal waters
Coastal States have sovereignty over the territorial sea and the internal waters. The Coastal States have therefore the exclusive right to regulate, authorize and conduct marine scientific research in their territorial sea. It follows explicitly from the Convention that marine scientific research in this zone may only conducted with the consent of and under the conditions set forth by the coastal State.[189]

Exclusive Economic Zone and Continental shelf
In the EEZ the coastal States have jurisdiction with regard to marine scientific research.[190] Consequently, coastal States have the right to regulate, authorize and conduct marine scientific research in the EEZ. Such research shall be conducted with the consent of the coastal State. The competence of the coastal State is however; more limited in the EEZ than in the territorial sea as coastal States “in normal circumstances” shall grant their consent for marine scientific research carried out exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment.[191] The conduct of marine scientific research in a foreign state’s EEZ or continental shelf is subject to a number of obligations such as a duty to provide information and to comply with certain circumstances.[192]

High Seas
Marine scientific research is specifically referred to as a freedom of the sea in Article 87. The freedom to conduct research is however, not unlimited and is subject to the regulations in Part VI and XIII. States must also carry out

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[185] See Churchill and Lowe, The Law of the Sea, 1999, p.401-403.
[186] Law of the Sea Convention, Article 238.
[187] Law of the Sea Convention , Article 239.
[188] Law of the Sea Convention, Article 240 .
[189] Law of the Sea Convention, Article 245.
[190] Law of the Sea Convention ,Article 56.
[191] Law of the Sea Convention Article 246. Article 246 makes a distinction here between pure and applied research, about this see Churchill and Law, The Law of the Sea, 1999, p. 405-406.
[192] Law of the Sea Convention, Articles 248-249.

this activity with due regard to the interests of other states in their exercise of the freedom of the high seas.[193]

Intergovernmental Oceanographic Commission, 1960

The Intergovernmental Oceanographic Commission (IOC) promotes marine scientific investigations to learn more about the nature and resources of the oceans and provides related ocean services and training. The IOC plans, coordinates, and supports global and regional programs, in cooperation with IOC member states and other international organizations. The IOC is recognized as the competent international organization for marine scientific research under the LOSC. It also has specific responsibilities relating to the Framework Convention on Climate Change, the Convention on Biodiversity, Agenda 21 of the UN Conference on Environment and Development, and the International Decade for Natural Disaster Reduction.

Through memoranda of understanding, the IOC cooperates with ICES in the North Atlantic, and with the North Pacific Marine Science Organization **(**PICES) in the North Pacific region. UN agencies that work closely with the IOC on programs of mutual interest include the World Meteorological Organization, the UNEP, the International Maritime Organization, the FAO, and the International Atomic Energy Agency. Scientific advice is provided to the IOC by the Scientific Committee on Oceanic Research of the International Council of Scientific Unions. Major programs include study of global ocean circulation, ocean mapping, and global ecosystem dynamics. Under each of these program areas and in cooperation with national and international agencies, the IOC sponsors and organizes meetings and workshops to define scientific problems and service requirements, and to develop appropriate international programs. The programs are executed by the participating IOC member states.

3.7 Oil and gas activities

The starting point for the global regulation of oil and gas activities is the coastal state jurisdiction over the resources at the continental shelf. Coastal states have the sovereign rights over “the mineral and other non-living resources” at the seabed which covers the exploitation of oil and gas resources.[194] The general obligations of LOSC to protect and preserve the marine environment are of significance when States engage in oil and gas activities.[195]

In addition, LOSC contains an obligation to prevent pollution from sea bed activities. Coastal States are required to adopt laws and regulation to prevent, reduce and control such pollution of the marine environment arising from or in connection with seabed activities subject to their jurisdiction. Moreover the states shall take other measures as may be necessary to prevent, reduce and control such pollution.[196]

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[193] Law of the Sea Convention, Article 87 (2).

[194] The Law of the Sea Convention Article 77.

[195] The Law of the Sea Convention Article 192 and 194.

[196] The Law of the Sea Convention Article 208.

Also, the MARPOL Convention and the London Dumping Convention cover certain forms of operational pollution from continental shelf installations.

There is however, no global comprehensive treaty that regulates pollution from offshore oil and gas activities.[197] A soft law instrument, guidelines for state practice with regard to offshore mining and drilling is however, developed through UNEP.[198]

3.8 Conclusions

[197] Churchill and Lowe, The Law of the sea, 1999, p. 371.
[198] http://www.unep.org/law/PDF/UNEPEnv-LawGuide&PrincN04.pdf, about the Guidelines see Churchill and Lowe, The Law of the sea, 1999, p. 371-372.

Chapter 4: Regional instruments pertaining partly or fully to the Arctic marine environment

4.1 Introduction
4.2 Environment
- 4.2.1 Convention on Long-range Transboundary Air Pollution (LRTAP)
  The Convention on Long-range Transboundary Air Pollution
- 4.2.2 Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- 4.2.3 Memorandum of Understanding (MoU) between NEAFC and OSPAR Commission (1998)
- 4.2.4 Convention on the Protection of the Marine Environment of the Baltic Sea
- 4.2.5 The Polar Bear Agreement (1973)

4.3 Fisheries
- 4.3.1 Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea ("Donut Hole Agreement"), 1994
- 4.3.2 Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean (Basic Instrument for the North Pacific Anadromous Fish Commission – NPAFC) (1992)
- 4.3.3 Convention on Future Multilateral Co-operation in North-East Atlantic Fisheries (NEAFC Convention)
- 4.3.4 1979 Conventionon on Future Multilateral Cooperation in the Northwest Atlantic Fisheries (NAFO Convention)
- 4.3.5 Agreement on Cooperation in Research, Conservation and Management of Marine Mammals in the North Atlantic (NAMMCO Agreement)
- *4.3.*6 Convention for the Conservation of Salmon in the North Atlantic Ocean, 1982
- 4.3.7 Other regional fisheries arrangements

4.4 Science
- 4.4.1 Convention for a North Pacific Marine Science Organization (PICES),
- 4.4.2 Convention for the International Council for the Exploration of the Sea
- 4.4.3 The International Arctic Science Committee (IASC) and the International Association of Social Scientists in the Arctic (IASSA)

4.5 General cooperation
- 4.5.1 The Ottawa Declaration
- 4.5.2 The Ilulissat Declaration (2008)
- 4.5.3 The Svalbard Treaty
- 4.5.4 The Barents Region Cooperation

4.1 Introduction

This chapter addresses the measures for the marine environment that apply at a regional level. Broadly speaking, there are three marine regions in the Arctic: the North Atlantic, the North Pacific and the Central Arctic ocean. The first two of these regions span vast areas also to the south of the Arctic, with a number of regional agreements that apply to these regions per se. This chapter reviews the measures that apply in the North Pacific and the North Atlantic; chapter 5 deals with measures that apply to the Arctic only.

The northern areas of these two regions are different in a number of respects that are important to the Arctic marine environment and its management. First, the Northeast Atlantic is heavily influenced by the Atlantic current, which carries warm water from the southwest to the northeast in the region. The Northeast Atlantic therefore has a substantially warmer climate than other regions at the same latitude. This affects ecosystems, which range from boreal to polar in nature within the area perceived as Arctic.

Second, and for that reason, most of the four million people in the Arctic live in the Northeast Atlantic region, in particluar in Northwest Russia and the Nordic countries.[200] Here, urban populations and substantial economic activity is found up to more than 70 degrees north.

Also, the Norteast Atlantic is downstream from major population centers in Europe, which exposes the region to pollution carried with ocean currents and air.

The “Arctic” parts of the Northeast Atlantic have a more benign climate than that of the Pacific. For that reason this region is more populated, have more economic activities, and therefore also more international cooperation on

[199] http://www.unece.org/env/eia/
[200] Arctic Human Development Report 2004, xxx

regulating such activities. There are also a larger number of countries involved; all of the Arctic countries border on the North Atlantic.

4.2 Environment

Regional, environmental instruments that pertain to the Arctic marine environment are largely confined to the North Atlantic.

4.2.1 Convention on Long-range Transboundary Air Pollution (LRTAP)

The Convention on Long-range Transboundary Air Pollution was adopted 13 November 1979 and entered into force 16 March 1983. [201]

Objectives

The objectives of the Convention are to protect human beings and their environment against air pollution and to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution.

Membership

The Convention currently has 51 Parties. The eight Arctic countries are Parties to the Convention. (Canada, Denmark with a territorial exclusion in respect of the Faroe Islands and Greenland, Finland, Iceland, Norway, Sweden, Russian Federation and the United States).[202]

Geographical scope

The Convention is regional. It covers the UNECE – region, which includes Europe and parts of North America and Central and Western Asia. The Convention is of significance for the Arctic as the Arctic environment, its ecosystems and the indigenous communities are at risk from the long-range air pollution.

Functional Scope

The Convention establishes a framework under which parties can cooperate to reduce air pollution, including through exchange of information, research, monitoring, and policy development. Eight protocols to the Convention establish obligations with respect to specific pollutants such as sulphur, nitrogen oxides, heavy metals, persistent organic pollutants, and volatile organic compounds. Several specifically mention the Arctic; for example, the 1998 Protocol on Persistent Organic Pollutants includes an acknowledgment of the particular risks to Arctic ecosystems and indigenous people from the biomagnification of persistent organic pollutants.

Reporting/enforcement mechanisms

The Executive Body of the Convention shall review the implementation of the Convention. The protocols also include reporting requirements.

[201] http://www.unece.org/env/lrtap/lrtap_h1.htm

[202] See http://www.unece.org/env/lrtap/status/lrtap_st.htm

4.2.2 Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)

The OSPAR Convention was adopted in 1992 and came into force in 1998.[203]

Objectives

The Preamble states that the parties recognise the vital importance of the marine environment and the flora and fauna for all nations and the inherent worth of the marine environment. It is also expressed as an objective to prevent and to eliminate marine pollution and to achieve sustainable management of the maritime area and to ensure the management of human activities in such a manner that the marine ecosystems will continue to sustain legitimate uses of the sea and will continue to meet the needs of present and future generations.

Geographical scope

The Convention is regional and concerns the marine environment of the North East Atlantic. The area covers roughly the Atlantic sector of the Arctic marine area, "but about half extends further south"[204] The geographical scope of the OSPAR is described in Article 1 and extends to the east coast of Greenland in west, south to the Straits of Gibraltar and to the North Pole in the north. Finland, Norway, Denmark, Sweden and Iceland are parties to the region. Of the Arctic states within this region it is therefore only Russia which is not a party to the OSPAR Convention.

Functional scope

The Convention includes general obligations for the states and also obligations for the Commission to adopt strategies and elaborate the Convention. The states are under a general obligation to "prevent and eliminate pollution and to take the "necessary measures to protect the maritime area against the adverse effects of human activities".[205] The Convention covers all sources of marine pollution. It has also a broader scope than pollution includes all human activities with the exception of fishing and shipping.[206] The general obligation is elaborated and specified through the obligations in Articles 3 to 7 and through the Annexes. Annex I-V cover issues such as dumping, pollution from land based sources, pollution from off shore sources, assessment of the quality of the marine environment and protection and conservation of the ecosystems and the biological diversity.

Reporting/enforcement mechanisms

The OSPAR Convention includes mechanisms for reporting the implementation of the Convention. The Contracting Parties shall report at

[203] www.ospar.org
[204] Molenaar and Koivurova, International Governance and Regulation of the Marine Arctic, Overview and Gap Analysis, p. 15.
[205] The OSPAR Convention Article 2.
[206] The OSPAR Convention, Preamble.

regular intervals to the OSPAR Commission who shall assess their compliance with the Convention.[207]

4.2.3 Memorandum of Understanding (MoU) between NEAFC and OSPAR Commission (1998)[208]

NEAFC and OSPAR have complementary competences for fisheries management and environmental protection in the North-East Atlantic, including areas beyond national jurisdiction.

Objective

The objective of the MoU is to promote mutual cooperation towards the conservation and sustainable use of marine biological diversity including protection of marine ecosystems in the North-East Atlantic.

Geographical scope

The geographical scope of the MoU is the regulatory are of NEAFC and OSPAR.[209]

Functional scope

NEAFC and OSPAR have through the MoU agreed upon several measures to achieve the objective, e.g. to ensure that there is a free flow of mutually useful information between the two organizations, to discuss jointly their respective concerns over the management of human activities that impact on the marine environment, to develop a common understanding of the application of the precautionary approach/principle and to encourage the funding and conduct of marine science.

4.2.4 Convention on the Protection of the Marine Environment of the Baltic Sea

The Convention on the Protection of the Marine Environment of the Baltic Sea (the Helsinki Convention) was adopted in 1992 and entered into force 17 January 2000.[210]

Objectives

The objectives of the Helsinki Convention are to take all appropriate measures to prevent and eliminate pollution in order to promote the ecological restoration of the Baltic Sea area and the preservation of its ecological balance.

Geographical Scope

The Convention is regional. The geographic area of the Convention is described in Article 1. The Convention covers the Baltic Sea and the entrance to the Baltic Sea bounded by the parallel of the Skaw in the

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[207] The OSPAR Convention Articles 22 and 23.
[208] http://www.ospar.org/html_documents/ospar/html/mou_neafc_ospar.pdf
[209] http://neafc.org/page/27, http://www.ospar.org/content/regions.asp?menu=00020200000000_000000_000000
[210] http://www.helcom.fi/Convention/en_GB/text/

Skagerrak. Of the Arctic states, Denmark, Finland, Sweden and Russia are parties to the Convention.[211]

Functional Scope
The Convention contains fundamental principles and obligations.[212] States shall apply the precautionary principle, promote the use of best environmental practice (BEP) and best available technology and apply the polluter-pays principle. The Convention also includes obligations to prevent and eliminate pollution caused by harmful substances and to prevent and eliminate pollution from land based sources. The Convention addresses the use of environmental impact assessments for activities that are likely to cause significant adverse impacts on the marine environment. States shall also take measures to avoid pollution from shipping and prohibit dumping in the Baltic Sea. The Parties shall furthermore take measures to protect the marine environment from exploration or exploitation of the seabed and its subsoil. Additionally the Convention includes provisions on notification of pollution incidents, cooperation in combating marine pollution and on nature conservation and biodiversity.

Reporting/enforcement mechanisms
The Convention includes regulations for reporting to the Commission on the implementation of the provisions of the Convention.

4.2.5 Agreement on the Conservation of Polar Bears (1973)[213]
The agreement commits the signatories to manage polar bear populations in accordance with sound conservation practices; prohibits hunting, killing, and capturing bears except for limited purposes and by limited methods, and commits all parties to protect the ecosystems of polar bears.

Members
Canada, Denmark, Norway, Russian Federation and the United States.

Geographical scope
The Agreement applies to the five parties to the Agreement, which are the five polar bear range states.

Functional scope
The Agreement regulates the taking of polar bears and provides for a broad prohibition on the taking of polar bears, subject to a number of specific exceptions, including, for example, takings for scientific or conservation purposes and by local people using traditional methods in the exercise of their traditional rights.

4.3 Fisheries
4.3.1 Convention on the Conservation and Management of Pollock

[211] http://www.helcom.fi/helcom/cp/en_GB/contractingparties/

[212] The Baltic Convention Article 3.
[213] http://sedac.ciesin.org/entri/texts/polar.bears.1973.html

Resources in the Central Bering Sea ("Donut Hole Agreement"), 1994
Members
The People's Republic of China, Japan, the Republic of Korea, Poland, the Russian Federation, and the United States.

Objectives
1. to establish an international regime for conservation, management, and optimum utilization of pollock resources in the Convention Area [the high seas area of the Bering Sea beyond the U.S. and Russian 200- mile jurisdictions];
2. to restore and maintain pollock resources in the Bering Sea at levels which will permit their maximum sustainable yield;
3. to cooperate in the gathering and examining of factual information concerning pollock and other living marine resources in the Bering Sea; and
4. to provide, if the Parties agree, a forum in which to consider the establishment of necessary conservation and management measures for other living marine resources in the Convention Area as may be required in the future.

Functional scope
The Convention establishes long-term measures for the conservation, management, and optimum utilization of the Aleutian Basin Pollock stock in the Central Bering Sea. The stock experienced a drastic decline prior to the negotiation of this agreement, and remains at a low level of abundance. There is currently a voluntary moratorium on fishing for pollock in the "Donut Hole," although fishing may resume under the Convention when stocks reach a sustainable abundance level. The Convention requires that vessels fishing for pollock in the "Donut Hole" use real-time satellite position-fixing transmitters and carry observers on board. It also requires that any vessels fishing in the area consent to boarding and inspection for compliance with the Convention by enforcement officials of the member states. The agreement will aid in ensuring the long-term health of pollock stocks in the Central Bering Sea on which the U.S. pollock industry in the Pacific Northwest in part depends.

4.3.2 Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean (Basic Instrument for the North Pacific Anadromous Fish Commission – NPAFC) (1992)
Members
Canada, Japan, the Republic of Korea, the Russian Federation, and the United States.

Objective
The NPAFC serves as a forum for promoting the conservation of anadromous stocks and ecologically-related species, including marine mammals, sea birds, and non-anadromous fish, in the high seas area of the North Pacific Ocean. This area, as defined in the Convention, is "the waters of the North Pacific Ocean and its adjacent seas, north of 33E North Latitude beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured." In addition, the NPAFC serves as

the venue for coordinating the collection, exchange, and analysis of scientific data regarding the above species within Convention waters. It also coordinates high seas fishery enforcement activities by member countries (the Convention prohibits directed fishing for salmonids and includes provisions to minimize the incidental take of salmonids in other fisheries in the Convention area).

(In addition, it should be mentioned that the WCPF Convention (on Pacific highly migratory fish stocks) has an undefined management area to the north and could be applicable to the Arctic marine area.)

4.3.3 Convention on Future Multilateral Co-operation in North-East Atlantic Fisheries[214] *(NEAFC Convention)*
Entry into force: 17 March, 1982

Member States
Denmark (in respect of the Faroe Islands and Greenland), EU, Iceland, Norway and Russian Federation.

Cooperating Non-Contracting Parties
Belize, Cook Islands, Canada, Japan and New Zealand.

Objective
The objective is to ensure the long-term conservation and optimum utilisation of the fishery resources in the Convention Area, providing sustainable economic, environmental and social benefits.

Geographical scope
The Convention Area is defined as those parts of the Atlantic and Arctic Oceans and their dependent seas which lie north of 36° north latitude and between 42° west longitude and 51° east longitude. (Certain areas are excluded.) NEAFCs regulations apply at the high seas, in its Regulatory Area, which include the high seas areas of a part of the Arctic Ocean (the Atlantic wedge), the Barents Sea Loopholde, the Norwegian Sea Banana Hole, and the high seas area in the southern North East Atlantic Ocean.

Functional scope
NEAFC have competence to make recommendations concerning fisheries conducted beyond the areas under jurisdiction of the Contracting Parties. Such recommendations shall be adopted by a qualified majority. NEAFC shall apply specified principles when making use of its competence, e.g. the precautionary approach and ecosystem-based management.

NEAFC may, by a qualified majority, make recommendations concerning measures of control relating to fisheries conducted beyond areas under the jurisdiction of the Contracting Parties for the purpose of ensuring the application of the convention and any recommendations adopted thereunder.

[214] http://neafc.org/basictexts

In xxxx NEAFC adopted the Scheme of Control and Enforcement. Unless otherwise stated, the Scheme shall apply to all vessels used or intended for use for fishing activities conducted on fisheries resources in the Regulatory Area. The scheme is comprehensive. The parties establish a system of "NEAFC inspectors", after which the parties are qualified to inspect each others (flagged) vessels on the high seas. Further the Scheme set out procedures for port state control of foreign fishing vessels.

4.3.4 1979 Conventionon on Future Multilateral Cooperation in the Northwest Atlantic Fisheries (NAFO Convention)[215]
Entry into force: 1 January 1979.
Member States
Canada, Cuba, Denmark (in respect of the Faroe Islands and Greenland), EU, France (in respect of Saint Pierre et Miquelon),
Iceland, Japan, Republic of Korea, Norway, Russian Federation, Ukraine and United States of America.

Objective
The objective is to establish and maintain an international organization whose object shall be to contribute through consultation and cooperation to the optimum utilization, rational management and conservation of the fishery resources of the Convention Area. This organization shall be known as the Northwest Atlantic Fisheries Organization and shall carry out the functions set forth in the Convention.

Geographical scope
The waters of the Northwest Atlantic Ocean north of 35°00' north latitude and west of a line extending due north from 35°00' north latitude and 42°00' west longitude to 59°00' north latitude, thence due west to 44°00' west longitude, and thence due north to the coast of Greenland, and the waters of the Gulf of St. Lawrence, Davis Strait and Baffin Bay south of 78°10' north latitude.

(The scope of NAFO appears from a map on NAFO´s website.[216] The map shows the northwestern parts of the Atlantic Ocean west of Greenland, north of North Carolina in USA and north in the direction of the strait between Canada and Greenland.)

Functional scope
NAFO consist of General Council, Scientific Council, Secretariat and Fisheries Commission. The General Council and the Fisheries Commission have power to adopt binding resolutions. The Fisheries Commission is responsible for the management and conservation of the fishery resources of the Regulatory Area. The Commission may adopt proposals for joint action by the Contracting Parties, designed to achieve the optimum utilization of the fishery resources. In the exercise of these functions the

[215] http://www.nafo.int/about/frames/about.html

Fisheries Commission shall seek to ensure consistency between proposals and measures for stocks occurring both within the Regulatory Area and in areas under the fisheries jurisdiction of a Coastal State. The Fisheries Commission may adopt proposals for international measures of control and enforcement. In that respect the Fisheries Commission has adopted:

NAFO Conservation and Enforcement Measures.[217]
Unless otherwise provided, the measures shall apply to all fishing vessels used or intended for use for the purposes of commercial fishing activities conducted on fisheries resources in the Regulatory Area.

The scheme is comprehensive. The parties establish a system of joint inspection and surveillance, after which the parties are qualified to inspect each others (flagged) vessels on the high seas. Further the scheme set out procedures for port state control of foreign fishing vessels.

4.3.5 Agreement on Cooperation in Research, Conservation and Management of Marine Mammals in the North Atlantic (NAMMCO Agreement)[218]
Entry into force: 8 July 1992

Member States
Norway, Iceland, Greenland and the Faroe Islands.

Objective
The objective is conservation, rational management and study of marine mammals in the North Atlantic.

Geographical scope
The geographical scope of NAMMCO is the North Atlantic. The NAMMCO Agreement doesn’t define the scope any further.

Functional scope
NAMMCO consists of several bodies: The Council, the Secretariat, the Management Committees (for cetaceans and seals and walruses), the Scientific Committee, the Committee on Finance and Administration, the Committee on Hunting Methods and the Committee on Inspection and Observation. NAMMCO is complementary to IWC by focusing on smaller whales than IWC and on marine mammals that IWC does not cover.

4.3.6 Convention for the Conservation of Salmon in the North Atlantic Ocean, 1982;
Objective
The purpose of the North Atlantic Salmon Conservation Organization is: to promote the acquisition, analysis, and dissemination of scientific information pertaining to salmon stocks in the North Atlantic Ocean, and to promote the

[217] http://www.nafo.int/publications/frames/fisheries.html
[218] http://www.nammco.no/Nammco/Mainpage/DocumentsAndInformation/nammco_agreement.html

conservation, restoration, enhancement, and rational management of salmon stocks in the North Atlantic Ocean through international cooperation.

Geographical scope
The Convention applies to the salmon stocks which migrate beyond areas of fisheries jurisdiction of coastal states of the Atlantic Ocean north of 36° N latitude throughout their migratory range.

Member States
Members include Canada, Denmark, the European Union, Finland, Iceland, Norway, Sweden, the United States and the Russian Federation.

(It should also be mentioned that ICCAT (Atlantic tuna) has an undefined border northwards that in principle could stretch to the North Pole.)

4.3.7 Other regional fisheries arrangements
In addition to those listed above, there are a number of other regional fisheries arrangements of a more limited nature. Examples include the coastal state agreement on the manangement of Atlanto-Scandic herring, which addresses the fisheries of herring in areas under national jurisdiciton. This has to be read in relation to NEAFC management of the high seas portion of this stock.[219]

There are also an established North Atlantic Fisheries Ministers´ Conference, and a Nordic cooperation at ministerial level.

4.4 Science

4.4.1 Convention for a North Pacific Marine Science Organization (PICES), 1992
Members
Canada, Japan, People's Republic of China, Republic of Korea, Russian Federation, and the United States of America.

Objective
PICES was established to promote and coordinate marine scientific research in the northern North Pacific and adjacent seas. The organization's purpose is to advance scientific knowledge about the ocean environment, global climate change, living resources and their ecosystems, and the impacts of human activities, and to promote the collection and rapid exchange of scientific information on these issues.

Geographical scope
The PICES area is the temperate and sub-Arctic region of the North Pacific Ocean and its adjacent seas, especially northward from 30E North Latitude.

Functional scope
PICES is comprised of a Governing Council, a Science Board, such

[219] Source

permanent or ad hoc scientific groups and committees as the Governing Council from time to time may establish and a Secretariat. PICES has carried out several research projects, among others; Marine Ecosystem Model Inter-Comparison Project (in progress), Bering Sea Indicators and North Pacific Ecosystem Status Report.

4.4.2 Convention for the International Council for the Exploration of the Sea (ICES)[220]

The environment of the North Atlantic and adjacent seas has been the prime concern of ICES since its inception in 1902. As the oldest intergovernmental marine science organization in the world, its main focus has continued to be on international cooperative scientific studies.

Objective

Article 1 of the 1964 ICES Convention formally identifies the Council's principal functions:

a. to promote and encourage research and investigations for the study of the sea particularly related to the living resources thereof;

b. to draw up programs required for this purpose and to organize, in agreement with the contracting parties, such research and investigations as may appear necessary;

c. to publish and otherwise disseminate the results of research and investigations carried out under its auspices.

Since the 1970s, a major responsibility for ICES has involved the provision of scientific information and advice for fisheries conservation and protection of the marine environment to intergovernmental regulatory commissions, the European Commission, and the governments of ICES member countries. ICES works in the broad areas of fisheries, oceanography, and environmental sciences, including the study of marine pollution, and maintains extensive databases on the North Atlantic, in cooperation with other international organizations.

Members

ICES has 20 member countries: Belgium, Canada, Denmark (including Greenland and Faroe Islands), Estonia, Finland, France, Germany, Iceland, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Russia, Spain, Sweden, the United Kingdom, and the United States of America. There are also a number of countries that have affiliate status with ICES. The Affiliate Countries are: Australia, Chile, Greece, New Zealand, Peru, and South Africa.

More than 40 international organizations have Observer status and cooperative relations with ICES. Of the United Nations agencies, ICES works with the Fisheries Department of the Food and Agriculture Organization (FAO), the Intergovernmental Oceanographic Commission, the International Maritime Organization, the World Meteorological Organization, and the UNEP.

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[220] http://www.ices.dk/aboutus/convention.asp

Functions
ICES is a leading forum for the promotion, coordination, and dissemination of research on the physical, chemical, and biological systems in the North Atlantic and adjacent seas such as the Baltic Sea and North Sea, and advice on human impacts on its environment, in particular fisheries effects in the Northeast Atlantic. ICES has long recognized the mutual interdependence of the living marine resources and their physical and chemical environment. In support of these activities, ICES facilitates data and information exchange through publications and meetings, in addition to functioning as a marine data center for oceanographic, environmental, and fisheries data. ICES works with experts from its 20 member Countries and collaborates with more than 40 international organizations, some of which hold scientific Observer status.
Uniquely, ICES is also the provider of objective, independent and apolitical scientific advice on fisheries and environmental management, not only to the governments of its member countries but also to six intergovernmental regulatory commissions.

ICES is a complex organization involving about 1600 scientists. It fulfills functions through an Annual Science Conference, about a dozen committees, over 100 working and study groups, several symposia annually, and a wide range of quality science publications which are recognized as such by the world's scientific community.

4.4.3 The International Arctic Science Committee (IASC)[221] and the International Arcic Social Sciences Association (IASSA)
IASC was established in 1990, began operations in 1991 and today comprises 19 member countries. The IASC member organisations are national science organisations covering all fields of Arctic research. Each national member organisation has a mechanism to provide ongoing contact between its IASC council member and its Arctic science community.

IASC´s mission is to encourage, facilitate and promote leading-edge multi-disciplinary research to foster a greater scientific understanding of the arctic region and its role in the Earth system.
IASC is not a funding agency, but assists with science development by providing scientific advice and also seed money. In general, IASC supported activities are international, Circumarctic and of interest to several IASC member countries. The IASC instruments to support science development include:

Assessments/Science Planning Activities, as for example the Arctic Climate Impact Assessment; Long-term programs, initiated under the umbrella of IASC; Workshops; other instruments, e.g. Projects or Networks; and Early Career Scientist Support

IASC draws on this structure to identify scientific priorities, members of

[221] http://web.arcticportal.org/iasc/

working groups, etc. An international science programme planned or recommended by IASC should be of high priority to Arctic or global science.

There are 19 Member countries, including all the Arctic eight.

The overarching purpose of the International Arctic Social Sciences Association (IASSA)[222] is to promote and stimulate international cooperation and to increase the participation of social scientists in national and international Arctic research. Membership is on a personal basis.

The International Polar Year (IPY)[223]
The International Polar Year is a major scientific programme on the Arctic and the Antarctic, running from 2007 to 2009. The IPY was organized through the International Council for Science (ICSU) and the World Meteorological Organization (WMO) involved over 200 projects, with thousands of scientists from over 60 nations examining a wide range of physical, biological and social research topics.

4.5 General cooperation

4.5.1 The Ottawa Declaration (The Arctic Council)[224]

In 1989, on the initiative of Finland, officials from the eight Arctic countries met to discuss cooperative measures to protect the Arctic environment. The process led to the adoption of the Arctic Environmental Protection Strategy[225] in 1991. On the basis of this, and the desire to also include sustainable development, the idea of an Arctic Council emerged.

The Ottawa Declaration of 1996[226] established the Arctic Council as a high level intergovernmental forum to promote cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic Indigenous communities and other Arctic inhabitants on common Arctic issues, in particular issues of sustainable development and environmental protection in the Arctic.

The member States of the Arctic Council are Canada, Denmark (including Greenland and the Faroe Islands), Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States of America.

In addition to the Member States, the Arctic Council has Permanent Participants, a special category that includes Arctic organizations of Indigenous peoples with a majority of Arctic Indigenous constituency representing a single Indigenous people resident in more than one Arctic

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[222] http://www.iassa.org/
[223] http://www.ipy.org/
[224] The material in this section is mostly from the Web site of the Arctic Council: http://arctic-council.org/
[225] http://arctic-council.org/filearchive/artic_environment.pdf
[226] http://arctic-council.org/filearchive/Declaration%20on%20the%20Establishment%20of%20the%20Arctic%20Council-1..pdf

State; or more than one Arctic Indigenous people resident in a single Arctic State. The category of Permanent Participation is created to provide for active participation of, and full consultation with, the Arctic Indigenous representatives within the Arctic Council. This principle applies to all meetings and activities of the Arctic Council.

Observer status in the Arctic Council is open to non-Arctic states, inter-governmental and inter-parliamentary organizations, and non-governmental organizations.

The Working Groups of the Arctic Council and their supporting scientific and technical Expert Groups hold meetings at regular intervals throughout the year, ahead of the meetings of Senior Arctic Officials and Arctic Council Ministers. There are six Working Groups of the Arctic Council:

Arctic Contaminants Action Program (ACAP)
Arctic Monitoring and Assessment Programme (AMAP)
Conservation of Arctic Flora and Fauna (CAFF)
Emergency Prevention, Preparedness and Response (EPPR)
Protection of the Arctic Marine Environment (PAME)
Sustainable Development Working Group (SDWG)

Each Working Group has a specific mandate, and a Chair and Management Board or Steering Committee, and is supported by a Secretariat. Working Group Management Boards are typically comprised of representatives of national governmental agencies of the Arctic Council Member States, connected to the mandates of the Working Groups; and representatives of the Permanent Participants. The Working Groups execute the programs and projects mandated by the Arctic Council Ministers. These mandates are stated in the Ministerial Declarations that result from Ministerial Meetings. All decisions of the Arctic Council and its subsidiary bodies are by consensus of the eight Member States.

The Arctic Contaminants Action Program[227]

The Arctic Contaminants Action Program (ACAP) is one of the six Working Groups of the Arctic Council. It was given working group status at the Arctic Council Ministerial Meeting in 2006. Prior to that, ACAP had operated as a steering committee called the Arctic Council Action Plan to Eliminate Pollution in the Arctic with a mandate to increase efforts to limit and reduce emissions of pollutants into the environment and promote international cooperation.

The goal of ACAP continues to be to reduce emissions of pollutants into the environment in order to reduce the identified pollution risks. ACAP also

[227] http://arctic-council.org/working_group/acap

encourages national actions for Arctic State governments to take remedial and preventive actions relating to contaminants and other releases of pollutants. ACAP acts as a strengthening and supporting mechanism to encourage national actions to reduce emissions and other releases of pollutants.

The Arctic Monitoring and Assessment Program[228]
The current objective of AMAP is "providing reliable and sufficient information on the status of, and threats to, the Arctic environment, and providing scientific advice on actions to be taken in order to support Arctic governments in their efforts to take remedial and preventive actions relating to contaminants". AMAP is responsible for measuring the levels, and assessing the effects of anthropogenic pollutants in all compartments of the Arctic environment, including humans; documenting trends of pollution; documenting sources and pathways of pollutants; examining the impact of pollution on Arctic flora and fauna, especially those used by indigenous people; reporting on the state of the Arctic environment; and giving advice to Ministers on priority actions needed to improve the Arctic condition. AMAP has produced a series of high quality scientifically-based assessments of the pollution status of the Arctic. The AMAP assessment reports (both the popular readable versions and detailed scientific background documents) are available on the AMAP website.

Conservation of Arctic Flora and Fauna[229]
CAFF's mandate is to address the conservation of Arctic biodiversity, and communicate the findings to the governments and residents of the Arctic, helping to promote practices which ensure sustainability of the Arctic's living resources.With the CAFF 2006-2008 Work Plan, CAFF is responding to the recommendations in the Arctic Climate Impact Assessment calling for long-term data series on status and trends of Arctic biodiversity and the need for further research, observations monitoring and modeling. It is possible to successfully conserve the natural environment and allow for economic development, but this requires solid baseline data on long-term status and trends of Arctic biodiversity, habitats and ecosystem health. CAFF's projects for the upcoming inter-ministerial period will provide data for informed decision making in resolving conflicts which are now arising in trying to both conserve the natural environment and permit regional growth.

Emergency Preparedness, Prevention and Response[230]
The mandate of the EPPR Working Group is to deal with the prevention, preparedness and response to environmental emergencies in the Arctic. Members of the Working Group exchange information on best practices and

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[228] http://arctic-council.org/working_group/amap
[229] http://arctic-council.org/working_group/caff
[230] http://arctic-council.org/working_group/eppr

conducts projects (e.g. development of guidance and risk assessment methodologies, response exercises, training etc.). EPPR is not a response agency. The work has focused mainly on oil and gas transportation and extraction, and on radiological and other hazards. In 2004, EPPR was directed by the Arctic Ministers to expand its mandate to include natural disasters.

Protection of the Arctic Marine Environment[231]
PAME´s Working Group activities are directed towards protection of the Arctic marine environment. Increased economic activity and significant changes due to climatic processes are resulting in increased use, opportunities and threats to the Arctic marine and coastal environments. These predicted changes require more integrated approaches to address both existing and emerging challenges of the Arctic marine and coastal environments. PAME's mandate is to address policy and non-emergency pollution prevention and control measures related to the protection of the Arctic marine environment from both land and sea-based activities. These include coordinated action programmes and guidelines complementing existing legal arrangements. PAME's objectives for 2006-2008 were developed according to its mandate and agreed priorities, and are in line with the goals and objectives as outlined in the Arctic Marine Strategic Plan.

Sustainable Development Working Group[232]
The Working Group on Sustainable Development (SDWG) was established by the Arctic Ministers at the first Arctic Council Ministerial meeting in 1998. The objective of the SDWG is to protect and enhance the economies, culture and health of the inhabitants of the Arctic, in an environmentally sustainable manner. Currently the Sustainable Development Working Group is involved in projects in the areas of children and youth, health, telemedicine, resource management, cultural and ecological tourism, and living conditions in the Arctic.

Important products of the Arctic Council
The direction of the work of the Arctic Council is given by the ministerial declarations adopted every second year, at the end of a chairmanship. The declarations contain broad instructions for the development of the work programs of the working groups.

The most important products of the Arctic Council to date are the various assessments that has been performed, for the Arctic Environment (1998), the Arctic Climate Impact Assessment (2004), the Arctic Human Development Report (2004), the Oil and Gas Assessment (2008), and the Arctic Marine Shipping Assessment (2009).

[231] http://arctic-council.org/working_group/pame
[232] http://arctic-council.org/working_group/sdwg

In addition to the assessments, which are major undertakings, the working groups at any one time run a large number of projects. These may result in strategic initiatives, as for example the Arctic Marine Strategic plan (see below), or project reports on issues of concern, as for example ecosystem-based oceans management. The Arctic Council may also act on recommendations from projects and assessment to develop guidelines or best practices. This has happened in a few instances, for example with regard to offshore petroleum development.[233]

The Arctic Marine Strategic Plan
The 3rd Ministerial Meeting of the Arctic Council in recognized that ".... *existing and emerging activities in the Arctic warrant a more coordinated and integrated strategic approach to address the challenges of the Arctic coastal and marine environment..." and agreed "... to develop a strategic plan for the protection of the Arctic marine environment under leadership by PAME*."

An Arctic Marine Strategic Plan (AMSP) was endorsed by Arctic Council Ministers in 2004. The Arctic Council's vision for the Arctic marine environment is: a *healthy and productive Arctic Ocean and coasts that support environmental, economic and sociocultural values for current and future generations.* The goals of this Strategic Plan are as follows:

- Reduce and prevent pollution in the Arctic marine environment
- Conserve Arctic marine biodiversity and ecosystem functions
- Promote the health and prosperity of all Arctic inhabitants
- Advance sustainable Arctic marine resource use

29 strategic actions in the AMSP were selected according to its goals, principles and approaches, taking into consideration the current and emerging situation affecting the Arctic marine environment, its ecological integrity and the social, cultural, economic and physical well-being of its peoples.

4.5.2 The Ilulissat Declaration (2008)[234]
In 2008, representatives of the five coastal States bordering on the Arctic Ocean met to discuss issues related to the Arctic Ocean. The representatives adopted the Ilulissat Declaration, in which the five Arctic Ocean coastal states emphasize the extensive international legal framework that applies to the Arctic Ocean, note specifically that the law of the sea provides for important rights and obligations in this area, and reaffirm their commitment to this legal framework. The Declaration also provides that the Arctic Ocean coastal States intend to "take steps in accordance with

[233] http://arctic-council.org/filearchive/Arctic%20Offhsore%20Oil%20and%20Gas%20Guidelines%202009.pdf
[234] http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf

international law both nationally and in cooperation among the five states and other interested parties to ensure the protection and preservation of the fragile marine environment of the Arctic Ocean."

Adopted by
Canada, Denmark, Norway, Russian Federation and the United States.

4.5.3 The Svalbard Treaty
Entry into force: 14 August 1925
About 50 states are parties.
Arctic State Parties: Canada**,** Denmark, Finland, Iceland, Norway, Russian Federation, Sweden and the United States.

Objective
In the Svalbard Treaty, the parties desired to recognize the sovereignty of Norway over Svalbard and establish an equitable regime to assure its development and peaceful utilisation.

Geographic scope
Article 1 of the Treaty defines its geographical scope as applying to the Archipelago of Spitsbergen, which comprises, with Bear Island or Beeren-Eiland, all the islands situated between.

Functions
Parties to the Svalbard Treaty recognize the full and absolute sovereignty of Norway over Svalbard, subject to the stipulations elaborated in the Treaty. The Treaty addresses a number of issues, including, for example, access, hunting and fishing, mining, and military use of the territories.

4.5.4 The Barents Region Cooperation
The Barents Region cooperation was established by the Kirkenes Declaration[235] in 1993 as a mechanism to promote cooperation between Russia and the other countries in the region, thereby providing the foundation for stability and sustainable development of the region.

Membership and geographical scope
The Declaration establishes two institutions, the Barents Euro-Arctic Council and the Regional Council. In the first Denmark, Finland, Iceland, Norway, Russia, Sweden and the European Commission are the members, while the latter has the counties and oblasts in the region as members. The current membership in the regional council consists of Finland: Kainuu, Lapland and Oulu Region (North Karelia - was approved observerstatus in 2008); Norway: Finnmark, Nordland and Troms; Russia: Arkhangelsk, Karelia, Komi, Murmansk and Nenets; and Sweden: Norrbotten and Västerbotten.

The cooperation is largely centered on the land areas and covers an area 1,755 million km2 – three times as large as France.

[235] http://www.barentsinfo.fi/beac/docs/459_doc_KirkenesDeclaration.pdf

Functional scope
The functions of the Barents cooperation are demonstrated through the missions of its working groups. It currently has six working groups at the Council level, four working groups at the Regional Council level, and five joint working groups. In addition there is a working group of indigenous people.

Barents Euro-Arctic Council working groups
- Economic cooperation
- Customs cooperation
- Environment
- Youth
- Transportation
- Rescue cooperation

Joint Barents Euro-Arctic Council – Barents Regional Council working groups
- Health and related social issues
- Education and research
- Energy
- Culture
- Tourism

Barents Regional Council working groups
- Environment
- Communications
- Youth
- Investment and economic cooperation

Indigenous People

A number of agreements and programs have resulted from the cooperation, for example the 2008 between the Governments in the Barents Euro-Arctic Region on Cooperation within the Field of Emergency Prevention, Preparedness and Response.

4.6 Other

4.6.1 UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention)[236]
Adopted 25 February 1991 and entered into force 10 September 1997. There are 45 Parties to the Convention.[237]

Objectives
The objective of the Espoo Convention is not explicitly specified in the Convention. It is however, expressed in the Preamble that the states are determined to enhance international co-operation in assessing

[236] http://www.unece.org/env/eia/
[237] http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4&chapter=27&lang=en

environmental impact in particular in a transboundary context. The States are also affirming the need to ensure environmentally sound and sustainable development.[238] The major mechanism for achieving these objectives is that states must establish a national system for environmental impact assessments (EIA) that enables collaboration with potentially affected states.

Geographical Scope:
The geographical scope of the Espoo Convention is the UNECE- region, which covers Europe and parts of North America and Central and Western Asia. The Convention was signed by all Arctic states, but has been ratified only by Canada, Denmark (with the territorial reservation for the Faroe Islands and Greenland), Finland, Norway and Sweden.

Functional Scope:
The Convention sets out an obligation to assess the environmental impacts at an early stage of planning and before decisions are made.[239] Parties are required to take all appropriate and effective measures to prevent, reduce and control significant adverse transboundary environmental impact from proposed activities.[240] Parties to the Convention must have a system for EIAs and have to carry out an EIA before the decision is taken to authorize or undertake proposed activities listed in Appendix 1. These are mostly land-based, with a few exceptions, such as oil and gas pipelines, "trading ports, offshore hydrocarbon production" and storage facilities for petroleum, petrochemical and chemical products". Affected States shall be notified of a proposed activity listed in Appendix I that is likely to cause a significant adverse transboundary impact.[241] The Parties are required to establish an EIA procedure that permits public participation and preparation of EIA documentation as described in Appendix II.

The Parties to the Convention adopted 21 May 2003 a Protocol on Strategic Environmental Assessments (SEA) which entered into force 11 July 2010.[242] Of the Arctic states, Norway, Finland and Sweden have signed and ratified and therefore legally bound by it, whereas Denmark has signed the Protocol.[243] The protocol requires that SEAs should be carried out for plans and programmes which set the framework for future development consent of projects listed in Annex 1 and Annex 2 to the Protocol. .

Reporting/enforcement measures

[238] The Espoo Convention, Preamble.
[239] http://www.unece.org/env/eia/eia.htm
[240] The Espoo Convention Article 2 .
[241] The Espoo Convention Article 2.
[242] http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4-b&chapter=27&lang=en.
[243] http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-4-b&chapter=27&lang=en

Meeting of the Parties shall be held, where the Parties of the Convention shall keep under continuous review the implementation of the Convention.[244]

4.6.2 *Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention)*

The Aarhus Convention[245] was adopted 25 June 1998 in Aarhus and entered into force 30 October 2001.[246]

Geographical Scope

The Convention has a regional scope. It covers the UNECE region. Four Arctic States are Parties to the Convention: Denmark with a territorial exclusion of the Faroe Islands and Greenland, Finland, Norway and Sweden.[247]

Objective

It follows from Article 1 that the objective of the Convention is to guarantee the rights of access to information, public participation in decision-making, and access to justice in environmental matters to contribute to the protection of the rights of every person of present and future generations to live in an environment adequate to his of her health and well-being.

Functional Scope

The Convention links environmental law and human rights law. The Convention has a rights based approach and focuses on three issues; information, public participation and access to justice.[248] With the increasing activities taking place in the Arctic region such as oil drilling, shipping, mining etc. information, public participation and access to justice is of significance for the protection of the Arctic marine environment and ecosystems and for indigenous communities.[249] The Convention sets forth the right of the public to seek information and the obligation of the authorities to make environmental information available.[250] The provision applies however only to information held by the authorities. According to Article 6 the public concerned have participatory rights in decisions on specific activities. These activities are listed in Annex 1 to the Convention.[251]Article 7 concerns the public participation in the development

244 The tasks of the Parties in ensuring compliance with the Convention is listed in Article 11.

245 United Nations, *Treaty Series* , vol. 2161, p. 447.

246The text of the Convention and information is available at http://www.unece.org/env/pp/welcome.html.

247 http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-13&chapter=27&lang=en.

248 See www.unece.org

249 Overview report: Multilateral Environmental Agreements and their relevance to the Arctic, 2006 p. 26.

250 Aarhus Convention Article 4.

251 A comparison with Annex 2 of the Espoo Convention shows that the activities in Annex 1of the Århus Convention would require some kind of EIA procedures. See Birnie, Boyle and Redgwell, International Law & the Environment, 2009, p. 293.

of plans, programmes and policies relating to the environment, whereas Article 8 concerns the participation during the preparation of regulations and laws that may have a significant effect on the environment. Finally Article 9 includes provisions for the access to justice in three contexts; access to information appeals, public participation appeals and general violations of environmental law.

Reporting/Enforcement mechanisms
The Meeting of the Parties shall keep the under continuous review the implementation of the Convention. The Meeting of the Parties are required to establish on a consensus basis arrangements for reviewing the compliance with the Convention.

4.6.3 Other
In addition, there exists a number of arrangements for cooperation that pertains to the Arctic, including Nordic Cooperation[252] and the EU Northern Dimension.[253]

4.7 Oil and gas

At the regional level the OSPAR Convention is of relevance as the obligations also cover protection of the marine environment from oil and gas activities. The OSPAR Convention and its Decisions and Recommendations are of significance for the oil and gas activities in the North East Atlantic.[254] These regulations are more extensive/specific than the obligations to prevent pollution from sea bed activities provided in LOSC.

Of particular relevance for the Arctic region is furthermore the non legally binding Arctic Offshore Oil and Gas Guidelines which were adopted by the Arctic Environmental Ministers in 1997.[255]

4.8 Integrated oceans management

A number of the instruments and measures reviewed here address Integrated oceans management. At a fundamental level, the Law of the Sea Convention in its preamble states that "…the problems of ocean space are closely interrelated and needs to be considered as a whole." The concept of integrated oceans management relates to the ecosystem approach to oceans management, and the concepts are used interchangeably in the international debate.

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[252] http://www.norden.org/da/samarbejdsomrader/arktis
[253] http://ec.europa.eu/external_relations/north_dim/index_en.htm
[254] Information about the work area of oil and gas within OSPAR is available at http://www.ospar.org/content/content.asp?menu=00210305000000_000000_000000
[255] http://arctic-council.org/filearchive/Arctic%20Offhsore%20Oil%20and%20Gas%20Guidelines%202009.pdf

At a general level, ecosystem-based management has been addressed in the work under the Biodiversity Convention, as well as in other processes, includingunder the UN General Assembly which in its oceans resolution in 2006[256] invited states to consider the agreed consensual elements relating to ecosystem approaches and oceans[257] developed by the Consultative Process earlier that year. The consensual elements include a listing of elements that an ecosystem approach to oceans management should include, as well as requirements to improved application of the approach.[258]

It should also be mentioned that UNFSA expresses the principle of ecosystem-based management, cfr chapter 3 here.[259]

Also at the global level, FAO has developed and formally adopted guidelines for an ecosystem approach to fisheries management.[260]

In the Arctic Council, the Arctic Council Arctic Marine Strategic Plan[261], adopted in 2004, advocates an ecosystem approach to oceans management. Building on this, the “Best Practices in Ecosystems Based Oceans Management Project” addressed what could be regarded as best practices in that regard, based on the experiences of the Arctic countries. A set of “Observed Best Practices for Ecosystems Based Oceans Management in the Arctic”[262] were endorsed by the Arctic Council at the ministerial meeting in Tromsø in April 2009.[263]

Also, a number of other projects under the Arctic Council are relevant to Integrated oceans management. Under the Working Group PAME an ecosystem project [264]addressing Large Marine Ecosystems has been in existence for a long time.

(Text on integrated assessments in here).

4.9 Bilateral and trilateral cooperation

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256 A/RES/61/222, http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N06/507/69/PDF/N0650769.pdf?OpenElement

257 257 A/RES/61/222, para 119.

258 A/61/156 Report of the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting. http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N06/432/90/PDF/N0643290.pdf?OpenElement

259 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA), article 5.e.

260 http://www.fao.org/docrep/009/a0191e/a0191e00.htm

261 http://www.pame.is/arctic-marine-strategic-plan

262 Available at the Web site of the Sustainable Development Working Group: http://portal.sdwg.org/content.php?doc=75

263 Tromsø Ministerial Declaration page 5, accessible at: http://arctic-council.org/filearchive/Tromsoe%20Declaration-1..pdf

264 http://www.pame.is/ecosystem-approach

(Not written yet, awaiting material)

4.10 Conclusions