**Project no. 265863**

# ACCESS

## Arctic Climate Change, Economy and Society

Instrument: Collaborative Project
Thematic Priority: Ocean.2010-1 “Quantification of climate change impacts on economic sectors in the Arctic”

# D5.41 – Summary of Governance Options over the ACCESS time period (ca. 30 years)

Due date of deliverable: **28/02/2015**

Actual submission date: **26/03/2015**

Used Person/months: **13.0**

Start date of project: **March 1st, 2011** Duration: **48 months**

Organisation name of lead contractor for this deliverable: **NERC**

| **Project co-funded by the European Commission within the Seventh Framework Programme (2007-2013)** | | |
|---|---|---|
| **Dissemination Level** | | |
| **PU** | Public | |
| **PP** | Restricted to other programme participants (including the Commission Services) | |
| **RE** | Restricted to a group specified by the consortium (including the Commission Services) | X |
| **CO** | Confidential, only for members of the consortium (including the Commission Services) | |

# CONTENTS

# FIGURES AND TABLES

# EXECUTIVE SUMMARY

The increasingly rapid rate of climate change and its impacts present new challenges to the resilience of life in the Arctic[1]. The responses both in natural systems as well as economic, political and social are hard to predict. Uncertainty pervades. To develop governance[2] systems able to respond effectively to the changes as well as meeting the needs of the stakeholders presents enormous challenges for the Arctic Ocean coastal states as well as the wider international community.

This report describes governance options that could remain viable for the next 30 years in the light of climate change. The governance options discussed range from existing governance arrangements already in place to those proposed by academics and interested parties.

The sectors reviewed are marine transport and tourism, fisheries and aquaculture and oil and gas extraction. In addition environmental governance options are considered. The context within which governance is being developed is described including the current position of the European Union in relation to the Arctic. The impacts of climate change on Arctic Indigenous Peoples are discussed in relation to the development of governance options. The development and use of indicators for effective governance is explored.

**Key findings:**

**General**

High levels of uncertainty are associated with the environmental and social changes underway in the Arctic. To be able to respond within appropriate time scales governance mechanisms must be adaptive and any new instruments or amendments to existing instruments need to be relatively quick to put in place as ponderous and protracted policy making risks being out-of-date before it is implemented. (Section1: Introduction)

The existing range of approaches to environmental governance from formal to informal ad hoc cooperation offer possible responses to rapid changes (Section 4: Environmental Governance)

A single pan-Arctic Treaty, similar to the Antarctic Treaty, now seems unlikely. Our observations suggest that no single approach is emerging but rather a range of approaches

[1] While the focus of the ACCESS project is the effects of climate change it should be remembered that climate change is not the only driver of change in the Arctic. Others include global demand for resources, global finance, economic growth, global population increase, pollution.

[2] The definition of 'governance' given by Olsen *et al*. 2006: "*Governance sets the stage within which management occurs* ... (and) *... encompasses formal and informal arrangements, institutions and mores that structure and influence i) how resources or an environment are utilized; ii) how problems and opportunities are evaluated and analysed; iii) what behaviour is deemed acceptable or forbidden and iv) what rules and sanctions are applied to affect the pattern of use*." This is the definition used within this report and is applied at global, regional, national and local levels.

from formal, legally binding (e.g. the new Polar Code) to ad hoc, local, non-standardised arrangements. (Section 7: Governance Spectrum)

While policy / governance decisions need to be agreed on by most (if not all) parties to ensure compliance this should not result in acceptance of the lowest standards. Ad hoc regional or bilateral agreements may offer a more efficient path to solutions than legislatively cumbersome treaties. (Section 6.4: Gaps and limitations in Arctic Ocean regulatory system)

Treaties may produce weaker commitments than a soft law regime. As soft law agreements are not legally binding, states may be more willing to include substantive commitments and governments may also be more willing to take innovative approaches. A 'soft law' approach, which potentially take less time to develop and is more likely to be adhered to, may be better suited to a rapidly changing environment. (Section 8.1: 'Soft law' or 'hard law' approach?)

Increasing interest and activity in the Arctic from non-Arctic States makes a broader dialogue essential. Arctic Council needs to retain dialogue with non-Arctic States since in particular international law requires this for high seas fisheries and seabed ABNJ. (Section 2.2.1: Role of the Arctic Council)

Transboundary, ecosystem-based approaches to governance are essential. Standardisation / harmonisation of regulations is an ideal – in particular for transboundary resources, living and non-living, as well as other activities. For this to succeed there needs to be a commitment at a national level. Marine spatial planning offers one method through which this can be approached. (Section 6: Climate Change and Governance)

The changing environmental, economic, social and policy landscapes in the Arctic make it essential that governance arrangements are regularly monitored to gauge how changes in governance may affect / are affecting Arctic users / stakeholders /regional bodies / indigenous peoples. (Section 5: Governance Indicators)

**Indigenous peoples**

Processes need to be established or strengthened to ensure meaningful consultation with stakeholders, including indigenous peoples and user groups during development or revision of policy instruments. (Section 3: Indigenous Peoples)

Participation of indigenous peoples in knowledge sharing and decision making processes should in particular be ensured by adequate access to means of communication. (Section 3: Indigenous Peoples)

National and industry interests should not be allowed to take precedence over those of the environment and indigenous and local populations and the policy-making process in the Arctic should incorporate traditional knowledge. (Section 8: Future Governance and Section 3: Indigenous Peoples)

**Main governance gaps to be addressed in the sectors studied by ACCESS:**

### Cross-sectoral

Need development/strengthening of legislation relating to underwater noise in the Arctic. (Section 4.1: Ocean Noise)

### Shipping

Gaps in the mandatory Polar Code need to be addressed: invasive species (ballast water/hull-fouling), noise and air pollution – including black carbon. (Section 6.1.1.2: Existing and developing governance options for Arctic shipping)

There is a need for a mandatory regime to be developed for insurance to cover vessels operating in the Arctic Ocean. Such a regime should ensure that all ships carry adequate levels of insurance which take account of the difficult operating and recovery conditions in the arctic. Such a regime also should ensure that ship owners are not able to evade responsibility. (Section 6.1.1.2: Existing and developing governance options for Arctic shipping)

Regulation of tourist activities in the Arctic, and associated infrastructure, requires urgent action. The existing voluntary guidelines will need to be carefully integrated with the Polar Code and other regulatory developments to maintain a coherent regulatory framework. (Section 6.1.2.2: Existing and developing governance options for Arctic marine tourism)

### Fisheries and aquaculture

Limited understanding of impacts of climate change on aquaculture makes it difficult to develop ecosystem-based legislation. (Section 6.2.2.1: Impacts of climate change on aquaculture in the Arctic)

Aquaculture legislation, operating standards and practices, particularly on hygiene and pathogen transfer, should be coordinated across borders to limit the risk of disease transfer and development. (Section 6.2.2.2: Existing and developing governance options for aquaculture)

### Oil and gas

There is a need to develop of a fund for compensation in the event of pollution from hydrocarbon activities. (Section 6.3.2: Existing and developing governance options for oil and gas activities in the Arctic Ocean)

There is a need to develop legislation relating to damage from oil pollution in the high seas. (Section 6.3.2: Existing and developing governance options for oil and gas activities in the Arctic Ocean)

Regulations relating to Arctic offshore oil and gas activities need to be strengthened and harmonized while taking into account differences in local conditions in terms of type of resource, infrastructure in place, local and indigenous communities. (Section 6.3.2: Existing and developing governance options for oil and gas activities in the Arctic Ocean)

# ACRONYMS

| | |
|---|---|
| ABNJ | Areas Beyond National Jurisdiction |
| ACAP | Arctic Contaminants Action Program |
| ACCESS | Arctic Climate Change, Economy and Society |
| ACIA | Arctic Climate Impact Assessment |
| AECO | Association of Arctic Expedition Cruise Operators |
| AEPS | Arctic Environmental Protection Strategy |
| AGP | Arctic Governance Project |
| AIO | Arctic Inupiat Offshore |
| AMAP | Arctic Monitoring and Assessment Programme |
| AMSA | Arctic Marine Shipping Assessment |
| AMTP | Arctic Marine Tourism Project |
| AOOGG | Arctic Offshore Oil and Gas Guidelines |
| ASTI | Shipborne Tourism Initiative |
| BAT | Best Available Techniques |
| BEAC | Barents Euro-Arctic Council |
| BEP | Best Environmental Practices |
| BBNJ | Biological Diversity Beyond Areas of National Jurisdiction |
| CAFF | Conservation of Arctic Flora and Fauna |
| CBD | Convention on Biological Diversity |
| CCBSP | Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea |
| CLC | International Convention on Civil Liability for Oil Pollution Damage |
| COP | Conference of the Parties |
| CPAR | Conference of Parliamentarians of the Arctic Region |
| EEZ | Exclusive Economic Zone |
| EIA | Environmental Impact Assessment |
| EPPR | Emergency Prevention, Preparedness and Response |
| EU | European Union |
| FAO | Food and Agriculture Organisation |
| FMP | Fishery Management Plan |
| GEF | Global Environment Facility |
| HDI | Human Development Index |
| ICCAT | International Convention for the Conservation of Atlantic Tunas |
| ICES | International Council for the Exploration of the Sea |
| IHDI | Inequality–adjusted Human Development Index |

| | |
|---|---|
| IMO | International Maritime Organisation |
| IPCC | Intergovernmental Panel on Climate Change |
| IOC | Intergovernmental Oceanographic Commission |
| ISA | International Seabed Authority |
| ISO | International Organization for Standardization |
| IUU | Illegal, Unreported and Unregulated Fishing |
| LNG | Liquefied Natural Gas |
| MARPOL | International Convention for the Prevention of Pollution from Ships |
| MPA | Marine Protected Area |
| MoU | Memorandum of Understanding |
| NAFO | Northwest Atlantic Fisheries Organization |
| NAMMCO | North Atlantic Marine Mammal Commission |
| NASCO | North Atlantic Salmon Conservation Organization |
| NEAFC | North East Atlantic Fisheries Commission |
| NCM | Nordic Council of Ministers |
| ND | Northern Dimension |
| NGO | Non-governmental organisation |
| NPAFC | North Pacific Anadromous Fish Commission |
| NPFMC | North Pacific Fishery Management Council |
| NWP | North West Passage |
| NSR | Northern Sea Route |
| OCS | Outer Continental Shelf |
| OCIMF | Oil Companies International Marine Forum |
| OPRC | 1990 Convention on Oil Pollution Preparedness and Response Agreement |
| OSPAR | Convention for the Protection of the Marine Environment of the North-East Atlantic |
| PAME | Protection of the Marine Environment |
| PICES | North Pacific Marine Science Organization |
| PSC | Port State Control |
| P&I | Protection and Indemnity |
| QSR | Quality Status Reports |
| RFMO | Regional Fisheries Management Organisation |
| SAR | Search and Rescue |
| SCPAR | Standing Committee of Parliamentarians of the Arctic Region |
| SDWG | Sustainable Development Working Group |

| | |
|---|---|
| SOLAS | Safety of Life at Sea |
| STCW | Standards of Training, Certification and Watchkeeping |
| TAC | Total Allowable Catch |
| TK | Traditional Knowledge |
| TFOPP | Task Force on Arctic Marine Oil Pollution Prevention |
| TEK | Traditional Ecological Knowledge |
| TWAP | Transboundary Waters Assessment Programme |
| UN | United Nations |
| UNCLOS | United Nations Convention on the Law of the Sea |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNDP | United Nations Development Programme |
| UNFSA | United Nations Fish Stocks Agreement |
| UNGA | United Nations General Assembly |
| US | United States |
| USA | United States of America |
| USGS | United States Geological Survey |
| WCPFC | Western and Central Pacific Fisheries Commission |
| WIPO | World Intellectual Property Organization |
| WTO | World Trade Organisation |
| WWF | World Wide Fund for Nature |

# 1. INTRODUCTION

The increasingly rapid rate of climate change presents new challenges to the resilience of Arctic life (ACIA, 2004). The responses both of natural systems as well as economic, political and social are hard to predict. Uncertainty pervades.
The latest Intergovernmental Panel on Climate Change (IPCC) report attaches 'high confidence' to the statement that "*unique and threatened systems, including ecosystems and cultures, are already at risk from climate change*" (IPCC, 2014). The report continues that, with additional warming of 1°C, the number of systems at risk of severe consequences will increase and additional warming of 2°C will result in very high risks to species and systems with limited capacity to adapt – particularly Arctic sea-ice and coral-reef systems. There is growing evidence that there are additional multiple threats to, and changes occurring in, global marine systems (e.g., pollution, over-exploitation of marine resources, acidification, hypoxia, and sea level rise), and some of these are now reaching into the Arctic. The scientific literature indicates that the effects and interactions among these factors are not yet fully understood (PAME, 2013).

The effects of climate change in the Arctic Ocean with potentially the most relevance in the context of governance are a reduction in sea ice, reduced sea ice thickness, increased sea ice mobility, sea-water temperature rise and extreme weather focusing. Possibly the most significant of these in terms of governance is the retreat of sea ice. While receding sea ice offers increased opportunities for human activities in the Arctic Ocean, with increased activities come increased threats – both to the fragile ecosystems and to the way of life of the local and indigenous populations. These threats are compounded by the changes to the environment brought about by climate change.

The opening up of the Arctic Ocean to increasing human activities is inevitable – and has already begun. Vessel traffic is predicted to increase (AMSA, 2009) and Arctic marine tourism is also likely to increase (Toll and Walsh, 2012).

Various predictions on the future impacts of climate change on commercial fisheries in the Arctic are emerging for some stocks. These include the potential expansion of existing range (ACIA, 2005a; ACCESS D3.11[3]), increased recruitment (ACIA, 2004), movement into new areas (Hollowed *et al*., 2013; Cheung *et al*., 2009). The effects on aquaculture are predicted to be both positive and negative with a likely shift to the north of the optimum temperature zone for this activity (ACCESS report D3.21[4]).

Offshore oil and gas activities currently occur at only a limited number of locations in the Arctic but future development is likely / inevitable. The United States Geological Survey (USGS) has used models to assess the area north of the Arctic Circle and conclude that about 30% of the world's undiscovered gas and 13% of the world's undiscovered oil maybe found there, mostly offshore in water depths of less than 500 metres (Gautier *et al*., 2009). What percentage of these reserves will be ultimately recovered and the economic drivers and challenges cannot be predicted. The *Deep Water Horizon* incident in the Gulf of Mexico in 2010 and the grounding of the *Kulluck* off the coast of Alaska in December 2012 raised serious concerns about the regulation of the offshore hydrocarbon industry in Arctic waters. An understanding of the behaviour and distribution of oil spill products in Arctic conditions is

[3] ACCESS report D3.11: Economic impacts of global warming on fisheries
[4] ACCESS report D3.21: Climate change and Arctic aquaculture

still developing (ACCESS Report D4.42[5]). Concerns about regulation are compounded by uncertainties surrounding impacts of a spill on local communities and fragile ecosystems.

All of the above developments have environmental, social, cultural and economic implications which, in turn, will influence the development of systems of sustainable governance. To develop governance systems able to respond effectively to the changes as well as meeting the needs of the stakeholders presents enormous challenges for the Arctic Ocean coastal states as well as the wider international community.

A major challenge to governance is the need to respond to such changes within appropriate time scales. Governance mechanisms must be adaptive and any new instruments or amendments to existing instruments need to be relatively quick to put in place as ponderous and protracted policy-making risks being out-of-date before it is implemented. However, inherent in this is the danger that, in order to reach agreement quickly, regulatory regimes will be set at the lowest common denominator. This needs to be avoided and only the highest standards should be set. Existing examples of 'best practice' should be identified and applied.

**Section Summary**

- High levels of uncertainty – environmental, social and economic
- Increased human activities – potentially increased economic opportunities but also potential increase in environmental, social and cultural threats
- Impacts on governance
- Governance mechanisms must be adaptive and any new instruments or amendments to existing instruments need to be relatively quick to put in place
- Examples of best practice should be identified and applied

# 2. CONTEXT FOR GOVERNANCE

The purpose of this report is to describe and analyse governance options that could remain viable for the next 30 years in the light of climate change. Earlier ACCESS reports, D5.11[6], D5.21[7] comprised a comprehensive review and analysis of relevant instruments, agreements and guidelines relating to the ACCESS themes of marine transportation and tourism, fisheries and resource extraction. The reports identified a complex mosaic of policies, measures and regulations spanning various levels, institutions and states with varying degrees of maturity. ACCESS report D5.31[8] identified potential stresses on the regulatory system as a result of climate change. A diagram of Arctic-relevant governance instruments (Annex I) and tables of current regulatory instruments relating to marine transport and tourism (Annex II), fisheries (Annex III), oil and gas activities (Annex IV) and environmental governance (Annex V) are appended to this report.

[5] ACCESS report D4.42: Assessment of the behaviour of different types of oil and gas products in a cold water environment

[6] ACCESS report D5.11: Analysis and synthesis of extant and developing regulatory frameworks

[7] ACCESS report D5.21: Current governance options for ACCESS sectors/themes

[8] ACCESS report D5.31: Assessment of inputs regarding climate change effects and impacts on extant regulatory systems and overview and review of predicted stress on these systems

There is no fixed definition of geographic boundaries of "the Arctic" and several definitions exist and are used extensively. These include the area with a July isotherm below 10º C, vegetation distribution (tundra) or political boundaries[9] (Rekacewicz, 2012). The focus of the ACCESS project is the Arctic Ocean (Figure 1).

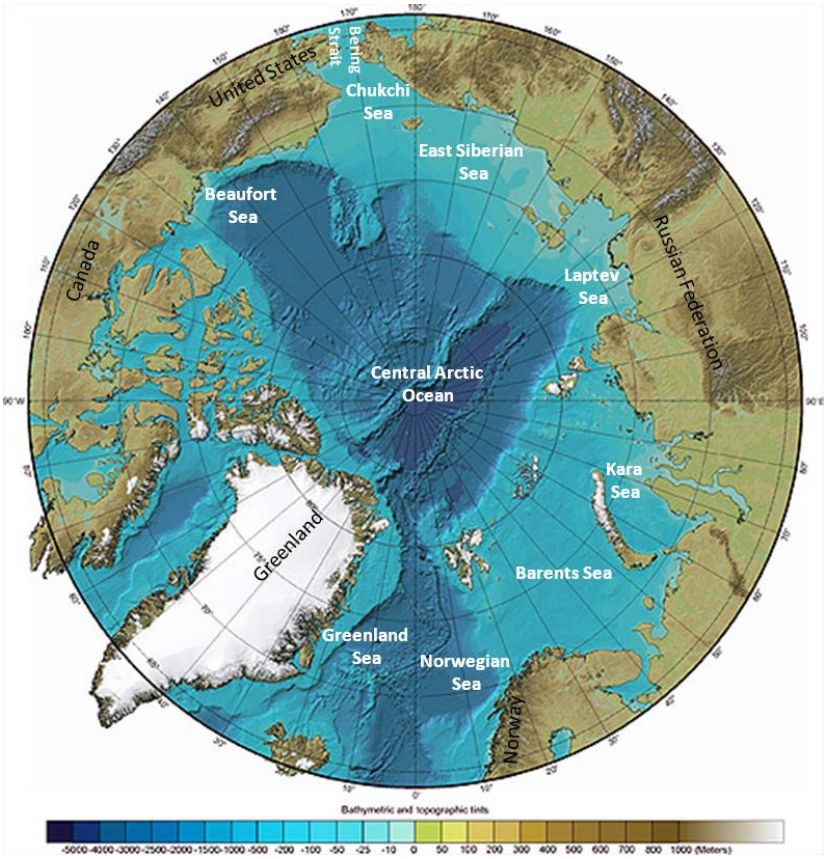



**Figure 1.** Arctic Ocean and associated seas. (Adapted from *Jakobsson et al.*[10] http://www.ngdc.noaa.gov/mgg/bathymetry/arctic/maps/version3_0/Ver3_Map_LetterSize_round.pdf)

The following section, which is an overview of the current governance landscape at January 2015, sets the context in which governance options are developing.

## 2.1. Role of the United Nations

The United Nations Law of the Sea[11] (UNCLOS) provides the legal *framework* for activities in the oceans. The Convention provides signatories with a definition of maritime zones (Figure 2) and a comprehensive set of regulations and governance criteria, to be interpreted and implemented by coastal states. Adjustments and enhancement to the detail of the Convention's regulations can be added, by consensus of the States Parties, through a process of implementing agreements, although this process should not fundamentally change the spirit, content, or intention of the Convention. Two implementing agreements

[9] http://www.grida.no/graphicslib/detail/definitions-of-the-arctic_12ba#
[10] *The International Bathymetric Chart of the Arctic Ocean (IBCAO) Version 3.0, Geophysical Research Letters, doi: 10.1029/2012GL052219.*
*[Auxiliary Material]*
[11] http://www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm

under UNCLOS already exist, the 1995 UN Fish Stocks Agreement[12] (UNFSA) and the 1994 Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982[13] (The Mining Agreement) – both of which apply to the Arctic Ocean. Apart from these two implementing agreements UNCLOS provides only outline rules and general provisions, and to a large degree, lacks operational detail.

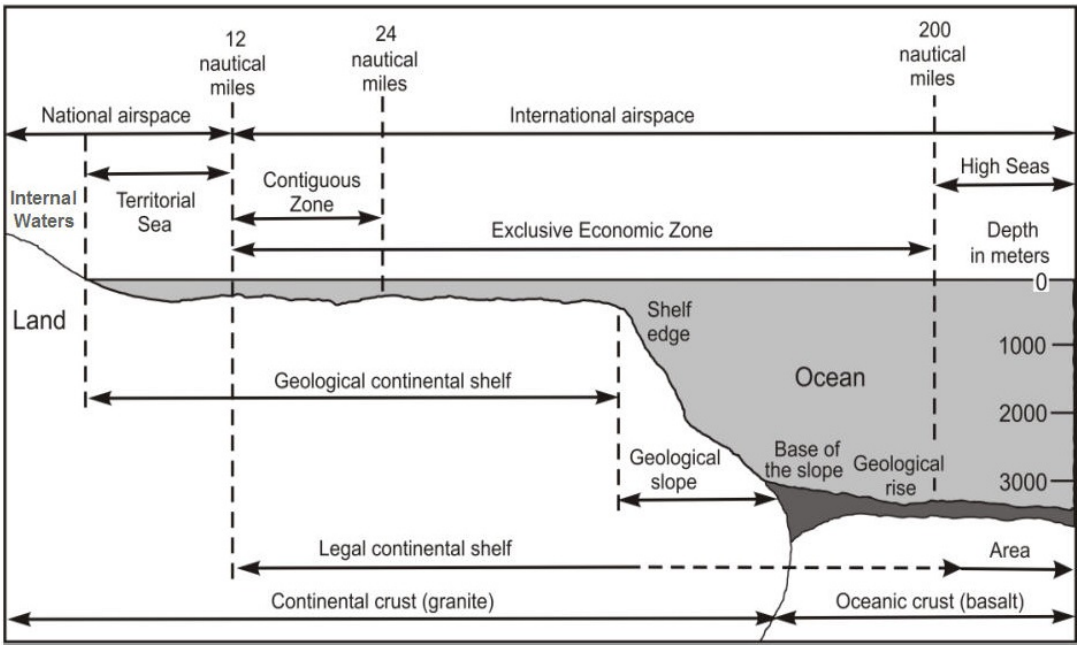



**Figure 2.** UNCLOS Maritime zones. (Adapted from Berkman *et. al.,* 2013)

### 2.1.1. Special consideration for semi-enclosed seas

The geographical characteristics of the Arctic Ocean, being almost completely surrounded by several coastal states, means that it is afforded the special status of a semi-enclosed sea, under the UNCLOS provisions enshrined Part IX of UNCLOS. Under Article 123 of that, those states bordering the Arctic Ocean are obliged to:

> "*cooperate with each other in the exercise of their rights and in the performance of their duties under this Convention. To this end they shall endeavour,* ***directly or through an appropriate regional organisation***:
>
> (a) *to coordinate the management, conservation, exploration and exploitation of the living resources of the sea;*
>
> *(b) to coordinate the implementation of their rights and duties with respect to the protection and preservation of the marine environment;*
>
> *(c) to coordinate their scientific research policies and undertake where appropriate joint programmes of scientific research in the area;*

[12] http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm
[13] http://www.un.org/depts/los/convention_agreements/texts/unclos/closindxAgree.htm

*(d)* ***to invite, as appropriate, other interested States or international organisations to cooperate with them*** *in furtherance of the provisions of this article* (emphasis added).

### 2.1.2. International legislation for ice-covered areas

Under UNCLOS Article 234 of the Convention, coastal states also enjoy the freedom to adopt and enforce appropriate rules and regulations within their Exclusive Economic Zones (EEZs) with regard to marine pollution issues[14] in ice-covered areas. This valuable provision allows states to develop legislation specific to their own geographical context, and in relation to activities of third parties.

### 2.1.3. Negotiations towards a future international BBNJ instrument under UNCLOS

In 2004, in response to concerns that existing governance fails to adequately deal with high seas' issues relating to biodiversity, the United Nations General Assembly (UNGA) established the UN Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction (the BBNJ Working Group[15]). The BBNJ Working Group has addressed a range of topics relating to the protection of biodiversity in the high seas as well as enhanced governance measures. Following the United Nations Conference on Sustainable Development in June 2012, the UNGA adopted Resolution 66/288 on 27 July 2012. Paragraph 162 recognizes *"the importance of the conservation and sustainable use of marine biodiversity beyond areas of national jurisdiction"*. Two factions have emerged, the majority of States which recognise the need for a new instrument and a smaller number of States that opt for better implementation of existing instruments. To resolve this it was agreed at Rio+20 (June 2012) that by the end of the 69th session of the UNGA, to be held in August 2015, States would have to decide whether to launch negotiations. Work continues on this within the BBNJ Working Group.

While not Arctic-specific any new instrument would be applicable in the high seas of the Arctic Ocean. Such an instrument should, ideally, be based on the precautionary principle and stipulate that no new fisheries can be established until clearly defined assessments of their potential impacts on target and non-target species as well as on local and indigenous populations are carried out. Other principles on which to base such an instrument include ecosystem-based management or the ecosystem approach; best scientific and technical

[14] Article 234 states: "*Coastal States have the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas within the limits of the exclusive economic zone, where particularly severe climatic conditions and the presence of ice covering such areas for most of the year create obstructions or exceptional hazards to navigation, and pollution of the marine environment could cause major harm to or irreversible disturbance of the ecological balance. Such laws and regulations shall have due regard to navigation and the protection and preservation of the marine environment based on the best available scientific evidence*".

[15] http://www.un.org/depts/los/biodiversityworkinggroup/biodiversityworkinggroup.htm

information and advice; polluter pays and common but differentiated responsibility. Further considerations and principles include[16]:

- International cooperation
- Environmental assessment and impact assessments
- Establishing marine protected areas
- Liability and redress
- Peaceful resolution of conflicts and disputes
- Benefit sharing
- Compliance, enforcement, monitoring, control and surveillance
- Genetic resources
- Inclusion of non-members
- Emergency response
- Transparency and accountability
- Adaptive conservation management

An Arctic-specific implementing agreement under UNCLOS is unlikely to be viable. Kiourova *et al*., (2009) point out that as UNCLOS is a global agreement any negotiation process would fall under the auspices of the United Nations General Assembly (UNGA) – a global body. The UNGA would decide on the overall objective, scope, and main elements of an Implementing Agreement as well as determine the rules of procedure for its negotiation. There is currently no precedent for an implementing agreement with a regional scope. It is also unlikely that the five Arctic Ocean coastal states would either support or participate in a negotiation process involving around 180 states with opposing views (*ibid*.)

## 2.2. Role of other bodies and instruments

The Convention on Biological Diversity[17] (CBD) (in force 29 December 1993) provides a definition of biodiversity[18] , aims to promote its conservation, sustainable use of its components and fair and equitable sharing of benefits arising from the use of genetic resources[19]. The CBD has an important role in the identification and endorsement of marine areas which, because of uniqueness, vulnerability or threat, need protection and/or preservation. The designation of Marine Protected Areas (MPAs) and the development of appropriate management plans for these sites, however, is the responsibility of the appropriate competent bodies. Within EEZs this is the role of the coastal state. The CBD has been instrumental in the development of the UN BBNJ working group. At its second meeting (November 1995, Jakarta, Indonesia), the Conference of the Parties (COP) to the CBD agreed on the "*Jakarta Mandate on Marine and Coastal Biological Diversity*"[20] which led to the development of a work programme and subsequent meetings of the COP have, amongst

[16] The considerations and principles set out in the list and preceding paragraph and are derived from, for example, Nowlan, 2001; Rayfuse, 2008; Pew Environment Group, 2012; Co-Chairs of the BBNJ Working Group, 2012; Stoessel et al., 2014 as well as the ACCESS project
[17] http://www.cbd.int/
[18] CBD definition: *Biological diversity - means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems*. CBD Convention, Art. 2
[19] In areas beyond national jurisdiction, the Convention applies only to processes and activities carried out under the jurisdiction or control of its parties.
[20] Jakarta Mandate https://www.cbd.int/doc/publications/jm-brochure-en.pdf

other things, promoted international cooperation in ABNJ, developed options for protection of deep seabed genetic resources and convened an expert workshop on the scientific and technical aspects of Environmental Impact Assessments (EIA) in ABNJ.

In areas beyond national jurisdiction (the high seas and the Area[21]), the relevant sectoral bodies that have the mandate to control usage are, for shipping, the International Maritime Organization (IMO); for seabed mining in the Area, the International Seabed Authority (ISA) and, for fishing, the regional fisheries management organizations (RFMOs) - should they exist.

A complex array of global, regional and national instruments relate to specific sectors including shipping and tourism, fishing and oil and gas activities. These are listed in Annexes I-IV and discussed in Section 6. These include the International Maritime Organization[22] (IMO) instruments on marine pollution and safety at sea, regional fisheries instruments and bilateral fisheries agreements, legislation covering Arctic search and rescue and oil pollution as well as various non-binding guidelines.

### 2.2.1. The Arctic Council

Established in 1996 by the Ottawa Declaration[23] from the earlier Arctic Environmental Protection Strategy (AEPS), the Arctic Council is a forum for promoting cooperation, coordination, and interaction among the Arctic States, with the involvement of the Arctic Indigenous communities and other Arctic inhabitants on issues such as sustainable development and environmental protection. The Council comprises eight states, all with territory in the Arctic, six “permanent participants” groups (indigenous peoples groups). Observers comprise twelve non-Arctic state countries, nine intergovernmental and inter-parliamentary organization and eleven non-governmental organizations. The Council’s activities are carried out through six working groups:

- 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)

As a ‘soft law’ body the Council was not established to provide a means to formulate legally binding agreements. However, it can provide the auspices under which binding regulations can be established. From a governance perspective it can only make recommendations and develop non-binding guidelines. Nevertheless, the Council is a strong voice influencing policy making in the Arctic. Its status as a soft law body allows the Council to circumvent the stringent formalities set out in international law and also allows the participation of non-state actors. The establishment of a permanent secretariat in Tromsø in 2013 and the signing of the two binding agreements, the 2011 Arctic Search and Rescue Agreement (Arctic SAR

[21] UNCLOS, Art. 1.1(1) *"Area" means the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction.*
[22] http://www.imo.org/Pages/home.aspx
[23] The Ottawa Declaration 1996. Available at: http://www.arctic-council.org/index.php/en/document-archive/category/4-founding-documents

Agreement) [24] and the 2013 **Agreement on Cooperation on Marine Oil pollution, Preparedness and Response in the Arctic** (Arctic Oil Spill Response Agreement)[25], negotiated under the auspices of the Council could be viewed as a shift in the Council's role.

As observed in 2012 by The Standing Committee of Parliamentarians of the Arctic Region[26] (SCPAR) the negotiation of such agreements usually only involves states and, therefore, the original cooperation structure in the Arctic Council , involving Permanent Participants, the Working Groups and the observers, may be somehow lost in the process (SCPAR, 2012). SCPAR further observed, that to be truly effective and autonomous, the Arctic Council needs to be more than a coordinating instrument acting by consensus of its members and should become a fully-fledged international organization, with an autonomous treaty mandate sanctioned by its members, the eight Arctic states, to give them more formal inter-governmental binding powers (*ibid*).

There is a requirement for the Arctic Council states to retain dialogue with non-Arctic States since international law requires this for High Seas' fisheries and Seabed ABNJ, even in waters the Arctic Council considers theirs to manage (see Section 2.1.1. above).

We particularly note the intention of UNCLOS Article 123, relating to semi-enclosed seas, sub-paragraph (d), *"to invite, as appropriate, other interested States or international organisations to cooperate with them in furtherance of the provisions of this article"*, suggesting a strong reason for external entities to join with the bordering coastal states to implement the aims of Article 123. The Arctic coastal States and Arctic Council should welcome the input and cooperation from organisations (such as the EU). On the other hand, the Arctic Council would consider is already complies with the law by operating these provisions both "directly" and through the Arctic Council "an appropriate regional organisation".

### 2.2.2. Arctic Ocean coastal states

In May, 2008 representatives of the five Arctic Ocean coastal states (Canada, Denmark, Norway, the Russian Federation and the United States of America) issued the Ilulissat Declaration[27]. The Declaration notes that "*The Arctic Ocean stands at the threshold of significant changes*" and that an existing '"*extensive international legal framework"* applies to the Arctic Ocean. It continues that *"(B)y virtue of their sovereignty, sovereign rights and jurisdiction in large areas of the Arctic Ocean the five coastal states are in a unique position*

[24] http://www.arctic-council.org/index.php/en/document-archive/category/20-main-documents-from-nuuk
[25] http://www.arctic-council.org/eppr/agreement-on-cooperation-on-marine-oil-pollution-preparedness-and-response-in-the-arctic/
[26] The Conference of Parliamentarians of the Arctic Region (CPAR) is a parliamentary body comprising delegations appointed by the national parliaments of the Arctic states (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, U.S.A.) and the European Parliament and also includes Permanent Participants representing Indigenous peoples, as well as observers. The conference meets biennially. The Standing Committee of Parliamentarians of the Arctic Region (SCPAR) is responsible for the work between conferences. One of the main priorities of the Standing Committee was originally to support the establishment of the Arctic Council. The new organization, representing the eight Arctic states and the European Parliament and founded on 19 September 1996 has worked to promote the work of the Council. The Committee participates in the meetings of the Arctic Council as an observer. http://www.arcticparl.org/
[27] http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf

*to address*" the "*possibilities and challenges*" facing the Arctic Ocean due to climate change and melting ice.

Since their first meeting in 2008 officials of the five coastal states have held further meetings[28]: A ministerial meeting in Chelsea, Canada in March 2010[29], fisheries meetings at the level of senior officials in Oslo in June 2010[30], Washington D.C. in April and May 2013[31] and Nuuk, in February 2014[32]. There have also been meetings of scientific experts from the Arctic Ocean coastal states on Arctic Ocean fish stocks in Anchorage, the United States in June 2011[33], and Tromsø, Norway, in October 2013[34]. At the most recent meeting of senior officials, in February 2014, a consensus was reached to protect the central Arctic Ocean from unregulated fisheries. (See section 6.2.1.2.4.)

### 2.2.3. OSPAR (Convention for the Protection of the marine Environment of the North-East Atlantic)

OSPAR is the mechanism by which fifteen Governments of the western coasts and catchments of Europe[35], together with the European Union, cooperate to protect the marine environment of the North-East Atlantic. It results from the unification in 1992 of the Oslo Convention against dumping and the Paris Convention covering land-based sources and the offshore industry. A new annex on biodiversity and ecosystems was adopted in 1998

The main objectives of the OSPAR Convention[36] are to prevent and eliminate pollution and to protect the maritime area against the adverse effects of human activities so as to safeguard human health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely affected. The guiding principles are:

- Ecosystem Approach
- Precautionary Principle
- Polluter Pays Principle
- Best Available Techniques (BAT)
- Best Environmental Practices (BEP)

[28] The meetings of the Arctic Ocean coastal states have been viewed as contentious by some observers. The exclusion at the Ilulissat Conference of non-coastal Arctic States was unpopular with some other members of the Arctic Council. See, for example, (http://www.cbc.ca/news/canada/north/iceland-upset-by-arctic-summit-snub-1.885441).
[29] http://www.mid.ru/brp_4.nsf/0/5E2FEF2614D7AE2BC32576F600592DE5
[30] https://www.regjeringen.no/globalassets/upload/ud/vedlegg/folkerett/chair_summary100622.pdf
[31] http://www.state.gov/e/oes/rls/pr/2013/209176.htm
[32] http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCEQFjAA&url=http%3A%2F%2Fnaalakkersuisut.gl%2F~%2Fmedia%2FNanoq%2FImages%2FNyheder%2F250214%2FChairmans%2520Statement%2520from%2520Nuuk%2520Meeting%2520February%25202014%25202.docx&ei=WUXLVNbXJIKBUdXXgJgL&usg=AFQjCNEpHnUseWOF5N3hsgkKGHv4p_FXWw
[33] https://drive.google.com/file/d/0B7Ms4DWlSyj9SUFHMW9TbTZZLWs/view?pli=1
[34] https://docs.google.com/file/d/0B3KmDd5a2QBOV1lIT29aX0RwdlU/edit?pli=1
[35] OSPAR Contracting Parties: Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom, together with the European Union.
[36] http://www.ospar.org

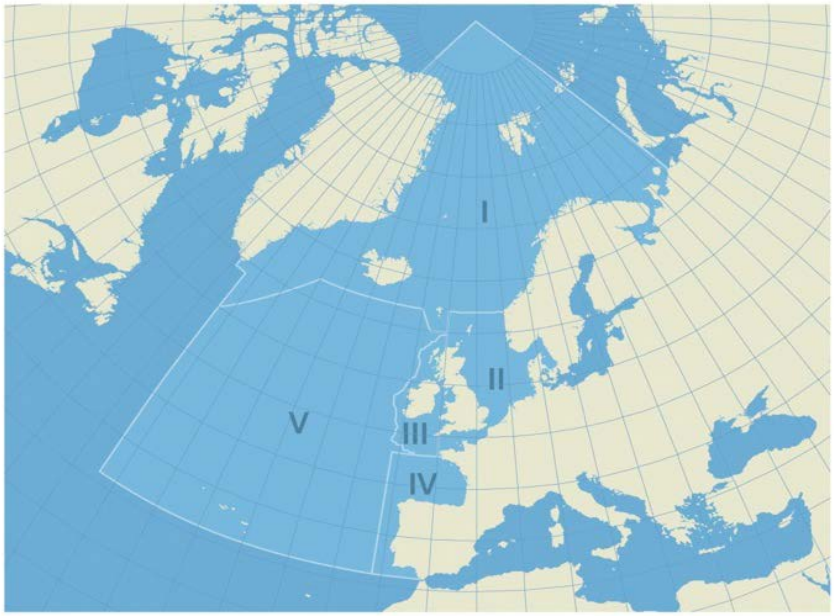



**Figure 3.** OSPAR Maritime Area. Region I - Arctic Waters; Region II – Greater North Sea; Region III – Celtic Seas; Region IV – Bay of Biscay and Iberian Coast; Region V – Wider Atlantic (Source: http://www.ospar.org/)

OSPAR Region I (Arctic Waters) (Figure 3) covers approximately 5.5 million square kilometres. That sector of the Arctic Ocean which falls within Region I represents only approximately 8% of the total surface area of the Arctic Ocean (OSPAR, 2000).

Two OSPAR Contracting Parties, Denmark[37] and Norway, are Arctic coastal states. In theory the OSPAR boundaries could be widened, but as the Convention was developed to support a defined maritime area this has not happened (Barry-Pheby, 2013).

OSPAR already has a record of collaboration in the Arctic region. OSPAR and the North-East Atlantic Fisheries Commission (NEAFC) signed a Memorandum of Understanding[38] in September 2008. Both organisations have competences for the segment of the Arctic region and aim to co-operate to deliver an ecosystem approach in association with the International Council for Exploration of the Sea (ICES). However, OSPAR's application, along with many others, to become an observer to the Arctic Council was declined at the 2013 Ministerial Meeting. Nevertheless OSPAR Decisions (which are binding on Contracting Parties) Recommendations and Agreements provide regional regulations and guidance for at least part of the Arctic Ocean. This includes OSPAR Decision 98/3 on decommissioning of installations at sea, protocols for toxicity testing and environmental monitoring guidelines all of which are referred to in the 2009 Arctic Council's Offshore Oil and Gas Guidelines (AOOGG)[39]. Arctic Council products have informed and been factored into OSPAR Quality

[37] Greenland is party to OSPAR via Denmark's ratification

[38] OSPAR /NEAFC MoU: http://www.ospar.org/html_documents/ospar/html/mou_neafc_ospar.pdf

[39] AOGG available at: http://www.pame.is/images/03_Projects/Offshore_Oil_and_Gas/Offshore_Oil_and_Gas/Arctic-Guidelines-2009-13th-Mar2009.pdf.

Status Reports (QSRs)[40] (pers. comm. David Johnson, ex OSPAR Commission Executive Secretary).

The Commission's *Strategy for the Protection of the Marine Environment of the North-East Atlantic 2010–2020* states that OSPAR will endeavour to work with partner organisations (including the Arctic Council) on aspects of climate change and ocean acidification including monitoring, assessing, adapting and mitigating. Under the strategy OSPAR Contracting Parties negotiating measures within other fora will act to promote consistency. The strategy also sets out that OSPAR will assess the suitability of existing management measures for oil and gas activities in Region I and, where necessary, will offer to contribute to the work on offshore oil and gas activities taking place under the Arctic Council, specifically under the Protection of the Arctic Marine Environment Working Group (PAME).

## 2.3. The European Union and the Arctic

### 2.3.1. EU approach to Arctic Policy

Europe's relationship with the Arctic has been evolving over a number of years. Between 2008 and 2014, the EU institutions have adopted a number of political, non-binding acts, Communications, Resolutions and Conclusions, addressing with varying emphasis the main priority themes of environmental protection, sustainable use of resources, and international cooperation.

The EU Council in its conclusions of March 2014[41] has instructed the Commission and the High Representative to present proposals for the further development of an integrated and coherent Arctic policy by December 2015.

As regards governance, the EU fully acknowledges the extensive legal framework that already exists in the Arctic. To strengthen and enlarge this framework, international dialogue and cooperation is encouraged, in particular through the Arctic Council. The 2012 Communication (European Commission and the High Representative, 2012) extols the role of the EU in research and funding in the north while also acknowledging the need to recognize and cooperate with Arctic institutions and actors. The need to respect the concerns and enhance the well-being of local populations, particularly indigenous peoples is also acknowledged.

The Council Conclusions of March 2014 recognized "*the Arctic Council as the primary body for circumpolar regional cooperation"* and noted the EU commitment *"to work actively as an observer of the Arctic Council and contribute to its activities"* agreeing that EU observer status "*would facilitate an even more effective EU contribution to Arctic cooperation*" and stressing "*the important role played by EU Member States in the Arctic Council as members and observers in promoting cooperation in the Arctic in accordance with their respective status".*

For the EU the path to observer status at the Arctic Council has not been a smooth one, although it has been regularly observing proceedings since its application. After a number of deferrals an affirmative response was given in 2013, depending however on a final decision to be taken by consensus at the Arctic Council Ministerial meeting in 2015. The reason

[40] OSPAR QSRs: http://qsr2010.ospar.org/en/index.html
[41] http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/EN/foraff/142554.pdf

behind the deferral has been attributed at least in part to a disagreement between the EU and Canada over a ban on seal products initiated by the European Parliament in 2009[42]. The ban, which came into force 20 August 2010, has become the basis of a long running disagreement culminating in the involvement of the World Trade Organisation (WTO).

### 2.3.2. Other EU – Arctic interactions

In addition to its relationship with the Arctic Council the EU interacts with Arctic states via a number of different routes. The most important cooperation frameworks are the Northern Dimension and the Euro-Barents cooperation.

#### *2.3.2.1. The Northern Dimension[43]*

The Northern Dimension (ND) is a joint policy between EU, Russia, Norway and Iceland. The ND Policy was initiated in 1999 and renewed in 2006. The policy aims at providing a framework to promote dialogue and concrete cooperation; strengthen stability, well-being and intensified economic cooperation and promote economic integration, competitiveness and sustainable development in Northern Europe. The renewed ND comprises four operational partnerships: the Environmental Partnership, the Partnership in Public Health and Wellbeing, the Partnership on Culture and the Partnership on Transport and Logistics as well as an ND Business Council and an ND Institute.

#### *2.3.2.2. Barents Euro-Arctic Council[44]*

The Barents Euro-Arctic Council (BEAC) is the forum for intergovernmental and interregional cooperation in the Barents Region. BEAC was established in 1993, by signing the Kirkenes Declaration on January 11, 1993 in order to "*provide impetus to existing cooperation and consider new initiatives and proposals*". A second Kirkenes Declaration was issued in June 2013, by the heads of participating countries of BEAC. Barents regional cooperation currently consists of 13 member regions and 3 observers. Not only is the EU an important source of finance for programmes but it has a role to play in supporting successful arctic cooperation as well as being a major destination for the resources and goods from the region. Consequently many EU policies and regulations have implications for Arctic stakeholders (Barents Regional Council, 2013).

#### 2.3.2.3. Other Interactions

[42] Regulation (EC) No 1007/2009 of the European Parliament and of the Council on trade in seal products. The aim of the Regulation is to ensure that products derived from seals are no longer found on the European market. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009R1007&from=EN
The Regulation allows for some exemptions to respect the fundamental economic and social interests of Inuit and other indigenous communities. Exceptions also apply for goods derived from seals for personal and non-commercial use and for goods derived from seals hunted for the sole purpose of the sustainable management of marine resources on a not-for profit basis and for non-commercial reasons.
[43] http://www.northerndimension.info/
[44] http://www.beac.st/in-English/Barents-Euro-Arctic-Council

Furthermore, the EU maintains close relations with Iceland and Norway via the EEA (European Economic Area) Agreement, by which relevant legislation in sectors relevant for the Arctic such as environment and research applies to those two countries.

The EU has further an elevated potential for cooperation with the Nordic Council of Ministers[45], as the NCM member states,(Denmark, Finland, Iceland, Norway and Sweden with the Åland Islands, Faroe Islands and Greenland as associate members and Estonia and Latvia as observers ) all are either members of the EU or have close associations with it. The Nordic Council of Ministers (NCM) has a revolving Arctic Co-operation Programme.

Greenland, which is part of the Kingdom of Denmark but decided to leave the EU, remains associated to the EU as an Overseas Countries and Territories Member, and is further bound to the EU by multiannual partnership agreements for sustainable development.

**Section Summary**

- There is already an extensive governance framework in the Arctic Ocean
- There is a wide range of actors and interests, involving Arctic and non -Arctic actors
- The governance landscape is evolving
- Need for Arctic Council to retain dialogue with non-Arctic states

# 3. INDIGENOUS PEOPLES AND ARCTIC GOVERNANCE

Use of the term 'indigenous peoples' risks masking the diverse mix of peoples (Figure 4), cultures and perspectives encircling the Arctic Ocean.

Arctic indigenous peoples' participation in governance is similarly diverse (ACCESS Report D5.61). A network of indigenous organizations exists at national and supranational levels throughout the Arctic. Indigenous populations are increasingly aware of and encouraged by international recommendations for their inclusion in decision-making processes however their representation in traditional national institutions is still considered by them as insufficient (*ibid*.). Within Arctic states, important disparities exist for the participation of indigenous peoples in political choices and decisions affecting them and it is difficult to distinguish a global pan-Arctic trend in the evolution of indigenous political participation (*ibid*.).

[45] http://www.norden.org/en/theme/arktis/nordic-co-operation-in-the-arctic


**Figure 4.** *Map showing Demography of indigenous peoples of the Arctic based on linguistic groups. Source: Arctic Centre. http://www.grida.no/graphicslib/detail/demography-of-indigenous-peoples-of-the-arctic-based-on-linguistic-groups_12f2. Cartographer/designer: Hugo Ahlenius, UNEP/GRID-Arendal*

The indigenous peoples of the Arctic are represented in and by various fora, for example, the Arctic Council as 'Permanent Participants'[46] the Sámi Council, Inuit Circumpolar Council, the Barents Euro-Arctic Council, the Northern Dimension, the UN Permanent Forum on Indigenous Issues as well as through various land claims and treaty settlements. Important issues, raised by Steipen *et al*., (2014) were reiterated by the indigenous representatives at the ACCESS workshop referred to below: i) it is not always clear what the purpose of consultations are and ii) too much consultation overburdens indigenous institutions with complex procedures and large quantities of documents, often without clarity on the consultation outcome - it is not always clear what changes follow indigenous contributions.

[46]The Permanent Participants of the Arctic Council, which comprises six indigenous peoples' organizations, have full consultation rights in connection with the Council's negotiations and decisions – but no voting rights.

## 3.1. Indigenous peoples and climate change

Climate change has direct and indirect impacts on indigenous livelihoods and societies. Indigenous peoples' hunting whaling, fishing activities are affected as sea, weather conditions and the availability and health of harvested species change (Stepien *et al.,* 2014). While not all negative, such changes have the potential to impact on indigenous economies, societies, culture and health. Overall such impacts are perceived to be having increasingly adverse effects on indigenous livelihoods (*ibid*.).

A collaborative workshop between Arctic indigenous people's representatives[47] and ACCESS researchers identified a number of themes relating to climate change and Arctic governance. The representatives at the workshop reported that, in the marine environment, retreating sea ice, longer time periods between freeze-up and melting, changes in sea water salinity, changes in direction and strength of winds as well as, on land, melting permafrost and precipitation falling as rain rather than snow are all impacting on ways of life for indigenous peoples in the Arctic.

In the context of adaptive capacity and vulnerability to climate change Stepien *et al.,* (2014) propose that empowerment of indigenous peoples needs to be primary response offering Arctic governance "*a safe passage between the need for active adaptation polices and the danger of new state interventionism and paternalistic policies*". To be effective and meaningful policy needs the participation of local actors. This cannot take place without the empowerment of local communities. Self-governance, self-determination, strengthening local governments and co-management arrangements are all vital elements of empowerment (*ibid*.).

## 3.2. Traditional Knowledge

The inclusion of Traditional Knowledge[48] (TK) or traditional ecological knowledge (TEK) in policy making was identified as a concern for the indigenous representatives. The Traditional Knowledge and experience of indigenous communities can provide a sound basis for the development of strategies for adaptation to climate change[49]. The 1992 Convention on Biological Diversity (CBD) encourages states, subject to national legislation, to "*respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the*

[47] ACCESS Newsletter 10

[48] Although there is no generally agreed definition of Traditional knowledge, the World Intellectual Property Organization (WIPO) proposes that at an international level, in a general sense TK embraces the content of knowledge itself as well as traditional cultural expressions, including distinctive signs and symbols associated with TK. In a narrow sense WIPO proposes that TK refers to knowledge as such, in particular the knowledge resulting from intellectual activity in a traditional context, and includes know-how, practices, skills, and innovations.

[48] CBD, Article 8(j) *In-situ Conservation*

*equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices"*[50].

Incorporating TK into decision making should help governance institutions to promote economic development that is environmentally and socially sustainable and which reflects the precautionary principle. By incorporating TK into negotiation and implementation of international agreements and decision-making processes it can help to operationalize two key concepts: those of intergenerational thinking and sustainability (Fenge and Funston, 2009). However, the authors also warn that debates about TK are often focussed towards "*reformatting*" such knowledge into databases of use to scientists and policy makers. They argue that it is the scientists and policy makers that need to *"broaden their thinking to accommodate values, approaches and conclusions grounded in the TK of Arctic indigenous peoples*". Cameron (2012) similarly voices concern over the use of TEK in research and policy making. The concerns relate to problems of translation, representation and de-contextualisation where information based on TEK is taken out of the holistic spiritual systems and local practices and used as data for western science. A further concern expressed by the indigenous representatives was that indigenous communities should have an opportunity to assess how and where their TK will be used and to be able to disallow its use if they disapprove.

Governance is frequently imposed from outside the Arctic and, as a consequence, often fails to understand the unique conditions and circumstances that prevail. Ignoring TK, which has been relied on successfully for millennia, impacts negatively on communities, livelihoods and the environment. A well-documented example of policy making which has failed to consider traditional understanding and knowledge and has placed institutional constraints on adaptation is the Norwegian government's approach to the Sámi reindeer herders in northern Norway (Annex VI).

## 3.3. Co-production of knowledge and knowledge sharing

The development of governance and policy needs to be sensitive to and aware of the many perspectives of the indigenous peoples. Decisions that relate to indigenous peoples are often made based on assumptions rather than on certain knowledge. The environmental and social changes occurring in the Arctic make the funding, development and strengthening of indigenous research institutions essential both to broaden the knowledge-base from which information is derived and to enable indigenous peoples to make greater contributions to Arctic research. Keeping the results of Arctic research in the Arctic was also a concern of the indigenous representatives who felt that too often the results of both social and natural science research were taken out of the Arctic. The best available scientific or technical information (or advice) is well established as an essential element for successful decision making. The co-production of knowledge shared equally between indigenous communities and orthodox scientific research is a vital component in the quest to understand climate change impacts – both natural and social. It is already evident that, in response to climate change, some communities in the Arctic have begun deploying adaptive co-management strategies and communications infrastructure, combining traditional and scientific knowledge (IPCC, 2014). In some regions indigenous Arctic communities are already providing observations of climate change impacts. Such observations complement and enrich more orthodox scientific data and, in particular, help to provide relevant information for local adaptation efforts, see for examples, Huntington, 2011; Krupnik *et al*., 2011, ACIA, 2005b).

## 3.4. Co-management

Climate change is presenting opportunities for development in the Arctic. The co-management between the local indigenous peoples and industry of such development is an important consideration. One example of such a venture is the Red Dog Mine in Alaska[51]. The mine, which is one of the largest zinc mines in the world, was developed in 1982 under an innovative operating agreement between NANA[52] and Teck Alaska, Inc.

## 3.5. Communication

Communication is a significant issue for Arctic communities. In order to fully participate in knowledge sharing and decision and policy-making processes good communication networks are fundamental. However, while some communities have fast internet connections for others there is limited or no internet access. Local radio is often the main means of disseminating information (USA and Canada). Transport is often difficult and expensive. Language is another potential barrier to communication. Translation into the local dialects can be an expensive and lengthy process.

**Section Summary**

- Diverse participation in governance of indigenous peoples across Arctic sates
- Traditional knowledge should be incorporated into the policy-making process
- There is a need for funding, development and strengthening of opportunities for indigenous research and co-production and sharing of knowledge
- Reasons for and results of consultations with indigenous peoples should be shared
- Balance needed between overburdening with consultations and exclusion
- Co-management arrangements between industry and indigenous peoples should be explored
- Limited or no access to means of communication restricts participation in knowledge sharing and decision making processes

# 4. ENVIRONMENTAL GOVERNANCE

ACCESS has a sectoral approach and is tasked with exploring specific sectors of activity. Nevertheless environmental impacts are overarching and environmental governance touches all sectors of human activity in the Arctic Ocean. Sector-based regulation, while a necessary component of environmental management, does not always address integrated issues and complex environments Stoessel *et al.* (2014). A number of environmental instruments, while not specifically linked to any individual activity, are of relevance in the Arctic Ocean (Annex V).

In addition to formal arrangements Stoessel *et al.*, (2014) give examples of informal approaches and initiatives that play an important role in the Arctic (Table 1) and suggest that such approaches are characterised by a lesser degree of institutionalisation, cooperation

[51] http://www.reddogalaska.com/
[52] NANA Regional Corporation was formed in 1972 as a for-profit Alaska Native corporation

emerging on an ad hoc basis, less complex decision making processes and less formal cooperation structures – such has verbal agreements.

**Table 1.** Examples of informal approaches focused on environmental governance in the Arctic (Source: Stoessel et al., 2014)

| | Type of approach | Description |
|---|---|---|
| 1 | Government initiatives involving non-governmental groups | Co-management of resources and wildlife: empowering local communities by allowing independent choice of practices and ways to achieve government goals |
| 2 | Cooperation between researchers and local communities | Involving researchers and local communities in providing vital information for projects and bridging the gap between science and local knowledge |
| 3 | Cooperation between NGOs and local communities | Involving NGOs as donors and project managers and local communities in implementing project objectives |
| 4 | Initiatives governed by local communities | Involving local communities who have sought alliance for a common cause within their community and inside or outside their region |
| 5 | Cooperation initiatives between researchers or research institutes | Involving researchers and institutes with a common research interest in the Arctic |

All of these approaches offer potential pathways by which to respond to the rapid changes underway in the Arctic Ocean.

Chapin and Hamilton (2009) propose that, while useful to consider policy *options,* policy *pathways* may be an even more appropriate approach to environmental governance as the idea of pathways specifically allows for an adaptive management approach and an evolution of policy over time. They note that, particularly in the face of so much uncertainty, there is a need to adopt a precautionary approach to Environmental Governance. They suggest that the pathway approach would allow a precautionary beginning to environmental protection (precaution to environmental protection in the form, for example, of moratoriums on certain activities in specific regions, and then, once warranted by the evidence, a gradual easing of environmental restrictions. The concept of pathways also encourages a plurality of approaches within and among the governing institutions involved, which would, hopefully be informed by a shared set of principles and improved through dialogue on emerging best practices. Furthermore pathways can emerge, diverge and merge as needed (*ibid.*)

Chapin and Hamilton (2009) offer the following set of principles as a starting point for governance of Arctic marine ecosystems:

***"The principle of fit** – create arrangements that avoid or minimize spatial and temporal mismatches among biophysical systems, socioeconomic activities, and governance practices. Multi-level governance is an example of this principle. Different system components operate at different scales, and effective regime design implies attention to relevant scales.*

***The principle of multiple use** – develop integrated approaches that can mediate among different uses of marine resources and establish priorities when such uses are incompatible.*

***The principle of cooperation** – ensure that all interested stakeholders have a voice in decision-making and decisions are made in a transparent fashion at the appropriate level of governance.*

***The principle of adaptive management*** *– design and operate governance systems to promote adaptation and social learning as knowledge improves regarding the relevant biophysical systems, human activities, and their interactions.*

***The principle of policy flexibility*** *– marine ecosystems in the Arctic are changing rapidly. The ecosystem functions requiring protection will be different to what we have now. Attention solely to the issue-based threats is thus highly unlikely to be effective unless framed within an overarching context. Resilience, learning, and ecosystem-based management are all significant elements of this principle.*

***The principle of precaution*** *– Any environmental governance framework needs to recognise that preserving healthy ecosystems and functioning ecosystem services requires a precautionary approach, especially in conditions as pristine and vulnerable as those found in the Arctic. This would ideally entail putting regulations in place before human activities increase. "*

## 4.1. Ocean Noise

Anthropogenic noise in the marine Arctic has been one of the foci of ACCESS research. An increase in vessel traffic as well as oil and gas activities in the warming Arctic will inevitably lead increased noise in the marine environment. Increased noise in an environment that was previously relatively calm is likely to have a range of impacts on marine mammals in the area. There is a growing consensus about the potential impact of man-made sound on marine fauna. Awareness of this issue has been reinforced by a series of strandings coinciding with the exposure to man-made sound sources. Anthropogenic originated sound can affect cetaceans in different ways, and these effects can be on an individual or group level (ACCESS Report D4.52). ACCESS Report D4.51 shows clear overlaps between maritime traffic, predicted future hydrocarbon exploration sites and marine mammal distributions in the Arctic Ocean. Anthropogenic originated sound can affect cetaceans in different ways, and these effects can be on an individual or group level. The question of how and why man-made sound affects marine mammals is controversial (ACCESS Report D4.52). The report lists a range of impacts:

- Masking
- Habitat displacement
- Physical trauma
- Auditory loss
- Behavioural changes
- Behaviour conditioning effects

A number of instruments (Annexes II, VI & V) refer to underwater noise – either directly or indirectly. Most recently the IMO has approved voluntary guidelines[53] for the reduction of underwater noise from commercial shipping. However, anthropogenic sound in the ocean is

[53] Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life.
http://www.ascobans.org/sites/default/files/document/AC21_Inf_3.2.1_IMO_NoiseGuidelines.pdf

an area in need of further research and regulatory attention, identifying and building on examples of best practice.

**Section Summary**

- Range of approaches to environmental governance from formal to informal ad hoc cooperation offer possible responses to rapid changes
- There is little international legislation relating to underwater noise. Current legislation is at state or sub-state level. This is an area which requires regulatory attention, building on examples of best practice
- More research is needed to better understand the impacts of underwater noise

# 5. GOVERNANCE INDICATORS

Indicators perform many functions. Their use can result in better decisions and more effective actions by simplifying, clarifying and making aggregated information available to policy makers. They can help incorporate physical and social science knowledge into decision-making, and they can help measure and calibrate progress toward sustainable development goals. They can also provide an early warning to prevent economic, social and environmental setbacks. They can also be useful tools for communicating ideas, thoughts and values (United Nations, 2007).

The past two decades have seen the emergence of both social and environmental indicators. Examples include the United Nations Development Programme (UNDP) Human Development Index[54] (HDI) in 1999 and, more recently, the Inequality–adjusted Human Development Index[55] (IHDI) in 2010. Within the Arctic Council, work to develop Arctic Social Indicators has been undertaken by the Sustainable Development Working Group[56]. Environmental indicators, such as those included in the European Environment Agency Indicator sets[57] are well established. Indicators of governance are less well developed. Whilst the use of indicators such as employment, infrastructure, human development, profit/loss, conflicts and people satisfaction are available for socio-economic indicators; similar 'ready-made' governance indicators are not available. A number of studies include proposals for indicators of governance, although none are quantifiable. The United Nations guidelines and methodologies for indicators of sustainable governance (United Nations, 2007) identified a number of new indicators, including governance, but points out that the indicators for the theme 'governance' are largely undeveloped and that significant methodological work is needed to develop good, measurable, internationally accepted indicators in this area. Similarly, the Global Environment Facility Transboundary Waters Assessment Programme[58] (GEF TWAP) proposes an assessment of governance architecture although the methodology remains to be developed (IOC-UNESCO, 2011). Work on this is now underway.

[54] http://hdr.undp.org/en/content/human-development-index-hdi
[55] http://hdr.undp.org/en/content/inequality-adjusted-human-development-index-ihdi
[56] http://www.arctic-council.org/sdwg/wp-content/uploads/2014/08/Arctic-Social-Indicators-II-May-2013-Ministerial-Meetingv2.pdf
[57] EEA Indicators: http://www.eea.europa.eu/data-and-maps/indicators/#c5=&c7=all&c0=10&b_start=0
[58] http://www.geftwap.org/

The changing environmental, economic, social and policy landscapes in the Arctic make it essential that governance arrangements are closely monitored to assess their impact and effectiveness and, if necessary, amend. Work within ACCESS to develop a suite of indicators for effective Arctic governance identified eleven potential core indicators, variables and indices based on six goals and targets (Table 2).

The goals, targets and indicators are based on concepts identified within the literature (see for example, Ehler, 2003; Breitmeier *et al*. 2006; 2011; Mahon *et al*., 2011; Young, 2011). The importance of concepts such as 'knowledge', 'effectiveness', 'transparency', 'enforcement' and 'compliance' emerged. Effectiveness was considered in relation to concepts such as: the translation of international commitments to domestic obligations and behavioural effectiveness, in terms of state compliance with regime components (Breitmeier *et al*., 2006; 2011). These concepts are mirrored in the 'Good Governance' theme identified within the monitoring report for the EU sustainable development strategy (Eurostat, 2011), which uses the '*number of infringement cases*' and the '*transposition rate of law by national authorities*' to assess the success of governance regimes. In the wider context of Arctic Governance, these examples were used to develop both the goal/target of '*coherent governance*', addressing the presence of disputes between states, and '*effective development of governance regime*', addressing the level at which international obligations have been carried out within Arctic States.

Further development of the indicators focussed on finding sources of suitable data and information. These had to be readily available, comparable across the Arctic, regularly updated and quantifiable. Table 2 describes a set of potential governance indicators identified that might be used for the Arctic Ocean and it also illustrates the limitations associated with each indicator. It should be noted that in addition to the difficulty of identifying metrics that represent the criterion in question such as effectiveness, cohesion, inclusion or adaptation, a further problem associated with indicators of governance is causality. Is it possible to attribute any changes in these criteria solely to a governance system? The work by ACCESS on governance indicators can provide a foundation for further studies on the identification and development of metrics for use in the marine Arctic.

**Table 2.** Final set of Arctic governance indicators and the associated limitations. Green: Potential indicators with good data sources and available data. Light orange: Potential indicators with identified data sources, but limited by data availability/coverage of data. Dark orange: Potential indicators but limited by their subjectivity or difficulty in the identification of a potential data source.

| DIMENSION | GOALS / TARGETS | HEADLINE INDICATOR | INDICATOR | Summary of Limitations |
|---|---|---|---|---|
| Governance | Effective development of governance regime | Development and implementation of policy | Rate of development of policy | Able to summarise development in a timeline; issue with verification of policy stages must be considered. |
| | | | Implementation of policy – rate of transposition by national authorities (whether international commitments have been translated into domestic obligations) | Unable to identify forum through which progress in 'domestic obligations' is documented |
| | Inclusive | Engagement / | Degree of engagement / | Similar to 'Inclusion and |

| | | | | |
|---|---|---|---|---|
| | policy making | participation in policy making | participation (which coastal states, other states, institutions, NGOs, observers, industry, indigenous / local communities, working groups) are involved in policy /agreement formulation | Representation' headline indicator; difficult to assess participation of different stakeholders (particularly the local population and indigenous people) across different scales |
| | Informed governance | Scientific knowledge | Trends in dissemination of knowledge: No. of policy briefs, peer reviewed publications, publically available reports, media coverage, public meetings | May be possible to assess the use of scientific knowledge in developing a new form of governance, but assessing its use in previous policies s is difficult |
| | | Traditional knowledge | Degree of acknowledgement and inclusion of cultural values / traditional knowledge into decision making processes | Similar to 'Inclusion and Representation' as well as 'Engagement/Participation in Policy Making' headline indicators. |
| | Cohesive governance | Cohesiveness | Degree to which policy is cohesive between / within sectors / States | Subjective and limited to isolated examples |
| | Effective governance | Goals and targets | Clearly defined goals / targets towards which progress is measureable | Unable to identify a forum through which progress towards goals is documented |
| | | Transparency | Degree of transparency - of decision making process and procedures | Degree of transparency is subjective |
| | | Compliance | Degree of compliance: number of transgressions / infringements recorded | Possible for high-profile companies; issue with verification of company transgressions must be considered |
| | | Enforcement / sanctions | Number of times sanctions /other enforcement measures are imposed | Unable to indentify standard forum in which sanctions are documented |
| | Adaptive governance | Continuity and feedback | Institutional capacity and mechanisms to review, assess progress and adapt policy towards sustainable development. | Can be done on a case by case basis. Difficult to identify sources of data and those which are related to climate change |

**Section summary**

- There has been little work to date on indicators of effective governance
- Difficult to identify Arctic-specific data sources
- Problems to separate Arctic and non-Arctic data from national data sets
- The success or failure of governance arrangements will need regular monitoring
- There is a need to develop indicators of effective Arctic governance

# 6. CLIMATE CHANGE AND GOVERNANCE IN THE SECTORS STUDIED BY ACCESS

ACCESS reports, D5.11[59], D5.21[60] comprised a comprehensive review and analysis of relevant instruments, agreements and guidelines relating to the ACCESS themes of marine transportation and tourism, fisheries and resource extraction. A diagram and tables of current Arctic-relevant regulatory instruments relating to fisheries, oil and gas activities and marine transport and tourism are attached in Annexes I, II, III and IV.

## 6.1. Arctic maritime transport and marine tourism

### 6.1.1. Shipping

#### 6.1.1.1. Impacts of climate change on Arctic shipping

Decreasing sea ice is the most significant aspect of climate change in relation to shipping in the Arctic Ocean. Both intra and trans-Arctic Ocean routes, at least in theory, offer possible future seasonal alternatives to existing shipping routes.

Over recent years the decrease in sea ice extent has encouraged an increasing volume of shipping. AMSA (2009) and PAME (2013) both indicate that there will be less increase in vessel traffic via the Northwest Passage (NWP) than the Northern Sea Route (NSR). One driver for the use of Arctic Ocean routes is the reduction in sea miles compared to the much long routes using the Panama or Suez Canals[61] as long as there is no sea ice present. Nevertheless there are restraints on the growth of shipping and the relationship between changes in sea ice coverage and shipping are by no means clear cut. The Arctic Marine Shipping Assessment (AMSA, 2009) suggests that there is a possibility of an ice-free Arctic Ocean for a short period in summer perhaps as early as 2050 which would mean the disappearance of multi-year ice, as no sea ice would survive the summer melt season. It continues that it "*is highly plausible there will be greater marine access and longer seasons of navigation, except perhaps during winter, but not necessarily less difficult ice conditions for marine operations*". So, while a trans-Arctic Ocean crossing may be theoretically possible, it might be too difficult and costly to be worth the effort, especially in winter where there would 2200 nautical miles of ice along the route. The more ice encountered along a navigation route, the slower the ship's speed. This could easily negate the shorter distance gained as expensive polar-class ships, ice-breaking cargo carriers, would still be required for most operations (Brigham, 2010). AMSA (2009) questions whether Arctic routes are economically viable citing the limited navigation season as the most significant challenge.

A further driving force for Arctic shipping, in addition to sea ice retreat, is development of natural resource development in the Arctic. The continuing development of natural resources requires Arctic marine transport systems to move cargoes out of the Arctic to

[59] ACCESS report D5.11: Analysis and synthesis of extant and developing regulatory frameworks
[60] ACCESS report D5.21: Current governance options for ACCESS sectors/themes
[61] The Northern Sea Route is a substantially shorter passage (35-60 percent savings in distance) for shipping between northern European ports and those of the Far East and Alaska than routes through the Suez or Panama Canals (The Arctic Marine Shipping Assessment, (AMSA) 2009)) – as long as there is no sea ice present

global markets. A good indication of this driver is that nearly all the commercial carriers along the NSR today are bulk carriers, tankers and liquefied natural gas (LNG) carriers.

#### 6.1.1.2. Existing and developing governance options for Arctic shipping

The main governance challenges, identified by ACCESS, facing marine transport in the Arctic, now and over the next three decades are:

- The unification of the application and enforcement of ship rules. (IMO mandatory rules and standards for ships operating in polar waters, and coastal state rules such as Russia's NSR rules and Canada's Canadian Arctic Pollution Prevention Regulations.)
- Prediction of transport scenarios and understanding of the lengths of the navigation seasons for the NSR and NWP.
- Inclusion of international economic interests (Arctic natural resource developments) as well as regional / local administration governance and coastal communities (for example local economic and fishery interests); environmental protection and pollution prevention; spatial planning.
- Insurance, liability and compensation arrangements for all Arctic Ocean shipping and marine operations

Existing instruments covering maritime transport and tourism in the Arctic Ocean are listed in Annex II. Current legislation, which includes both binding and non-binding conventions and guidelines, covers:

- Discharge and emissions
- Ballast waters
- Antifouling
- Construction, design, equipment and manning
- Operational training
- Safety of life at sea
- Search and rescue
- Environmental protection
- Safety of navigation, ships routing, reporting, vessel traffic services
- Contingency planning and preparedness
- Insurance, liability, compensation

However, despite this extensive panoply there has been no binding legislation that specifically covers the uniquely harsh conditions found in polar waters. Predictions that polar shipping will grow in volume and diversify in nature over the coming years (see, for example AMSA, 2009; International Chamber of Shipping, 2014; Keil, 2013a) have prompted the development, by the International Maritime Organisation (IMO), of a mandatory Polar Code which, after lengthy negotiations, will be fully adopted (SOLAS, MARPOL and STCW amendments) by April 2015. The IMO Polar Code is to be implemented by 1 January 2017.

The development of a mandatory International Code of safety for ships operating in polar waters will fill some of the gaps in existing international shipping rules and standards. The

development of the Code has been via amendments and additions to the existing SOLAS[62] and MARPOL[63] instruments. Previously, the only mandatory regulations covering shipping were global in nature and took no account of the uniquely harsh conditions encountered in polar waters. The new Code will cover design, construction, marine safety equipment, operational, training and environmental protection issues. When in force the Code will ensure that ships transiting or operating in the Polar Regions must meet prescribed standards of construction and materials and crews must have the stipulated level of training. The new Code includes mandatory measures covering safety part (part I-A) and pollution prevention (part II-A) and recommendatory provisions for both (parts I-B and II-B).

As the Code is formulated as a goal-based standard, the details have to be interpreted by individual states. As a consequence it is likely that national and local governance will exert a strong influence. Similarly, enforcement will be by individual states. The insurance industry may gain some reassurance from the requirement for an ice regime methodology to be included on Polar Shipping Certificates (Burris, 2014). The mandatory Code will require evaluation of risks based on a risk index according to the ice conditions likely to be encountered in the geographical areas through which the ship is intending to travel. The Polar Code is a seminal advance for the marine insurance industry, the ship classification societies, shipbuilders, ship owners and investors.

While filling many of the earlier gaps in shipping legislation in the polar environment the new Polar Code does not cover all polar marine safety and environmental protection issues.

Some issues remain be addressed. There is little if any discussion within the new Code of the impacts of climate change. There is currently no Arctic-specific ballast water convention; however, a global oceans ballast convention is near ratification**.** By comparison, guidelines exist for ballast water exchange in the Antarctic Treaty area[64] and include instructions for vessels that take on ballast in the Antarctic and plan to discharge the ballast water in Arctic, sub-Arctic, or sub-Antarctic waters. A way to rectify this gap may be through Arctic-specific additions to existing instruments such as the IMO Ballast Water Convention[65] or the development of separate guidelines. To date no MARPOL "special areas"[66] have been defined in the Arctic. The impact of noise on marine mammals is also not addressed.

Further significant gaps in regulation of Arctic shipping relate to insurance, liability and compensation in the event of accidents. The current international system for compensation for pollution damage caused by ship-source pollution is fragmented and limited. The geography of the Arctic Ocean as a closed sea makes trans-boundary pollution impacts one of the most difficult issues facing the legal and policy community (Rosen and Asfura-Heim, 2013). Unlike most other areas of shipping, marine insurance is not regulated in an international convention but is legislated at the national level or sometimes a sub-national level. The UNCLOS principles of flag state control and freedoms of the high seas mean that

[62] SOLAS: IMO International Convention for the Safety of Life at Sea 1974
https://treaties.un.org/doc/Publication/UNTS/Volume%201184/volume-1184-I-18961-English.pdf
[63] MARPOL: IMO International Convention for the Prevention of Pollution from Ships
http://www.imo.org/KnowledgeCentre/ReferencesAndArchives/HistoryofMARPOL/Documents/MARPOL%201973%20-%20Final%20Act%20and%20Convention.pdf
[64]http://globallast.imo.org/2012/Individual%20Guidelines%20for%20reference/Antarctica%20MEPC.163%2856%29.pdf
[65] The International Convention for the Control and Management of Ships Ballast Water & Sediments
http://globallast.imo.org/index.asp?page=mepc.htm&menu=true
[66] MARPOL defines certain sea areas as **"special areas"** in which, for technical reasons relating to their oceanographical and ecological condition and to their sea traffic, the adoption of special mandatory methods for the prevention of sea pollution is required. Under the Convention, these special areas are provided with a higher level of protection than other areas of the sea.

it is possible that owners of ships (or rigs) involved in an incident will be a citizen of non-Arctic state and so may be beyond the effective enforcement jurisdiction of all the affected Arctic coastal states (Rosen and Asfura-Heim, 2013). Separate conventions address oil pollution liability and compensation from tankers (CLC)[67]; damages from the spill of bunker fuel carried in ships other than tankers, such as cargo ships; and hazardous and noxious substance spills from ships[68]. The 1992 Fund Convention, which is supplementary to the 1992 CLC, establishes a regime for compensating victims when compensation under the 1992 CLC is not available or is inadequate. None of the conventions address damage to the high seas beyond national jurisdiction.

MacInnis (2012) suggests that the existing international regime provides polluters more protection than deterrence. Citing that, under the 1992 CLC, it is almost impossible to prevent a ship owner from limiting liability. He points out that insurers, ship owners and the oil industry welcome the predictability of this regime. However he also points out that an Arctic regime focusing on prevention will need to include liability that will establish a financial incentive for ship owners and cargo interest[69] to invest in prevention and environmental protection.

The use by Arctic coastal states of their Port State Control authority to fill regulatory gaps is proposed by Rosen and Asfura-Heim (2013) and Molenaar (2014). Rosen and Asfura-Heim (2013) suggest that Port States insist that ships which enter the Arctic carry adequate insurance (well in excess of current IMO limits), are not allowed to evade responsibility because of the various limits on liability schemes and *force majeure* defences and are subject to external Oil Companies International Marine Forum (OICMF) and Protection and Indemnity (P&I) Club[70] inspections to ensure that the ships are complying with all relevant equipment standards. Molenaar (2014) suggests that Port State Control (PSC) initiatives could be developed within the existing arrangements, such as the Paris Memorandum of Understanding[71] (MoU) – assuming the Paris MoU has the highest stringency and performance levels of the regional PSC Arrangements. He proposes that the Russian Federation might follow Canada by subjecting its ports to the Paris MoU. Additional proposals include further initiatives within the Paris MoU to harmonise and coordinate inspection and corrective enforcement action relating to existing standards. He suggests that

[67] International Convention on Civil Liability for Oil Pollution Damage (CLC). Adopted 29 November 1969; Entry into force: 19 June 1975; Replaced by 1992 Protocol: Adopted 27 November 1992; Entry into force: 30 May 1996. http://www.iopcfunds.org/fileadmin/IOPC_Upload/Downloads/English/Text_of_Conventions_e.pdf

[68] International Convention on Civil Liability for Bunker Oil Pollution Damage (BUNKER). Adopted 23 March 2001; Entry into force: 21 November 2008

[69] Cargo Interest: an insurable interest connected with cargo (source: http://maritimedictionary.org/ASP/MarineDictionary.asp?word=cargo&page=3)

[70] P&I Clubs are an association of shipowners that have grouped together to insure each other on a mutual non- profit-making basis, for their third-party liabilities. (http://northpublications.com/lp_guides/Insurance_And_Loss_Prevention/files/assets/basic-html/page14.html)

[71] Paris MoU on Port State Control. The geographical range of the Paris MOU, a voluntary organisation consisting of 27 maritime administrations, covers the European coastal States and the coastal States of the North Atlantic basin from North America to Europe including the west coast of Canada. Arctic Ocean coastal states that are signatories are Canada, Denmark (Greenland), Russian Federation and Norway. The objective of the Paris MoU is to eliminate the operation of sub-standard ships through a harmonized system of port State control. More than 18,000 inspections take place on board foreign ships annually in the Paris MoU ports to ensure that international safety, security and environmental standards are met and that crew members have adequate living and working conditions.

similar guidance and instructions could be developed with the Tokyo MoU[72]. An alternative to using existing PSC Arrangements could be through establishing a new Arctic Ocean/region Memorandum of Understanding (Molenaar, 2014). However, he notes that most of the shipping engaged in intra- or trans-Arctic marine shipping will use ports subject to either the Paris or Tokyo MoUs.

## 6.1.2. Arctic Marine Tourism

### *6.1.2.1. Impacts of climate change on Arctic marine tourism*

Tourist numbers to the Arctic are predicted to rise in the future. This is due to a range of factors including increasing accessibility due to sea ice retreat and the desire to visit pristine landscapes as well as the desire to visit before they disappear (doom tourism). A future driver may also be the redistribution of tourists to higher latitudes and altitudes as temperatures in traditional tourist destinations come be increasingly high (Hamilton *et al*., 2005). Brigham (2010) suggests that the cruise ship industry's interest in the Arctic, particularly the voyages along Greenland's west coast, is in keeping with the expansion of tourism to once-remote destinations everywhere.

While offering the potential for employment for local and indigenous people this may prove to be a mixed blessing. Representatives of Arctic indigenous peoples present at the 2014 ACCESS workshop identified a number of tourism-related issues:

- Influx of tourists may have a negative impact on local communities and environment and may destroy precisely what the tourists come to see.
- Tourism needs to be managed with care both environmentally *and* culturally[73].
- Any infrastructure, such as hotels, will need to be maintained – even out of the tourist season and may put financial pressure on the communities.
- There is potential for indigenous peoples to run tourist activities as they understand the region and the culture.

### *6.1.2.2. Existing and developing governance options for Arctic marine tourism*

There is currently an array of voluntary guidelines addressing tourism in the Arctic and Polar Regions more generally (Annex II). While the IMO provides generic guidance for vessel security in ice areas[74] there is no specific legislation relating to tourism in the Arctic Ocean.

[72] MoU on Port State Control in the Asia-Pacific Region (Tokyo MoU) is a voluntary inter-governmental co-operative organisation on port State control in the Asia-Pacific region, consisting of 19 member Authorities. Arctic Ocean coastal States that are signatories to the MoU are Canada, Russian Federation, while the USA holds observer Authority status. The objective of the MoU is to establish and maintain effective systems of port State control within member States with a view to ensuring that, without discrimination, foreign merchant ships calling at a port of its Authority, or anchored off such a port comply with the standards laid down in the relevant instruments as defined in Section of the MoU text.

[73] An example of a tourist cruise ship arriving in Alaskan waters and disturbing the traditional whale hunting season was cited.

[74] IMO Guidelines for Ships Operating in Polar Waters
http://www.imo.org/Publications/Documents/Attachments/Pages%20from%20E190E.pdf

The World Wide Fund for Nature (WWF)[75] and the Association of Arctic Expedition Cruise Operators (AECO)[76] provide voluntary guidelines for both tour operators and tourists visiting the Arctic (and Antarctic[77]) but these will need to be carefully integrated with the Polar Code and other developments in order to maintain an appropriate regulatory framework.

The growing numbers of tourists in the Arctic has prompted the Arctic Council to more fully address the issue of sustainable Arctic tourism. In 2006 the Arctic Council issued *The Sustainable Model for Arctic Regional Tourism Report* (Arctic Council, 2006) and, in a renewed effort to address sustainable tourism across the Arctic, at the 2013 Kiruna Ministerial Meeting, the Council supported the development of a cross-cutting initiative centred on strengthening sustainability within the tourism industry[78] and has now established The Arctic Marine Tourism Project (AMTP)[79]. *The Arctic Shipborne Tourism Initiative* (ASTI*)* is the first in a suite of renewed efforts to analyse and promote sustainable tourism across the circumpolar Arctic. Organised by the Protection of the Arctic Marine Environment (PAME) working group, the aim of the initiative is to develop an '*Arctic Marine Tourism Best Practices*' document, to be presented to Arctic Council Ministers for consideration in spring 2015, that will:

- Avoid duplication by being aware of existing guidelines and best practices;
- Identify existing best practices while also determining any practical problem areas or actual issues requiring some resolution;
- Take into account regional variations, categories of tourist/vessel operations, various stakeholder perspectives, and practical us ability of a best practices document;
- Consider the intended audience(s) for development of best practices.

There is a further possibility of producing brochures, handbooks, or other guidance material based on the document for use by those directly involved in or affected by the Arctic shipborne tourism industry. PAME may also consider lending support for, or incorporate by reference, material from other sources where the material is deemed sufficient.

## 6.2. Seafood production - fisheries and aquaculture

## 6.2.1. Capture fisheries

#### *6.2.1.1. Impacts of climate change on capture fisheries in the Arctic Ocean*

It is by no means certain that there will be any new fisheries emerging in the high seas of the Central Arctic Ocean during the ACCESS 30 year time-frame. However, evidence is emerging of the responses of fish stocks to changes in ice cover and ocean temperature. Ingvaldsen and Gjøsæter (2013) report that the migration and distribution of capelin is

[75] http://wwf.panda.org/what_we_do/where_we_work/arctic/what_we_do/tourism/
[76] http://www.aeco.no/guidelines/
[77] International Association of Antarctica Tour Operators http://iaato.org/guidelines-and-resources
[78] Kiruna Senior Arctic Official Report, Arctic Council, May 2013, pg. 46
[79] http://www.arctic-council.org/index.php/en/resources/news-and-press/news-archive/873-arctic-marine-tourism-project-taking-shape

influenced by these factors, as well as stock size and attribute a general expansion of the distribution area and a northward shift of high-concentration areas of capelin, to the high temperatures and low ice cover observed in the northern Barents Sea during the study period (1972-2010). Hop and Gjøsæter (2013) propose an expansion of capelin stock to the north and east – although with considerable fluctuations. They also suggest that, with an increase in temperature and a reduction in sea ice, polar cod may lose the ice-associated part of their life cycle and become more restricted in pelagic distribution during summer.

ACCESS report D3.11 predicts only small changes in the 'centre of gravity' of the North east Arctic cod fishery due to climate change during the early decades of the 21 century in North Atlantic sector. There is already evidence of rapid climate change in the Bering Sea where a major warming of bottom water is forcing cold-water species of fish and mammals northward and / or into decline (ACIA, 2004). Hollowed *et al*. (2013) suggest that any future expansion or movement of sub-Arctic commercial fish stocks is more likely to be from the Norwegian or Barents Seas rather than from the Chukchi and Bering Seas because the inflow of warm Atlantic water is stronger and greater access is afforded by the open water connection with the Arctic Ocean. They identify the potential of 17 species of fish and shellfish stocks or stock groups to establish viable resident populations in the Arctic. Even with a continued reduction in ice cover in the Central Arctic Ocean, potential future fisheries are likely to be mainly within the 200 mile zones of the coastal states (Hoel, 2014). While unlikely that groundfish such as cod and haddock will extend their ranges into the deep Central Arctic Ocean, pelagic species, like polar cod, may eventually be able to do so. This has raised concerns that vessels from distant water fishing nations might initiate an unregulated fishery in the high seas beyond the 200-mile zones of the five coastal states (Hoel, 2014).

Notwithstanding these predictions, it is considered that the impacts of climate change on fisheries are likely to be of a lesser magnitude than the effects of policy and management (Pers. com. ACCESS IP meeting; ACCESS Report D3.11; ACIA, 2004; Eide, 2007).

Important considerations regarding regulation of fisheries in the light of long term climate change in the Arctic Ocean are:

- Through what channels should any regulatory developments be undertaken?
- Should any new instruments be legally binding or non-binding?
- Should a single instrument or body be developed covering the whole Arctic Ocean or should a number of smaller instruments or bodies be developed covering the maritime zones of the coastal states and the central Arctic Ocean?
- Which states and other entities should participate in the development of such instruments or bodies?

#### *6.2.1.2. Existing and developing governance options for capture fisheries in the Arctic Ocean*

There are currently no commercial fisheries in the Pacific sector north of the Arctic Circle and fisheries in the high Arctic on the Russian, US and Canadian shelves are limited to small-scale subsistence fisheries, mostly for anadromous species[80] (Mueter et al., 2013). Large scale commercial fisheries already exist in the more southerly Arctic waters of the Bering Sea, Barents Sea (ICES area I), the Norwegian Sea, Spitzbergen and Bear Island (ICES

[80] Anadromous species start life in fresh water but spend most of their life at sea, returning to fresh water to spawn.

area II), the northern parts of Icelandic waters (ICES area Va) and Northeast Greenland (ICES area XIVa) and in the Northwest Atlantic only in parts of Baffin Bay.

To date, Norway is the only country prohibiting vessels flying its flag to fish in unregulated waters, which would include those of the Central Arctic Ocean. Apart from the area covered by the North East Atlantic Fisheries Commission (NEAFC) (Figure 5) and the Joint Norwegian-Russian Fisheries Commission (the Barents and Norwegian Seas) there is currently no international conservation and management regime in place in the Arctic Ocean in areas beyond national jurisdiction (ABNJ). While reduced sea ice and increasing water temperatures offer the potential for an expansion or relocation of existing capture fisheries or the emergence of new fisheries this is by no means certain. Any new fishing opportunities are likely to occur initially within coastal state maritime zones before occurring in the high seas (Molenaar *et al.,* 2014).

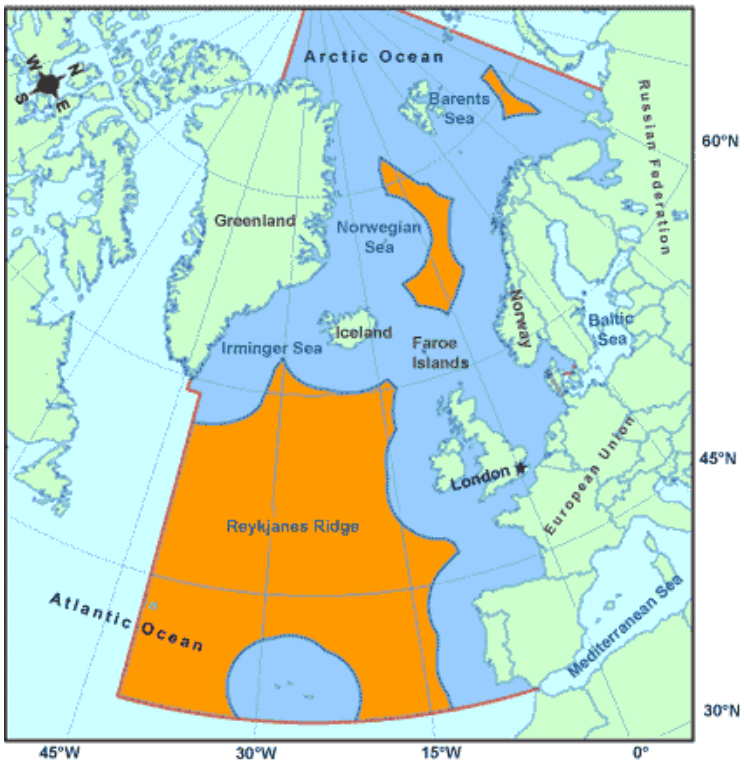



**Figure 5.** NEAFC. The area shaded blue: The Convention Area - comprising areas both within and beyond national jurisdiction. Areas shaded orange: The Regulatory Area - the waters of the Convention Area which lie beyond the waters under the fisheries jurisdiction of Contracting Parties (Source: http://www.neafc.org/system/files/neafc-ra-map-web-version.png)

### *6.2.1.2.1. Global instruments*

Annex III lists the main global instruments relevant to fisheries in the Arctic Ocean.
The UNCLOS and the United Nations Fish Stocks Agreement (UNFSA) provide a framework, setting out the overarching objectives and the rights and obligations of states. Implementation is either by individual states or a through Regional Fisheries Management

Organisation or similar arrangements[81]. While UNCLOS provides the overarching framework for ocean governance its primary aims in relation to fisheries are to establish the rights and obligations of coastal states and others within maritime zones and the high seas and to prevent over-exploitation of living resources. UNFSA relates solely to fisheries but applies only to straddling and highly migratory stocks. The Agreement elaborates on the UNCLOS framework, and introduces the precautionary approach[82] and promotes the ethos of ecosystem-based fisheries management. UNFSA also urges parties to "... *pursue cooperation in relation to straddling fish stocks and highly migratory fish stocks either directly or through appropriate subregional or regional fisheries management organizations or arrangements* ..." and to establish such organisations where none exist[83].

#### *6.2.1.2.2. Regional and bilateral instruments and arrangements*

A number of multilateral and bilateral fisheries instruments already apply to the Arctic waters. The majority of these apply to waters to the south of the Arctic Ocean - where most of the large scale commercial fisheries in Arctic waters currently take place while the more northerly fisheries comprise smaller scale subsistence and artisanal activities. This may however change in future. Many of the bilateral and multilateral agreements apply to single species transboundary stocks and relate to access, management, cooperation, scientific research and exchange of information. Molenaar (2014) lists a number of substantive fisheries standards that fisheries conservation and management authorities often use. These include:

- Restrictions on catch and effort
- Prohibitions on targeted fishing for designated species
- Minimum size limits for targeted species
- Maximum bycatch limits
- Gear specifications
- Temporal / seasonal or spatial closures

Some or all of these standards, or similar, are applied by many of the regional and bilateral organizations listed in Annex III within their conservation and management measures.

Two organisations develop science and provide advice to support the sustainable use of the oceans. The International Council for the Exploration of the Sea (ICES)[84], the organisation that promotes and coordinates marine research in the North Atlantic Ocean, the North Sea and Baltic Sea[85] in 2012 took the decision to enhance its scientific activities in Arctic waters. A similar decision was taken by the second organisation, the North Pacific Marine Science Organization (PICES)[86], which promotes and coordinates marine research in the northern North Pacific and adjacent seas - especially northward of 30 degrees North.

Despite the uncertainty over the future development of commercial fisheries in the high seas of the Arctic Ocean a number of governance options are under discussion for the 95.5% of this area not currently covered by an RFMO. The lack of commercial fishing activities in the

[81] UNCLOS Art. 118. Cooperation of States in the conservation and management of living resources
[82] UNFSA Art. 6 and Annex II
[83] UNFSA Art. 8.1 and 8.5
[84] http://www.ices.dk/Pages/default.aspx
[85] The Arctic has become a priority area for ICES research. http://www.ices.dk/explore-us/Action%20Areas/Pages/Arctic.aspx
[86] https://www.pices.int/

short term in the high seas makes the establishment of a new RFMO or Fisheries Arrangement as defined in the UNFSA unlikely – at least in the near future.

An alternative to creating an entirely new RFMO or fisheries agreement is to extend the spatial scope of NEAFC – whose mandate already extends into the Arctic Ocean to include the whole of the remaining area. The NEAFC Regulatory Area (Figure 5) currently covers the high seas areas of the Barents Sea, the Norwegian Sea and part of the Arctic Ocean of which it comprises approximately 4.5% of the surface area[87].

The European Commission, in its Arctic Communication of 2008[88], proposed extending the mandate of organisations such as NEAFC and that, until a conservation and management regime is in place for the areas not yet covered by such a regime, no new fisheries should commence. However, Molenaar (2009) suggests that there may be opposition by some Arctic Ocean coastal states to this approach. In particular from the USA and less so from Canada[89] – which would effectively become 'new coastal states' under an expanded NEAFC[90]. Concerns arise primarily from the allocation of TACs (Total Allowable Catch[91]) and even more so from the user interests of other states that are Non-Contracting Parties to the Convention. These include, amongst others, China and South Korea, which both have large distant water fleets.

A further option is to extend the spatial coverage of the other current fisheries arrangements. While the area of jurisdiction of a number of existing conventions, commissions and organizations encompass sub-Arctic and Arctic waters, apart from NEAFC none specifically include the Arctic Ocean. The lack of precise definitions of the boundaries of the following instruments and bodies means that they could potentially also be applicable to the Arctic Ocean: the current spatial scope is given in Annex VII):

- The North Pacific Anadromous Fish Commission (NPAFC)[92]
- Western and Central Pacific Fisheries Commission (WCPFC)[93]
- International Convention for the Conservation of Atlantic Tunas (ICCAT)[94]
- North Atlantic Marine Mammal Commission (NAMMCO)[95]
- North Atlantic Salmon Conservation Organization (NASCO)[96]
- The Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (CCBSP)[97]

[87] Calculated as the NEAFC area within the Arctic Ocean ~637,000 sq km (does not include the area south of Iceland/Greenland, which is primarily in the north Atlantic) and the total surface area of the Arctic Ocean as 14,090,000 sq km.
[88] COM(2008) 763, of 20 November 2008, Communication from the Commission to the European Parliament and the Council on 'The European Union and the Arctic Region', pp7-8.
[89] Canada is already a Non-Contracting Party with NEAFC.
[90] NEAFC coastal states currently comprise Russian Federation, Denmark (Greenland, Faroe Islands), Norway, Iceland and EU
[91] TAC: Total catch allowed to be taken from a resource in a specified period (usually a year), as defined in the management plan. The TAC may be allocated to the stakeholders in the form of quotas as specific quantities or proportions. (FAO definition)
[92] http://www.npafc.org/new/index.html
[93] https://www.wcpfc.int/
[94] https://www.iccat.int/en/
[95] http://www.nammco.no/
[96] http://www.nasco.int/
[97] http://www.afsc.noaa.gov/REFM/CBS/Default.htm

Other regional and bilateral instruments include the Pacific Salmon Commission (PSC)[98], Northwest Atlantic Fisheries Organization (NAFO)[99] and the Joint Norwegian-Russian Fisheries Commission[100] (Joint Commission) and NEAFC. The PSC is represented in the Arctic by the Yukon River Salmon Panel[101] the scope of which covers the Yukon River and its catchment in both the USA and Canada. The spatial scope of the Northwest Atlantic Fisheries Organization (NAFO) is clearly defined and does not encompass the Arctic Ocean although it may be possible to extend the spatial extent if appropriate. Molenaar (2014) points out that although the NEAFC Convention restricts NEAFC's competence to the North-East Atlantic sector of the Arctic Ocean the Joint Commission's constitutive instrument does not specify its spatial mandate. He suggests that while there may be some disagreement over the overlapping competencies there is little or no conflict between the conservation and management measures of NEAFC and the Joint Commission. In addition he notes that Norway and the Russian Federation form two-fifths of the NEAFC membership.

Other regional bilateral and trilateral fisheries arrangements of relevance to the Arctic Ocean are listed in Annex III.

An alternative to establishing a fishing organisation or organisations is an international agreement to place a moratorium on fishing in the highs seas of the Arctic Ocean until there is a better scientific basis on which to proceed. Rather than exploiting stocks the initial focus could then be on a coordinated pan-Arctic Ocean approach to data collection and research into the potential impacts of fishing on Arctic ecosystems, sustainability and development of an ecosystem –based approach across the high-seas and national waters. Such an undertaking might be coordinated by ICES / PICES, a new Arctic scientific body or possibly the Arctic Council.

#### *6.2.1.2.3. The Arctic Council and Arctic Ocean fisheries*

The Arctic Council is frequently proposed as the appropriate forum in which pan-Arctic decision making should take place. However, it is apparent that the Arctic Council has no desire to become involved in the governance of fisheries in the Arctic Ocean.

While veering away from direct involvement in fisheries management the PAME working group of the Arctic Council in The Arctic Ocean Review Final Report (PAME, 2013) proposes recommendations for fisheries resources:

- *"Fisheries resources should be managed in accordance with the law of the sea, relevant fisheries agreements and modern principles of fisheries management, including the precautionary and ecosystem approaches, also being mindful of the interests of the indigenous peoples of the Arctic.*
- *Fisheries resources should be managed based on the best scientific knowledge available, and necessary scientific understanding should be enhanced, including on changes in fish stocks.*
- *Fisheries resources in areas beyond national jurisdiction should be managed based on cooperation in accordance with international law to ensure long term sustainability of fish stocks and ecosystems.*"

[98] http://www.psc.org/
[99] http://www.nafo.int/
[100] http://www.jointfish.com/eng
[101] http://yukonriverpanel.com/salmon/about/yukon-river-salmon-agreement/

Despite its unwillingness to become involved in fisheries it is possible that that the Arctic Council could provide the impetus for a fisheries agreement.

### *6.2.1.2.4. Arctic Ocean coastal states and Arctic Ocean fisheries*

The 2008 Ilulissat Declaration[102] issued at the Arctic Ocean Conference in May 2008 by the five Arctic Ocean coastal states says that the existing legal framework, including the law of the sea, "*provides a solid foundation for responsible management […] of this Ocean through national implementation and application of relevant provisions*" and there is "*no need to develop a new comprehensive international legal regime to govern the Arctic Ocean*".

The five Arctic Ocean coastal states have held several meetings focussing on Arctic Ocean fisheries. A meeting of Officials from Canada, the Kingdom of Denmark, the Kingdom of Norway, the Russian Federation and the United States of America held in Washington, D.C. 29th April 29-1st May 2013[103] to discuss issues concerning possible future fisheries in the central Arctic Ocean agreed that there is currently no need to establish any additional RFMO or RFMO(s) for this area. However it was agreed that until it may become necessary to establish an additional RFMO or RFMO(s) it is desirable to develop interim measures, to include:

- Commercial fishing in the high seas of the central Arctic Ocean should only take place only pursuant to one or more regional or sub-regional fisheries management organizations or arrangements.
- Commercial fishing not conducted under such an organization or arrangement would be considered illegal, unreported and unregulated (IUU) fishing.
- States participating in the meeting should continue to improve the scientific understanding related to these issues. The interim measures could, potentially, serve as a framework to promote even stronger cooperation to advance this understanding.
- It was appropriate for States whose exclusive economic zones border this high seas area to take the initiative.
- Recognition of the interests of and engagement with Arctic residents, particularly the Arctic indigenous peoples.
- Future inclusion in talks of other States that may have an interest in the topic.

At the most recent, held in Nuuk, Greenland during February 2014, the officials affirmed that there "*is no need at present to develop any additional regional fisheries management organization (RFMO) or arrangement for this area*". However, while not opting for an outright moratorium on fishing in high seas of the central area of the Arctic Ocean "(*T)he meeting agreed on the desirability of developing appropriate interim measures to deter unregulated fishing in the future ...*"[104].

[102] http://www.oceanlaw.org/downloads/arctic/Ilulissat_Declaration.pdf Last accessed: 11 November 2013

[103] Meeting on the Future of Arctic Fisheries: http://www.state.gov/e/oes/rls/pr/2013/209176.htm

[104] http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCEQFjAA&url=http%3A%2F%2Fnaalakkersuisut.gl%2F~%2Fmedia%2FNanoq%2FImages%2FNyheder%2F250214%2F

#### *6.2.1.2.5. National legislation*

While most regulatory attention seems to have been focused on the highs seas it is probable that, at least within the short term, any changes in fisheries due to climate change will fall within EEZs and so be subject to national rather than international regulation. The existing areas in which states exercise jurisdiction are as a coastal state, a flag state, a market state and a port state and with regard to their natural and legal persons.

In order to discharge obligations under international law Arctic coastal states will have to develop national regulation to deal with vessels in search of new fishing opportunities and enforce and, where necessary, amend and strengthen existing regulations dealing with, for example, port state controls, IUU fishing. Management of Arctic Ocean fisheries will, ideally, include harmonisation of national regulations based on best practice, emphasising a precautionary and an ecosystem-based approach adapted to each region and particular stocks and fisheries. Development of new bilateral arrangements or realignment of existing arrangements may become necessary with any movement of existing stocks or emergence of new fisheries.

The traditional approach to managing fish stocks is the optimal utilization of stocks – species by species. However, increasing environmental concerns as evidenced by, for example, the 1987 Brundtland Report - Our Common Future[105] and the 1992 Agenda 21[106] and Rio Declaration[107] and reflected in a number of international developments, including within fisheries[108], has shifted the focus to a more integrated approach. The precautionary principal and the ecosystem approach have entered the vocabulary of fisheries' governance. National obligations now exist under the Convention on Biological Diversity (CBD) to conserve biological diversity. The UN Fish Stocks Agreement (UNFSA) and. The UN Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries provides a framework for national and international efforts to ensure sustainable exploitation of aquatic living resources.

In the Arctic Ocean there is currently a lack of any harmonized, overarching ecosystem-based fisheries management. Different fisheries management regimes operate within the coastal states, with states taking a variety of approaches to the emergence of new fisheries. Receding sea ice has opened up new areas and fishing opportunities which will require regulation. Fishing in areas or for fish stocks for which no conservation or management measures are in place "*and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law*" (FAO, 2001) may constitute IUU fishing. Molenaar (2014) notes that in some parts of the marine Arctic extensive, tailor-made national regulation and policy relating to all or most of the capacities in which jurisdiction can be exercised are expected to already be in place. These include as flag, coastal, port and market states and with regard to their legal and natural persons. Unregulated fisheries would be inconsistent with State responsibilities for the protection and conservation of the marine environment[109].

Chairmans%2520Statement%2520from%2520Nuuk%2520Meeting%2520February%25202014%25202.docx&ei=WUXLVNbXJIKBUdXXgJgL&usg=AFQjCNEpHnUseWOF5N3hsgkKGHv4p_FXWw

[105] http://www.un-documents.net/our-common-future.pdf

[106] http://www.unep.org/documents.multilingual/default.asp?documentid=52

[107] http://www.unep.org/Documents.Multilingual/Default.asp?documentid=78&articleid=1163

[108] Concerns within fisheries include overfishing, illegal, unreported and unregulated (IUU) fishing, by-catch and habitat destruction.

[109] UNCLOS, Art. 56

In December 2009, due to uncertainties about fish stocks and the lack of sufficient information to enable the design of sustainable harvest strategies within an ecosystem context the North Pacific Fishery Management Council (NPFMC) closed almost all the US Arctic Ocean (waters north of Bering Strait and within the US EEZ (Exclusive Economic Zone)) to commercial fishing "*until information improves so that fishing can be conducted sustainably and with due concern to other ecosystem components*"[110]. The Arctic Fishery Management Plan (FMP) governs all commercial harvests of fish in the Chukchi and Beaufort Seas, excluding marine mammals and birds. The region is closed to all commercial fishing for fish stocks other than Pacific salmon and Pacific halibut. These fisheries were already closed. The Pacific salmon fisheries in the Arctic were closed under a separate FMP[111] and Pacific halibut fisheries in the Arctic are prohibited by the International Pacific Halibut Commission[112]. To date the US is the only state that restricts new Arctic fisheries by its nationals.

Gaps / limitations in existing policy and regulatory framework relating to fisheries in the Arctic Ocean include:

1. High seas Regional Fisheries Management Organisation (RFMO) coverage is limited
2. The United Nations Fish Stocks Agreement (UNFSA) applies only to straddling and highly migratory fish stocks
3. There is a lack of data to inform science-based / ecosystem-based governance
4. Coastal state regulations vary widely - and in some cases may not be adequate.

### 6.2.2. Aquaculture

#### *6.2.2.1. Impacts of climate change on aquaculture in the Arctic*

Arctic aquaculture constitutes about 2% of global production volume (FAO, 2010) with Norway the dominant producer. The vast majority is salmon culture in the Norwegian sub-Arctic region, where comparably high sea temperatures and sheltered locations allow low-cost technology to be used. Despite the small contribution to global aquaculture production, aquaculture is important in the Arctic as a provider of employment in some rural areas with limited alternative livelihoods ( ACCESS Report D3.21) and the products of Arctic aquaculture meet a large demand – especially in Europe and, increasingly, in Asia. There is some aquaculture activity in Iceland, Russia, Canada (Quebec and Newfoundland), US (Alaska), Sweden and Finland. The latter two comprise mainly small volumes of freshwater species (ACCESS Report D3.21).

Temperature is a key parameter for aquaculture and rising sea temperatures will have a range of impacts on the activity. Some of these are, however, difficult to predict. Impacts that are predictable include fish growth and aquaculture productivity, the geographical areas that are biologically and physically suitable farming and opportunities for new species. Existing aquaculture activities in the Arctic are usually operating in less than optimal sea

[110] NPFMC, 2009 http://www.npfmc.org/wp-content/PDFdocuments/fmp/Arctic/ArcticFMP.pdf
[111] Fishery Management Plan for the Salmon Fisheries in the EEZ off Alaska. North Pacific Fishery Management Council. June 2012. > http://alaskafisheries.noaa.gov/npfmc/PDFdocuments/fmp/Salmon/SalmonFMPfinal1212.pdf
[112] http://www.iphc.int/

temperatures. Scenarios predicted for 2040 indicate that fish growth and productivity will benefit from the temperature increases. Some areas in the Norwegian sub-arctic are currently unavailable for farming due primarily to sea ice and icing conditions. These areas will gradually become available for aquaculture, extending the potential area and production capacity. Similar areas in the Russian sub-Arctic are also likely to be of more importance. In these regions a far larger area is currently unsuitable for cage-based aquaculture due to temperature and ice. It is , however, very unlikely that the expected changes in sea temperature will allow farming to take place outside of the sub-Arctic, for example, in Svalbard or further east than the Kola Peninsula.

#### 6.2.2.2. Existing and developing governance options for aquaculture in the Arctic

As aquaculture in Norway has been developing since the early 1970s the regulations are relatively detailed and mature. It is considered that there are unlikely to be major gaps in legislation. In terms of climate change, a potential drawback for adaptation is the stringent geographical restrictions to licenses which, once issued, cannot be moved between relatively large regions. While not solely climate-change related this issue needs to be considered following any relocation of this activity due to temperature changes. ACCESS Report D3.21 also highlights that some areas that open up to potential aquaculture activities may warrant special protection[113] and not being suitable for farming and note that this is an issue that needs evaluating (ACCESS Report 3.21).

Russia currently lacks systematic aquaculture legislation, as there is no general aquaculture law. This combined with a number of other factors including often strong military restrictions on the potential areas, could present a major hindrance to exploitation of aquaculture opportunities.

Transboundary governance problems may arise as aquaculture is taking place in both Norway and Russia. Legislation, operating standards and practices, particularly on hygiene and pathogen transfer, should be coordinated to limit the risk of disease transfer and development. This is an issue of high importance due to the current and predicted rapid growth in Russian aquaculture[114].

Ultimately, the management of aquaculture will be more important than temperature. In Norway municipal authorities decide where aquaculture is permitted so growth and adaptation will be largely dependent on these decisions. The temperature range across which aquaculture is taking place is relatively wide. The economic sustainability of the activity will depend on the management from both the industry and authorities, particularly of pathogen risks. Important areas of governance include technical standards, monitoring and compliance, sound farm location principles to limit risk of disease transfer between farms and adequate allocation of resources for vaccine and treatment research and development. These areas are also linked to potential climate change effects via, for example, storm strength and frequency and pathogen habitats. How the negative impacts of aquaculture on other sectors are balanced against industry growth is a further illustration of the importance of management within this sector. The current emphasis on precautionary approaches has

[113] For example to protect vulnerable habitat or indigenous use.
[114] There is likely to be a rapid development of aquaculture as Russia pushes towards self-sufficiency in food. The goal of the Russian Food Security Doctrine, to achieve self-sufficiency in various food products, includes fish products (82%).

restricted industry growth in a time of strong demand. In Norway the present restrictions on locating aquaculture sites, if unchanged, will restrict the industry's ability to adapt and take advantage of changing sea conditions – and will lower the potential economic output and welfare generated.

## 6.3. Oil and Gas

### 6.3.1. Impacts of climate change on oil and gas activities in the Arctic Ocean

Growing global demand for energy suggests that the hydrocarbon resources of the Arctic region have become important for future energy security. The expected persistence of fossil fuels (especially oil and gas) in the global energy mix, instability in oil-supplying countries in the Middle East, and the unclear future of nuclear energy after the Fukushima disaster all seem to render Arctic energy resources attractive (Keil, 2013b). Counterbalancing this are the difficulties of working under such extreme conditions, the potential for environmental disasters and the limited understanding of impacts on Arctic ecosystems and communities of the activities of the energy sector, including increased infrastructure development, in the Arctic Ocean. The unique operating conditions in the Arctic include extended periods of darkness, intense cold, sea-ice, reduced visibility, high winds and storms. In addition to these difficulties the Arctic Council (1998) lists unique environmental factors encountered in the Arctic:

- High intensity of habitat use during summer season
- Extreme seasonal ecological sensitivity variations
- Unique shore types (ice shelves, glacier margins, ice foot features, tundra coasts)
- Unique oceanographic and shoreline seasonal changes (open water, freeze-up, frozen conditions, breakup)
- Slower weathering and longer persistence of spilled oil

The same document lists further issues to be considered when operating in the Arctic waters:

- Remote logistical support:
- Need to improvise response using available means until support equipment arrives
- Safety in cold, remote areas
- Cold temperature effects on the efficiency of equipment and personnel
- Boat operations in ice-infested waters during transition periods, winter dynamic ice conditions
- On-ice operations in winter
- Seasonal daylight variability
- Minimization of damage to permafrost during land-based
- Staging and cleanup operations
- Need for aircraft for response logistics, surveillance, and tracking

### 6.3.2. Existing and developing governance options for oil and gas activities in the Arctic Ocean

Existing legislation relating to offshore oil and gas activities in the Arctic Ocean are listed in Annex IV.

There is currently no global treaty on authorising, operating and monitoring offshore oil and gas exploration and exploitation - principally because such activities fall within coastal states' jurisdiction - although any potential pollution may have wider impacts. There is also no global treaty on responsibility and liability for industrial offshore oil and gas activities – unlike tanker transport of oil, which does have a regime[115]. As offshore activities develop in the Arctic there is likely to be a need for seasonal regulations and spatial management measures.

The existing multi-layered regulatory regime is fragmented. National legislation varies widely. Legislation is not Arctic-specific and, generally, infrastructure is lacking. ACCESS Report D4.61[116] found that currently State regulatory authority may be invested in a single government body or, more commonly, divided between multiple ministries and departments - making deciphering the regulations a complex task. A spectrum of state regulation was found to exist in Arctic coastal states ranging from prescriptive requirements to performance-based regulation with most regimes containing a combination of both. For the Arctic states, the U.S. system can be considered the most prescriptive, while Norway's regulatory regime is mainly performance based; its regulations contain very few mandatory technical requirements, but establish objectives and performance levels to be attained. Greenland has a relatively new regime which is largely performance based and requires operators to adopt the best international practices. Variations also exist between individual jurisdictions in the use of legally enforceable regulations or non-binding guidelines to provide a minimum reference point (derived from government, industry or best practices). ACCESS Report D4.61 concluded that to be effective the regulatory regime must be coordinated between the different state authorities, particularly in areas such as oil spill and emergency response. The report proposed that performance-based regulation has advantages in promoting innovation and positive development, while more prescriptive approaches provides greater certainty regarding requirements and facilitates easier monitoring and enforcement. In view of the newly emerging nature oil and gas activities in the Arctic it is considered that the application of a performance based regulatory system would be preferable to a prescriptive one designed originally to be applied under very different operating conditions. Furthermore, prescriptive or very detailed regulations can lead to operators meeting only the minimum requirements - but no more, so limiting efforts toward continuous improvement.

Rosen and Asfura-Heim (2013) point out that oil rigs and associated structures are not covered by an IMO liability scheme and that there is currently no international instrument on liability and compensation resulting from spills from offshore oil rigs, pipelines, and associated production systems. Liability is governed solely by the laws of the coastal states. This includes the standards for liability and any limits on that liability. Rig operators, unlike ship-owners, do not have P&I clubs to act as a financial backstop and there is currently no comprehensive international instrument to deal with standards for licensing oil rigs, and their corresponding limits of liability/mandatory insurance requirements. Nevertheless, Rosen and Asfura-Heim (2013) note that many offshore producers are members of the Oil Companies International Marine Forum [117](OCIMF) system and use OCIMF inspectors to ensure that offshore rigs and terminals comply with industry safety and environmental standards. Rosen

[115] International Convention for the Prevention of Pollution from Ships MARPOL, in particular Annex I
[116] ACCESS report D4.61: Internal report covering governance observations and options: oil and gas exploitation
[117] The OCIMF is a voluntary association of oil companies with an interest in the shipment and terminalling of crude oil, oil products, petrochemicals and gas. Its remit covers tankers, barges, offshore support vessels and terminals and its advice extends to issues like shipping in ice and large-scale piracy. http://www.ocimf.org/

and Asfura-Heim (2013) also observe that there is very little symmetry between States except in the North Sea, which is covered by the OSPAR Convention and The Offshore Pollution Liability Association Limited (OPOL)[118], where a $250 million fund has been established to pay any damages and cleanup costs. The authors recommend replication of such a system in the Arctic in which producers are required to join an association that both inspects rigs and accumulates a fund to respond to incidents and claims if an incident occurs. They continue that replication of the system with an agreement among producers and an associated government-to-government agreement that confirms the producer arrangement is something that should be done immediately. They note that such a voluntary producer association could also be a ready source of funding for the pre-positioning of response equipment and assets.

The Arctic Council Arctic Offshore Oil and Gas Guidelines (AOOGG) (Arctic Council, 2009) and the most recent addition to the AOOGG, the *Systems Safety Management and Safety Culture Report* (PAME, 2014), based on the findings and recommendations of the Deep Water Horizon and other investigations, provide non-binding, Arctic-specific guidance. The AOOGG discusses both prescriptive and performance-based approaches to regulation and concluded that a system consisting of components of both approaches is probably the most appropriate for Arctic offshore operations.

More robust monitoring and follow-up are needed. The Arctic Environmental Impact Assessment (EIA)[119] and the AOOGG both have relatively weak monitoring and follow-up procedures. The procedures adopted by OSPAR for implementation, monitoring and follow-up [120] (which only currently cover a small section of the Arctic Ocean (Figure 3) would provide better support for sustainable development. Other OSPAR Decisions ,which are binding on Contracting Parties[121], Recommendations and Agreements[122] already provide regional guidance and regulation for part of the Arctic offshore hydrocarbon sector including the disposal of installations, dumping, offshore chemicals, produced water, cuttings piles, and drilling fluids. Adjusting the spatial scope of the OSPAR Convention to cover the entire Arctic Ocean is an option discussed by Koivurova *et al*., (2009). Nothing in the OSPAR Convention would prevent such an adjustment and they propose that it may be warranted if a similar adjustment was made to the spatial scope of the NEAFC Convention resulting in a 100% overlap of jurisdiction. They conclude that this option would have the advantage of subjecting the entire Arctic Ocean to the OSPAR Commission's competence on cross-sectoral issues and sectoral activities that are not yet subject to the competence of other regional and global bodies. However they warn that the shortcomings of the OSPAR Convention and the OSPAR Commission would also be transposed to the Arctic Ocean. They suggest that the problem is more whether the U.S., Canada and Russian Federation would be willing to become bound by the OSPAR Convention, legally binding decisions, non-legally binding recommendations and other agreements adopted by the OSPAR Commission.

[118] http://www.opol.org.uk/
[119] http://ceq.hss.doe.gov/nepa/eiaguide.pdf
[120] OSPAR Convention 1992, Preamble, Sept. 22, 1992. Examples of OSPAR's regulation of the offshore industry include: OSPAR Decision 2000/3 regulating the use and discharge pf organic-phase drilling fluids and oil based fluids, including monitoring and reporting requirements. OSPAR Recommendation 2001/1 regulating the management of produced water discharge and again provides for monitoring and follow-up procedures.
[121] Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom, together with the European Union.
[122] http://www.ospar.org/content/content.asp?menu=00040400000000_000000_000000

The 2013 Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic[123] (Arctic EPPR), negotiated under the auspices of the Arctic Council, provides a framework for cooperation across the Arctic. The focus of the agreement is firmly on response rather than prevention. Implementation is, of course, subject to the availability of resources. A number of bilateral and multilateral contingency plans are already in place that will guide or address coordination and cooperation in oil spill response operations. All of the parties to the Arctic EPPR agreement were already signatories to the IMO 1990 Convention on Oil Pollution Preparedness and Response (OPRC). The Arctic EPPR reiterates the obligations OPRC - but does not create any new or strengthened ones. Furthermore, neither agreement contains minimum requirements for positioning and deployment of equipment and personnel.

The effectiveness of a top-down approach to regulation of hydrocarbon activities, similar to that emerging in the form of the IMO Polar Code for shipping is debateable. The range of conflicting interests[124] and the widely varying conditions in the Arctic Ocean would likely lead to a lengthy consensus-appeasing process resulting eventually in inadequate regulation. Rather, strengthening and developing the existing governance framework could provide an alternative. The role of the Arctic Council as policy-shaping entity is important in this approach. Industry also has an important role to play in the collaborative development of hydrocarbon policy and of identifying and promoting 'best practices'. In this vein Ebinger *et al*., (2014) propose that, rather than a pan-Arctic approach harmonized regional or bilateral agreements would be able to accommodate local conditions. These would take account of types of resources, extent of infrastructure, ecosystems, and indigenous populations. Building on existing lower-level dialogues, such an approach would also offer "*a more streamlined path*" to finding short-term solutions as it would not, at least initially, involve multiple sovereign actors. An example of such a process is the Russian-Norwegian Barents 2020 Project[125]. Established initially to assess and harmonise the standards needed for safeguarding people, environment and asset values in the Barents Sea, it was later recognised that the results of the project are useful in a pan-arctic perspective, and the project has become an international joint industry project, with broader participation.

Two Arctic Council reports address improvements in safety and oil spill prevention in the offshore hydrocarbon industry. The opportunities identified by the Arctic Ocean Review (PAME, 2013) for improving safety in the petroleum industry include:

- Support efforts in the International Organization for Standardization[126] (ISO) and other processes to develop standards relevant to Arctic oil and gas operations.
- Move toward circumpolar policy harmonization in discrete sectors, for example, environmental monitoring and based on existing studies such as the Arctic Council's AOOGG and the EPPR Recommended Prevention Practices report.
- Promote interactions with the appropriate international treaty bodies on offshore oil and gas issues that address for example discharges, oil spill preparedness and response, and environmental monitoring. Such interactions could include coordinating information exchange on reporting, monitoring, assessment and/or other requirements under relevant entities, encouraging inclusion of science and traditional

[123] http://www.arctic-council.org/eppr/agreement-on-cooperation-on-marine-oil-pollution-preparedness-and-response-in-the-arctic/
[124] Byers and Stoller (2013) discuss the motivations of the negotiating states to the Arctic Oil Spill Prevention Agreement.
[125] http://www.dnv.com/industry/oil_gas/publications/updates/arctic_update/2012/01_2012/barents2020.asp
[126] http://www.iso.org/iso/home.html

knowledge, and keeping abreast of Arctic-specific developments relevant to the appropriate instruments.
- Arctic states should further engage industry and regulator involvement in PAME and EPPR initiatives on offshore oil and gas activity by utilizing existing industry forums or by convening an Arctic-specific oil and gas dialog for industry and contractor groups.

A further recommendation on pollution urges Arctic Sates to continue to monitor and assess combined effects of multiple stressors including offshore oil and gas exploration and extraction.

The Summary Report and Recommendations on the prevention of Marine Oil Pollution in the Arctic (RP3) (Rossi, 2013) from the Arctic Council EPPR Working Group, recommends the following prevention initiatives:

- Improvements to hazardous ice detection, forecasting and monitoring
- Fostering the harmonization of specifications and practices
- Identification by the Arctic Council of common elements and environmental differences, as well as methodologies for undertaking environmental risk assessments in the Arctic, and, if appropriate, a circumpolar marine environment risk assessment
- Facilitate oil spill prevention research and regulatory cooperation
- Ensure appropriate infrastructure is in place for emerging Arctic shipping lanes

Arctic Council's Task Force on Arctic Marine Oil Pollution Prevention (TFOPP) is charged with developing an "Arctic Council Action Plan for Oil Pollution Prevention", while maintaining a balanced approach to economic and social development as well as protection of the fragile Arctic environment. It is anticipated that the efforts of the TFOPP will be guided by the work of other Arctic Council Task Forces including those of the Summary Report and Recommendations on the Prevention of Marine Oil Pollution in the Arctic (RP3) outlined above. The primary objectives of the TFOPP are to identify how best the Arctic Council can contribute to marine oil pollution prevention in the Arctic, to recommend a concrete plan of action, which is anticipated will be presented at the next Arctic Council Ministerial meeting in 2015, and to develop cooperative arrangements to implement the Action Plan. The following questions are being addressed by TFOPP:

- What kinds of measures and actions would further oil pollution prevention in the Arctic
- Which of these measures can be advanced by the Arctic Council
- How Arctic States could accomplish these measures and actions (e.g., what would be needed for each Arctic State to take such measures)

The TFOPP is tasked with developing an Arctic Council Action Plan for Oil Pollution Prevention which should describe in detail:

- Recommended measures and actions to further oil pollution prevention in the Arctic
- A step-by-step plan for implementing these recommendations

Byers and Stoller (2013) urge that an Arctic Oil Spill Prevention Agreement must be negotiated soon, before economic interests become more deeply vested. They suggest that the limitations of the existing oil spill agreements are due to the various underlying motivations of the negotiating states. They warn that the negotiators of the present

agreement should not bow to industry pressures and recommend that any oil spill prevention treaty should require states to raise or remove liability caps which are a form of public subsidy to the oil industry. The underlying reasoning being, that potential costs above the limits are not factored into insurance costs and therefore not into any assessment of economic viability of a potential project. Such a treaty should also require that companies must be capable of drilling a "relief well" to stop the flow of oil in the event of a blowout - during the same drilling season, before the return of winter darkness and sea ice.

## 6.4 Gaps and limitations in Arctic Ocean regulatory system

This section has provided an overview of the existing governance framework for the ACCESS project sectors of Arctic Ocean marine transport and tourism, fishing and aquaculture and the hydrocarbon sector. Table 3 provides a summary of the main gaps and limitations in the existing regulatory system.

**Table 3.** The main gaps and limitations in the existing Arctic Ocean regulatory system

| SECTOR | MAIN GAPS AND LIMITATIONS |
|---|---|
| **Marine transport** | No binding IMO standards relating, for example, to ballast water exchange, antifouling or emissions in the Arctic Ocean |
| | No ships' routing system |
| | No legally binding Arctic Construction, Design, Equipment and Manning (CDEM) standards including any covering fuel content, anti-fouling and ballast water treatment standards |
| | No mandatory insurance requirements for Arctic shipping |
| | International liability and compensation regime is fragmented and limited. Separate conventions address pollution from tankers, bunker fuel from non-tankers, and hazardous and noxious substances from all ships |
| | No convention or protocol addresses damage to the high seas beyond national jurisdiction |
| | Difficult for coastal states to enforce stringent safety standards against vessels not flying their flag |
| | IMO guidelines for ships operating in Arctic ice-covered waters do not apply to fishing vessels, military vessels, pleasure yachts or smaller cargo ships |
| | No mechanism for monitoring, inspection, enforcement of regulations across the Arctic Ocean |
| **Arctic Marine Tourism** | No binding regulations relating to tourism in the marine Arctic |

| | |
|---|---|
| **Fishing** | Other than NEAFC there are no RFMOs covering the high seas in the Arctic Ocean |
| | UNFSA only applies to straddling and highly migratory fish stocks |
| | Coastal state regulations are not harmonized and may be inadequate |
| | Translation of international law into national legislation by Arctic Ocean coastal states and other states with regard to their roles as flag states, port states, market states, natural or juridical persons[2] may not be adequate |
| | Insufficient knowledge of Arctic Ocean ecosystems and the impacts of climate change to ensure application ecosystem-based management approach |
| **Aquaculture** | Limited understanding of impacts of climate change on aquaculture make it difficult to develop ecosystem-based legislation |
| | Differing and non-harmonized regulatory regimes |
| **Oil and gas** | Current regulatory regime varies between states and is fragmented |
| | Regulation relies on coastal states to implement, monitor and enforce |
| | No convention addresses liability and compensation arising from offshore oil rigs, pipelines and production systems |
| **General** | Gaps in navigational aids, charts, infrastructure, as well as search and rescue and cleanup capacity |
| | National standards for holding individuals financially accountable for pollution incidents vary widely between states. The possibility to legally limit liability by carrying only enough insurance to meet minimum statutory liability limits – which may be inadequate |
| | Liability difficult to establish in incidents with trans-boundary impacts |

For all the sectors above transboundary, ecosystem-based approaches to governance are the ideal with standardised / harmonised regulations – in particular for transboundary resources, living and non-living, as well as other activities. For this to succeed there needs to be a commitment at a national level. Marine spatial planning offers one method through which this can be approached.

While policy / governance decisions need to be agreed on by most (if not all) parties to ensure compliance this should not result in acceptance of the lowest standards. Ad hoc regional or bilateral agreements may offer a more efficient path to solutions than legislatively cumbersome treaties.

**Section Summary**

- Complex mosaic of policies, measures and regulations spanning various levels, institutions and states with varying degrees of maturity
- Few instruments specifically for Arctic conditions

- Lack of harmonisation of regulations in all sectors
- Need for more robust implementation, monitoring and follow-up
- 'Top-down' is not necessarily the best approach to governance
- Need to identify and implement 'best practice'
- Transboundary, ecosystem-based approaches to governance are the ideal with standardised / harmonised regulations
- While policy / governance decisions need to be agreed on by most (if not all) parties to ensure compliance this should not result in acceptance of the lowest standards
- Ad hoc regional or bilateral agreements may offer a more efficient path to solutions than legislatively cumbersome treaties

# 7. GOVERNANCE SPECTRUM

ACCESS Report D5.21, "*Current governance options for ACCESS sectors/themes*", examined how the current instruments, agreements and codes were working in practice, and in the context of the long-term (thirty years) period of ACCESS. Four potential governance 'action options' were identified as well as a fifth, non-action, option. These comprised: (A) the establishment of a single over-arching instrument, an Arctic Treaty, similar to that existing for the other polar context, the Antarctic Treaty; (B) the strengthening and augmenting of the powers of the Arctic Council to encourage this regional body to establish binding legislation over the Arctic Ocean; (C) the modification, enhancement and amendment of existing regulations and instruments to create a range of standardised regulations; (D) the specific targeting of areas of the regulations which do exist where chronic failure is predicted due to the effects of climate change and (E) retain the status quo and maintain without revision the existing complex and diverse panoply of regulatory systems.

These options fitted within a spectrum of governance (Figure 6) extending between the extremes of "fully integrated" and "fully fragmented", corresponding to a level of intervention from option (A) to option (E), above, respectively.

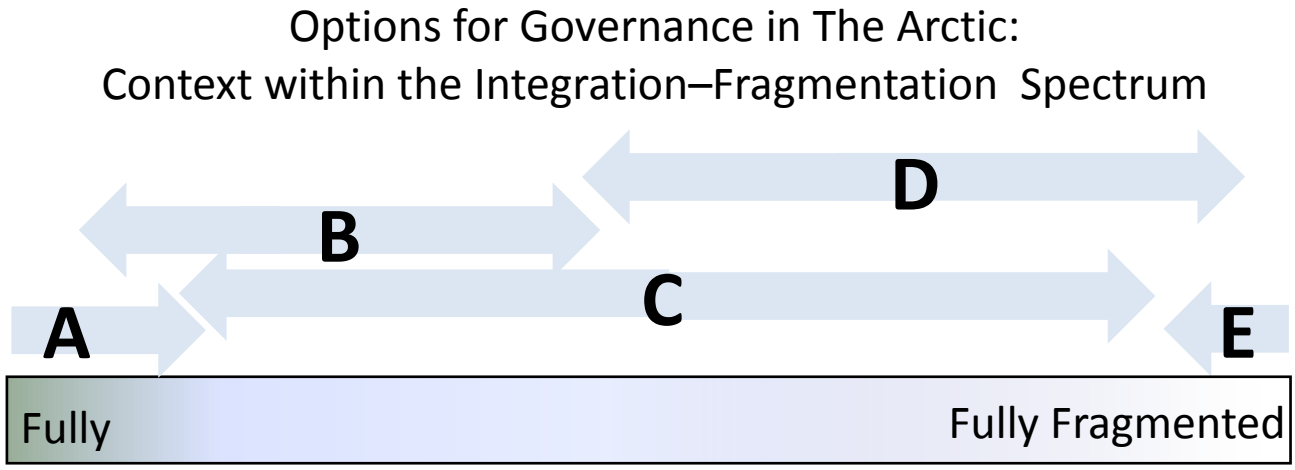



**Figure 6.** Integration-Fragmentation Spectrum[127] indicating the position of the current governance options

[127] Integration-fragmentation spectrum: a concept developed by Keohane and Victor (2011) in relation to the regime complex for climate change. The spectrum comprises a continuum of international

Following the report's review of current thinking and commentary, the authors of ACCESS Report D5.21 deduced that a most pragmatic and actionable scenario would be the pursuit of a 'middle ground' of prescription and guidance to expand and strengthen existing instruments and agreements. In effect, this is what is occurring, almost by default. Such a hybrid system would be positioned somewhere in the middle of an 'integration-fragmentation spectrum' (Figure 7). Expanding and strengthening existing instruments and agreements avoids the need to develop entirely new arrangements, which would potentially involve lengthy negotiations, by building on the existing governance frameworks.

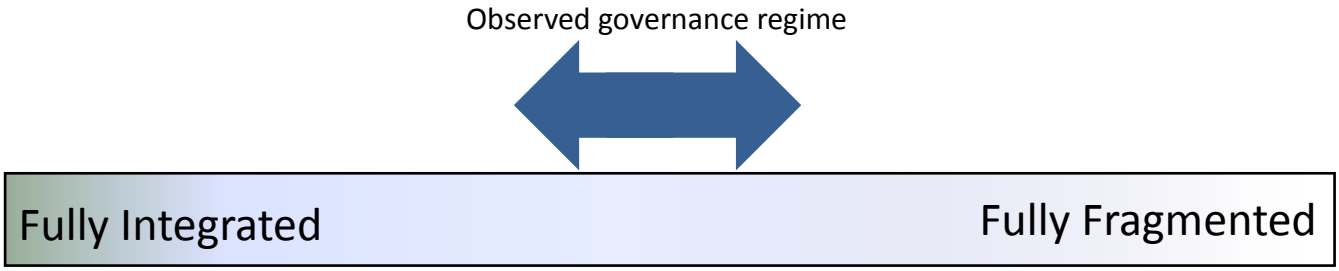



**Figure 7.** Integration-fragmentation spectrum showing position of observed hybrid governance regimes

The conclusion that expanding and strengthening existing instruments and agreements is the best approach to governance in the Arctic raises clear questions as to how this might best be achieved:

i) How can better coordination amongst the current sectoral and regional approaches be achieved to address future governance needs?

ii) Will better coordination among these approaches will be adequate to meet these needs?

iii) Is a more comprehensive, top down approach required?

The latter question has in some way already been answered by the clear opposition shown by Arctic coastal States to any international comprehensive, stand-alone, binding Arctic legal governance arrangement[128].

Identification and analysis of the existing and emerging governance landscape for the Arctic Ocean has allowed ACCESS to consider the implications for governance of changing environmental, social and economic conditions and high uncertainty in this region. These

regulatory instruments, at one end a single integrated legal instrument, at the other, highly fragmented arrangements and in between these extremes lies a range of regimes and regime complexes.

[128]Illulissat Declaration, Arctic Ocean Conference, 28th May 2008. The Declaration, issued by the five Arctic Ocean coastal States, asserts that *"(B)y virtue of their sovereignty, sovereign rights and jurisdiction in large areas of the Arctic Ocean the five coastal states are in a unique position to address*" the emerging "*possibilities and challenges*" in the Arctic Ocean. Furthermore, the signatories consider that the Law of the Sea "*framework provides a solid foundation for responsible management by the five coastal states and other users of the Ocean* ..."and "*see no need to develop a new comprehensive international legal regime to govern the Arctic Ocean*".

are summarised in Section 10 of this report, Key Findings. This work can provide a foundation for the ongoing analysis of Arctic Ocean governance and, in addition, provide a potential template for such work in regions of similar of high uncertainty and rapid change.

**Section Summary**

- 'Middle ground' approach provides best option for governance – expanding and strengthening existing instruments and agreements

# 8. FUTURE GOVERNANCE

Future governance will obviously benefit from improved coordination across the Arctic states. However, serious limitations exist in the existing instruments and regimes which need to be addressed.

A significant limitation within the current governance regime is that international conventions that apply to the Arctic are generally not specific to the Arctic (or Polar Regions) and fail to take into consideration of the uniquely harsh conditions found there. Until recently the only international Arctic-specific agreement was the 1973 Agreement on the Conservation of Polar Bears[129]. This shortfall is being addressed, at least insofar as shipping is concerned, by the development by the International Maritime Organization (IMO) of a mandatory International Code of safety for ships operating in polar waters (mandatory Polar Code). However, even after implementation of the mandatory Code regulatory gaps will remain (Section 6.1.1.2).

The two legally binding agreements made under the auspices of the Arctic Council (the Arctic SAR and the Arctic Oil Spill Response Agreement) indicate a possible route for future binding regulations that take into account the conditions in the Arctic. However, despite the potential for improved coordination offered via the Arctic Council concerns over the 'weakness' of the Arctic Oil Spill Response Agreement[130] raise the question of how robust such legislation needs to be and what are the influences driving the negotiation of such instruments[131].

A further significant issue is that not all Arctic states are parties to important treaties, the most obvious example of which is the U.S. non-ratification of the UNCLOS[132] and the

[129] http://pbsg.npolar.no/en/agreements/agreement1973.html

[130] European Parliament resolution 2014 on the EU strategy for the Arctic (2013/2595(RSP) "*considers it regrettable" … "that the agreement does not include specific binding common standards*". Byers and Stoller (2013) (http://www.arcticinfo.eu/en/features-what-small-teeth-you-have) describe the Agreement as "weak and incomplete" but note that it may provide a useful indicator of how the negotiation of an Arctic Oil Spill Prevention Agreement may be influenced by the intersection of priorities.

[131] Greenpeace expressed concerns about the agreement. These include the vague language used such as "*appropriate response*" and major omissions including any discussion of oil company liabilities or effective arrangements in the event of a transboundary incident. The role of oil companies in drafting the agreement was also questioned.
http://www.greenpeace.org/international/en/press/releases/Leaked-Arctic-Council-oil-spill-response-agreement-vague-and-inadequate---Greenpeace/

[132] In May 2014 President Obama urged the senate to ratify UNCLOS. Since it was opened for signature in 1982 several U.S. presidents have sought the consent of the Senate - without success. Although the treaty has the support of diverse groups representing including the U.S. Navy and Coast

Biodiversity Convention (CBD). Nevertheless the U.S. considers that it acknowledges its responsibilities and enjoys its rights in the Arctic marine environment as part of its adherence to customary law.

## 8.1. 'Soft law' or 'hard law' approach?

While coordination and harmonization across the Arctic Ocean is important for successful future governance, the need for legislation to keep pace with the rapid changes in the region should not be ignored.

There is not a well established record of international cooperation across the Arctic. In such a situation 'soft law' can be useful, as it requires neither formal ratification procedures nor the passage of domestic implementing legislation. Both processes can be time consuming and political constraints may make them difficult to achieve. Making treaties may also involve serious constitutional or legislative barriers. Conversely, the negotiation of soft law instruments will usually be quicker and provisions contained within such agreements can take effect immediately (Nowlan, 2001). Furthermore, treaties may produce weaker commitments than a soft law regime. As soft law agreements are not legally binding, states may be more willing to include substantive commitments and governments may also be more willing to take innovative approaches (*ibid.).* Another benefit of a soft-law approach in the Arctic where rapid changes are underway is that it can be quickly adapted to rapidly changing circumstances.

"Soft law" approaches may include: harmonization of environmental and technical standards by coastal states in key sectors such as shipping, fishing, and hydrocarbon exploration/exploitation; development of integrated ocean planning initiatives for transboundary marine ecosystems, for example, the Barents, Beaufort, and Bering Seas and restructuring the Arctic Council, including by broadening participation (Koivurova *et al*., 2009).

Hard law approaches that have been proposed include negotiating a regional seas agreement with protocols (for example de la Fayette, 2008; Koivurova and Molenaar, 2009); establishing a new regional ocean management organization for governing areas beyond national jurisdiction; transforming the Arctic Council into a treaty-based organization and forging sectoral agreements for particular priorities such as search and rescue and joint marine contingency planning (*ibid*.).

**Section Summary**

- Treaties may produce weaker commitments than a soft law regime. . As soft law agreements are not legally binding, states may be more willing to include substantive commitments and governments may also be more willing to take innovative approaches
- 'Soft law' approach may be more flexible and easy to negotiate and therefore better suited to rapidly changing environment

Guard, international environmental groups, and the mining, fishing, shipping, and telecommunications industries, a minority of conservatives strongly oppose the treaty believing it to be a threat to U.S. sovereignty. If ratification is approved it will potentially clearing the way for U.S. oil and mining companies to operate in the Arctic Ocean.

# 9. THE MAIN EXISTING PROPOSALS FOR ARCTIC GOVERNANCE

A number of NGOs and Arctic commentators have proposed governance options for the Arctic Ocean ranging from calls for a single overarching treaty to recommendations for specific activities in the marine environment. de La Fayette (2008); Koivurova *et al.,* (2009) and the WWF (Koivurova and Molenaar, 2010) discuss the development of a new, legally binding Arctic Ocean Framework Convention. This approach appears, at least for the present, to have fallen from favour, possibly due to the opposition from the five Arctic Ocean coastal states (see above).

The Arctic Governance Project (AGP)[133] was also of the opinion that there was "… *no need to negotiate a single comprehensive agreement, much less a legally binding treaty* "citing profound political obstacles, length of time to achieve and inflexibility as deterrents, asserting that "*the existing capacity to address matters of governance in the Arctic is substantial*" (Arctic Governance Project, 2010). The AGP offered policy makers a number of recommendations for consideration when contemplating Arctic governance (*ibid.):*

- Honouring, implementing, and enhancing existing Arctic governance systems
- Strengthening the Arctic Council
- Establishing regulatory mechanisms to address proactively key functional and sectoral issues through appropriate international bodies
- Institutionalizing the science/policy interface in the Arctic
- Creating Arctic stakeholder forums or roundtables to build trust and stimulating dialogue on Arctic issues

Two reports commissioned by The Pew Charitable Trusts [134] focus on a specific activity, oil and gas, and contain policy recommendations for oil spill prevention and response in the U.S. Arctic Ocean (Pew Environment Group, 2010; Pew Charitable Trusts, 2013). The reports include extensive proposals and recommendations including the reform of the U.S. federal government's approval and oversight of Arctic Ocean oil and gas activities; that Arctic Outer Continental Shelf (OCS) standards for oil spill response should take into account the Arctic's remote location, lack of infrastructure, challenging operating conditions, realistic planning for a worst-case spill and inclusion of traditional knowledge in research. Recommendations also call for identification and protection of ecologically sensitive areas, improved technology, equipment, and procedural requirements that match the challenging conditions in the Arctic and full public participation and transparency throughout the decision-making process. It is also pointed out that a balance needs to be achieved between responsible energy development and protection of the environment and recommends updating regulations to include Arctic-specific requirements and codifying temporary guidance into regulation. The Pew recommendations address many gaps in the 2013 Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic[135].

[133] http://www.arcticgovernance.org/

[134] http://www.pewtrusts.org/en

[135] http://www.arctic-council.org/eppr/agreement-on-cooperation-on-marine-oil-pollution-preparedness-and-response-in-the-arctic/

**Section Summary**
- A single pan-Arctic treaty is unlikely
- Best option seems to be implementing and strengthening existing governance, including strengthening the Arctic Council

# 10. KEY FINDINGS

## 10.1. General

High levels of uncertainty are associated with the environmental and social changes underway in the Arctic. To be able to respond within appropriate time scales governance mechanisms must be adaptive and any new instruments or amendments to existing instruments need to be relatively quick to put in place as ponderous and protracted policy making risks being out-of-date before it is implemented. (Section1: Introduction)

The existing range of approaches to environmental governance from formal to informal ad hoc cooperation offer possible responses to rapid changes (Section 4: Environmental Governance)

A single pan-Arctic Treaty, similar to the Antarctic Treaty, now seems unlikely. Our observations suggest that no single approach is emerging but rather a range of approaches from formal, legally binding (e.g. the new Polar Code) to ad hoc, local, non-standardised arrangements. (Section 7: Governance Spectrum)

While policy / governance decisions need to be agreed on by most (if not all) parties to ensure compliance this should not result in acceptance of the lowest standards. Ad hoc regional or bilateral agreements may offer a more efficient path to solutions than legislatively cumbersome treaties. (Section 6.4: Gaps and limitations in Arctic Ocean regulatory system)

Treaties may produce weaker commitments than a soft law regime. As soft law agreements are not legally binding, states may be more willing to include substantive commitments and governments may also be more willing to take innovative approaches. A ‘soft law’ approach, which potentially take less time to develop and is more likely to be adhered to, may be better suited to a rapidly changing environment. (Section 8.1: ‘Soft law’ or ‘hard law’ approach?)

Increasing interest and activity in the Arctic from non-Arctic States makes a broader dialogue essential. Arctic Council needs to retain dialogue with non-Arctic States since in particular international law requires this for High seas fisheries and seabed ABNJ. (Section 2.2.1: Role of the Arctic Council)

Transboundary, ecosystem-based approaches to governance are essential. Standardisation / harmonisation of regulations is an ideal – in particular for transboundary resources, living

and non-living, as well as other activities. For this to succeed there needs to be a commitment at a national level. Marine spatial planning offers one method through which this can be approached. (Section 6: Climate Change and Governance)

The changing environmental, economic, social and policy landscapes in the Arctic make it essential that governance arrangements are regularly monitored to gauge how changes in governance may affect / are affecting Arctic users / stakeholders /regional bodies / indigenous peoples (Section 5: Governance Indicators)

## 10.2 Indigenous peoples

Processes need to be established or strengthened to ensure meaningful consultation with stakeholders, including indigenous peoples and user groups during development or revision of policy instruments. (Section 3: Indigenous Peoples)

Participation of indigenous peoples in knowledge sharing and decision making processes should in particular be ensured by adequate access to means of communication. (Section 3: Indigenous Peoples)

National and industry interests should not be allowed to take precedence over those of the environment and indigenous and local populations and the policy-making process in the Arctic should incorporate traditional knowledge. (Section 8: Future Governance and Section 3: Indigenous Peoples)

## 10.3 Main governance gaps to be addressed in the sectors

**Cross-sectoral**

Need development/strengthening of legislation relating to underwater noise in the Arctic. (Section 4.1: Ocean Noise)

**Shipping**

Gaps in the mandatory Polar Code need to be addressed: invasive species (ballast water/hull-fouling), noise and air pollution – including black carbon. (Section 6.1.1.2: Existing and developing governance options for Arctic shipping)

There is a need for a mandatory regime to be developed for insurance to cover vessels operating in the Arctic Ocean. Such a regime should ensure that all ships carry adequate levels of insurance which take account of the difficult operating and recovery conditions in the arctic. Such a regime also should ensure that ship owners are not able to evade responsibility. (Section 6.1.1.2: Existing and developing governance options for Arctic shipping)

Regulation of tourist activities in the Arctic, and associated infrastructure, requires urgent action. The existing voluntary guidelines will need to be carefully integrated with the Polar

Code and other regulatory developments to maintain a coherent regulatory framework. (Section 6.1.2.2: Existing and developing governance options for Arctic marine tourism)

**Fisheries and aquaculture**

Limited understanding of impacts of climate change on aquaculture makes it difficult to develop ecosystem-based legislation. (Section 6.2.2.1: Impacts of climate change on aquaculture in the Arctic)

Aquaculture legislation, operating standards and practices, particularly on hygiene and pathogen transfer, should be coordinated across borders to limit the risk of disease transfer and development. (Section 6.2.2.2: Existing and developing governance options for aquaculture)

**Oil and gas**

There is a need to develop of a fund for compensation in the event of pollution from hydrocarbon activities. (Section 6.3.2: Existing and developing governance options for oil and gas activities in the Arctic Ocean)

There is a need to develop legislation relating to damage from oil pollution in the high seas. (Section 6.3.2: Existing and developing governance options for oil and gas activities in the Arctic Ocean)

Regulations relating to Arctic offshore oil and gas activities need to be strengthened and harmonized while taking into account differences in local conditions in terms of type of resource, infrastructure in place, local and indigenous communities. (Section 6.3.2: Existing and developing governance options for oil and gas activities in the Arctic Ocean)

# REFERENCES

ACCESS Report D3.11. Economic impacts of global warming on fisheries

ACCESS Report D3.21. Climate change and Arctic aquaculture

ACCESS Report D4.42. Assessment of the behaviour of different types of oil and gas products in a cold water environment based on experiments and modelling

ACCESS Report D4.51 Interactive noise maps of exploration / exploitation sites

ACCESS Report D4.52 Simulator of the effects of noise from oil industry operations on marine mammals

ACCESS Report D4.61. Internal report covering governance observations and options: oil and gas exploitation

ACCESS Report D5.11. Analysis and synthesis of extant and developing regulatory frameworks

ACCESS Report D5.21. Current governance options for ACCESS sectors/themes

ACCESS Report D5.31. Assessment of inputs regarding climate change effects and impacts on extant regulatory systems and overview and review of predicted stress on these systems

ACCESS Report D5.61 Operational conditions of Arctic indigenous peoples' effective participation in Arctic governance

ACIA. 2004. Impacts of a warming climate: Arctic Climate Impact Assessment. Cambridge University Press

ACIA. 2005a. Fisheries and Aquaculture. Ch. 13 in Arctic Climate Impact Assessment Scientific Report. Cambridge University Press, pp 691-780. Available at http://www.acia.uaf.edu/pages/scientific.html. Last accessed 28 October 2014

ACIA. 2005b. The Changing Arctic: Indigenous Perspectives. Ch. 3 in Arctic Climate Impact Assessment Scientific Report. Cambridge University Press, pp 61-98.. Available at http://www.acia.uaf.edu/pages/scientific.html. Last accessed 28 October 2014

AMSA. 2009. Arctic Marine Shipping Assessment 2009 Report. Arctic Council, April, 2009

Arctic Council. 1998. Field Guide for Oil Spill Response in Arctic Waters. EPPR Programme of the Arctic Council. Available at: http://arctic-council.org/eppr/wp-content/uploads/2010/04/fldguide.pdf

Arctic Council. 2006. Sustainable Model for Sustainable Arctic Regional Tourism. Published by the State Provincial Office of Lapland and Kemi-Tornio University of Applied Sciences. Available at http://www.sdwg.org/media.php?mid=434. Last accessed 14 August 2014

Arctic Council. 2009. Arctic Offshore Oil and Gas Guidelines. Available at : http://www.pame.is/images/03_Projects/Offshore_Oil_and_Gas/Offshore_Oil_and_Gas/Arctic-Guidelines-2009-13th-Mar2009.pdf. Last Accessed: 19 August 2014

Arctic Council. 2013. Arctic Ocean Review Project 2009-2013, Final Report, Phase II 2011-2013. 8th Arctic Council Ministerial Meeting, Kiruna, Sweden, 15th of May 2013

Arctic Governance Project. 2010. Arctic Governance in an Era of Transformative Change: Critical Questions, Governance Principles, Ways Forward Report of the Arctic Governance Project. Available at: http://www.arcticgovernance.org/

Barents Regional Council. 2013. Barents Programme 2014-2018. Available at: http://www.beac.st/news/Barents-Programme-2014-2018-available-/2w1gsl2r/e59501ec-fb2c-4244-8352-de8ca17cd556. Last accessed 3 November 2014

Barry-Pheby, E. A. 2013. The Growth of Environmental Justice and Environmental Protection in International Law: In the Context of Regulation of the Arctic's Offshore Oil Industry. Sustainable Development Law & Policy 13.1:11

Berkman, P.A. and Vylegzhanin, A.N. 2013. Conclusions: Building Common Interests in the Arctic Ocean. IN: Berkman, P.A. and Vylegzhanin, A.N. (eds.). Environmental Security in the Arctic Ocean. Springer, Dordrecht. Pp. 371-404.

Breitmeier, H., Young, O. R. and Zürn, M. 2006, Analyzing International Environmental Regimes from Case Study to Database, MIT Press, Cambridge, pp. 337

Breitmeier, H., Underdal, A., Young, O. R. 2011. The Effectiveness of International Environmental Regimes: Comparing and Contrasting Findings from Quantitative Research. International Studies Review, 13, 579–605

Brigham, L. 2010. Think again: The Arctic. Foreign Policy, Sept / Oct 2010. Available at: http://www.foreignpolicy.com/articles/2010/08/16/think_again_the_arctic

Burris, A. 2014. Ice regime for Arctic shipping risks welcomed. Insuranceday, 18:03, 9 December 2014

Byers, M. And Stoller, M. 2013. What small teeth you have. **Arctic oil spill response agreement weakened by conflicting interests. Strategic Environmental Impact Assessment of Development of the Arctic. Available at:** http://arcticinfo.eu/en/features/76-what-small-teeth-you-have**. Last accessed 11 August 2014**

**Chapin, S. and Hamilton, N. 2009. Policy Options for Arctic Environmental Governance. Arctic TRASNFORM Environmental Governance Working Group. Available at:** http://arctic-transform.org/download/EnvEX.pdf**. Last accessed 7 January 2015**

**Cameron, E. S. 2012. Securing Indigenous politics: A critique of the vulnerability and adaptation approach to the human dimensions of climate change in the Canadian Arctic. Global Environmental Change, 22: 103-114**

Cheung, W. W. L., Lam, V. W. Y., Sarmiento, J. L., Kearney, K., Watson, R., Pauly, D. (2009) Projecting global marine biodiversity impacts under climate change scenarios. Fish and Fisheries, 10, 235–251

de La Fayette, L. A. 2008. Oceans governance in the Arctic. The International Journal of Marine and Coastal Law, 23 (3). pp. 531-566

Ebinger, C., Banks, J. P., Schackmann, A. 2014. Offshore Oil and Gas Governance in the Arctic: *A Leadership Role for the U.S.* March 2014. Policy Brief 14-01. The Brookings Institute

Ehler, C. (2003) Indicators to measure governance performance in integrated coastal management. Ocean & Coastal Management 46 (2003) 335–345.

Eide, A. 2007. Economic impacts of global warming – the case of the Barents Sea fisheries. Natural Resource Modeling, 20(2): 199-221

European Commission. 2007. Communication from the Commission to the European Parliament, The Council, the European Economic and Social Committee and the Committee of the Regions: An Integrated Maritime Policy for the European Union, 10 October, COM (2007)575 final

European Commission. 2008. Communication from the Commission to the European Parliament and the Council: The European Union and the Arctic Region, 20 Nov 2008, COM (2008) 763

European Commission and the High Representative. 2012. Joint Communication to the European Parliament and the Council. Developing a European Union Policy toward the Arctic Region: progress since 2008 and next steps. European Commission and High Representative of the European Union for Foreign Affairs and Security Policy, 26 June 2012, JOIN (2012) 19 final

European Parliament. 2008. European Parliament resolution of 9 October 2008 on Arctic governance. P6_TA(2008)0474

Eurostat. 2011, Sustainable Development in the European Union: 2011 monitoring report of the EU sustainable development strategy, European Union, Luxembourg, pp. 377

FAO. 2001. International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing. Food and Agriculture Organisation of the United Nations, Rome, pp 24

FAO (2010). The state of world fisheries and aquaculture. FAO Fisheries and Aquaculture, FAO, Rome.

Fenge, T. & Funston, B. W. 2009. Arctic Governance: Traditional Knowledge of Arctic Indigenous Peoples from an International Policy Perspective. Available at: http://www.arcticgovernance.org/arctic-governance-traditional-knowledge-of-arctic-indigenous-peoples-from-an-international-policy-perspective.4667262-142902.html. Last accessed: 16th July 2014

Gautier D. L., Bird K. J., Charpentier R. R., Grantz A., Houseknecht D. W. et al. Assessment of Undiscovered Oil and Gas in the Arctic. Science, 324,1175. DOI: 10.1126/science.1169467

Hamilton, J. M., Maddison, D. J., Toll, R. S. J. 2005. Effects of climate change on international tourism. Climate Research, Vol. 29: 245–254, 2005
Hoel, A. H. 2014. Perspective: Managing new Central Arctic Ocean fisheries in an era of global warming. Available at: **http://openchannels.org/news/meam/perspective-managing-new-central-arctic-ocean-fisheries-era-global-warming**

Hollowed A.B., Planque B., Loeng H. 2013. Potential movement of fish and shellfish stocks from the sub-Arctic to the Arctic Ocean. Fisheries Oceanography, 22:5, 355-370

Hop, H., Gjøsæter, H. 2013. Polar cod (*Boreogadus saida*) and capelin (*Mallotus villosus*) as key species in marine food webs of the Arctic and the Barents Sea, Marine Biology Research, 9:9, 878-894, DOI:10.1080/17451000.2013.775458

Huntington, H. P. 2011. The local perspective. Nature, 478, 182-183
IOC-UNESCO (2011) Methodology for the GEF Transboundary Waters Assessment Programme. Volume 5. Methodology for the Assessment of Large Marine Ecosystems, UNEP, viii + 115 pp. Available at http://www.unep.org/dewa/Portals/67/pdf/TWAP-Volume-5-Methodology_for_LMEs-low-res.pdf. Last accessed 1 May 2014

IPCC (2014) WGII AR5 Phase I Report. Summary for Policy Makers.
Ingvaldsen R. B. & Gjøsæter H. 2013. Reponses in spatial distribution of Barents Sea capeline to changes in stock size, ocean temperature and ice cover. Marine Biology Research, 9, 867-877

International Chamber of Shipping. 2014. Arctic Shipping: Position Paper. Available at http://www.ics-shipping.org/docs/default-source/resources/policy-tools/ics-position-paper-on-arctic-shipping.pdf?sfvrsn=14. Last accessed 31 October 2014

Keil, K. 2013a. Evaluation of the Arctic Shipping Season 2013. Available at **http://www.thearcticinstitute.org/2014/01/evaluation-of-arctic-shipping-season.html**. Last accessed 31 October 2014

Keil, K. 2013b. The role of arctic hydrocarbons for future energy security. NAPSNet Special Reports, January 07, 2014, http://nautilus.org/napsnet/napsnet-special-reports/the-role-of-arctic-hydrocarbons-for-future-energy-security/

Keohan R. O. and Victor D. G. 2011. The Regime Complex for Climate Change. Perspectives on Politics, Vol. 9/No. 1, pp 7-23. DOI:10.1017/S1537592710004068

Koivurova, T., Molenaar, E. J., Vanderzwagg, D. L. 2009. Canada, the EU, and the Arctic Ocean Governance: a Tangled and Shifting Seascape and Future Directions. Journal of Transnational Law and Policy, 18.2, pp 247-288

Koivurova, T. and Molenaar, E. J. 2010. International governance and the regulation of the marine Arctic: a proposal for a legally binding agreement. Oslo: WWF International Arctic Programme

Krupnik, I., Allison, I., Bell, R., Cutler, P., Hik, D., Lopez-Martínez, J., Rachold, V., Sarukhanian, E., Colin, S. (eds.) 2011. Understanding Earth's Polar Challenges: International Polar Year 2007–2008. Summary by the IPY Joint Committee. Edmonton, Canadian Circumpolar Institute Press

MacInnis, K.A. 2012. The Polluter Pays Principle: Preventing Ship-Source Pollution in the Arctic. In The Regulation of International Shipping: International and Comparative Perspectives. Essays in Honor of Edgar Gold. Eds. A. Chircop; N. Letalik; T. L Dorman; S. J Rolston. Kininklijke Brill, Leiden, The Netherlands. Pp 143- 169

Mahon, R., Flanning, L., McConney, P. 2011. Observations on governance in the Global Environment Facility (GEF) International Waters (IW) Programe. CERMES Technical Report No 45.

Molenaar, E. J. 2009. Arctic Fisheries Conservation and Management: Initial Steps of Reform of the International Legal Framework. Text submitted to Yearbook of Polar Law, March 2009. Available at: http://doc.nprb.org/web/nprb/afs_2009/Molenaar%20Arctic%20Fisheries%20Conservation%20and%20Management%20final%20version%20to%20YPL.pdf. Last accessed 10 August 2014.

Molenaar, E. J. 2014. Status and Reform of International Arctic Shipping Law. Ch. 6, Arctic Marine Governance: Opportunities for Transatlantic Cooperation. Eds. E. Tesden, S. Cavalieri and R. A. Kraemer. Springer-Verlag, Berlin Heidelberg. Pp 127-157

Molenaar, E. J., Koivurova, T., Tedsen, E., Reid, A., Hossain, K. 2014. Introduction to the Arctic. Ch. 1, in Arctic Marine Governance: Opportunities for Transatlantic Cooperation. Eds. E. Tesden, S. Cavalieri and R. A. Kraemer. Springer-Verlag, Berlin Heidelberg

Mueter, F. J., Reist, J. D., Majewski, A. R., Sawatzky, C. D., Christiansen, J. S., Hedges, K.. J. et al. 2013. NOAA Arctic Report Card 2013 Update -Marine Fishes of the Arctic. Available at: ww.arctic.noaa.gov/reportcard/marine_fish.html. Last accessed: 5 February 2014

Nowlan, L. 2001. Arctic Legal Regime for Environmental Protection. IUCN, Gland, Switzerland
and Cambridge, UK and ICEL, Bonn, Germany. xii + 70 pp.

Olsen, S. B., Sutinen, J. G., Juda, L., Hennessey, T. M., Grigalunas, T. A. 2006. A Handbook on Governance and Socioeconomics of Large Marine Ecosystems. University of Rhode Island, USA pp 94

OSPAR. 2000. Regional QSR, Regional, Arctic Waters. Chapter, Geography, Hydrography and Climate. Available at http://www.ospar.org/content/content.asp?menu=00790830300000_000000_000000. Last accessed 27 October 2014

PAME. 2013. The Arctic Ocean Review Project, Final Report, (Phase II 2011-2013), Kiruna May 2013. Protection of the Arctic Marine Environment (PAME) Secretariat, Akureyri

PAME. 2014. Arctic Offshore Oil and Gas Guidelines: Systems Safety Management and Safety Culture. Arctic Council, Protection of the Arctic Marine Environment Working Group. Available at http://www.arctic-council.org/index.php/en/resources/news-and-press/news-archive/874-new-guidelines-from-pame-on-arctic-offshore-oil-and-gas-safety-management. Last accessed 23 July 2014

Pew Environment Group. 2010. Policy Recommendations: Oil Spill Prevention and Response in the U.S. Arctic Ocean. Report prepared by Nuka Research and Planning Group, LLC and Pearson Consulting, LLC. US Arctic Program, Pew Environment Group, pp 19

Pew Environment Group. 2012. Policy Statement: United Nations Ad Hoc Open-ended Informal Working Group to study issues relating to the conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction (BBNJ), pp14

Pew Charitable Trusts. 2013. Arctic Standards: Recommendations on Oil Spill Prevention, Response, and Safety in the U.S. Arctic Ocean. Pew Charitable Trusts, pp 133

Rayfuse, R. 2008. Protecting Marine Biodiversity in Polar Areas Beyond National Jurisdiction. RECIEL 17 (1) 2008. ISSN 0962 8797

Rekacewicz, P. 2012. UNEP/GRID, http://www.grida.no/graphicslib/detail/definitions-of-the-arctic_12ba

Rosen, M. E. and Asfura-Heim, P. 2013. Addressing the Gaps in Arctic Governance. Arctic Security Initiative. Hoover Institution. Available at: http://www.hoover.org/research-teams/arctic-security-working-group. Last accessed 1 December 2014

Rossi, B. 2013. Summary Report and Recommendations on the Prevention of Marine Oil Pollution in the Arctic. Arctic Council, EPPR Working Group. ISBN: 978-82-7971-0077-6. Available at http://www.arctic-council.org/index.php/en/document-archive/category/445-pame. Last accessed 6 November 2014

SCPAR. 2012. Arctic governance in an evolving Arctic region. A Proposal by the Standing Committee of Parliamentarians of the Arctic Region. Available at: http://www.arcticparl.org/files/arctic-governance-in-an-evolving-arctic-region.pdf. Last accessed: 29th July 2014

Stepien, A., Koivurova, T., Gremsperger, A., Niemi, H. 2014. Actic Indigenous Peoples and the Challenge of Climate Change. Ch. 4 in Arctic Marine Governance: Opportunities for Transatlantic Cooperation. Eds. E. Tesden, S. Cavalieri and R. A. Kraemer. Springer-Verlag, Berlin Heidelberg

Stoessel, S., Tedsen, E., Cavalieri, S., Riedel, A. 2014. Environmental governance in the Marine Arctic. In Arctic Marine Governance: Opportunities for Transatlantic Cooperation, Ch. 3. Editors: E. Tedesen, S. Cavalieri and R. A. Kraemer. Springer-Verlag, Berlin Heidelberg, pp 45-69

Toll, R. S. J., Walsh, S. (2012) Climate Change and Tourism in the Arctic Circle. Economics Department Working Paper Series, No. 52-2012. University of Sussex, Brighton, United Kingdom

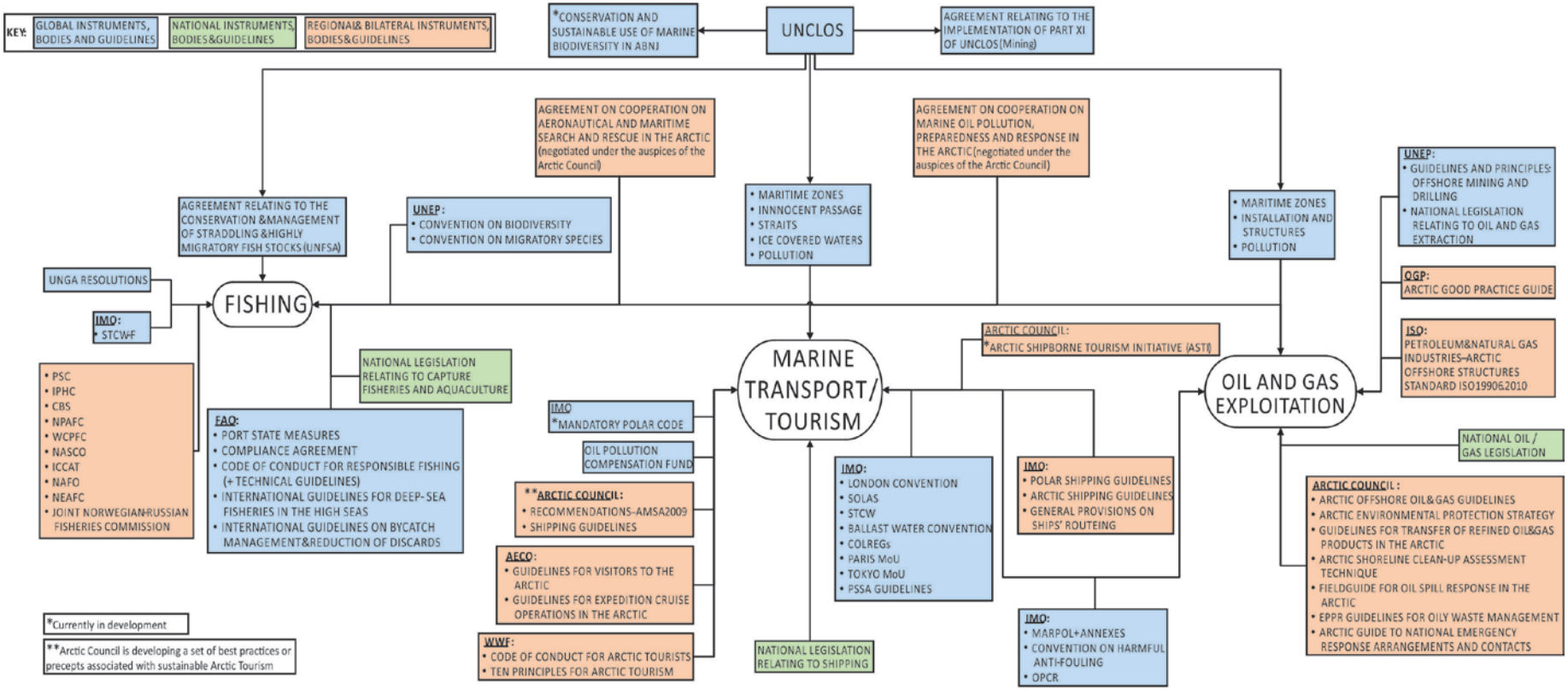
United Nations (2007) Indicators of Sustainable Development: Guidelines and Methodologies. Third Edition. United Nations, pp 93

Young. O. R. 2011. Effectiveness of international environmental regimes: Existing knowledge, cutting-edge themes, and research strategies. *Proceedings of the National*

*Academy of Sciences* 108, 50, 19853–19860. Available at
www.pnas.org/cgi/doi/10.1073/pnas.1111690108

# ANNEX I

## Diagram of regulatory instruments relating to the Arctic Ocean (as of July 2014)



**ANNEX I continued**

**ACRONYMS USED IN GOVERNANCE DIAGRAM:**

| | |
|---|---|
| **AECO:** Association of Arctic Expedition Cruise Operators | **NASCO:** North Atlantic Salmon Conservation Organization |
| **CBS:** Convention on the Conservation & Management of Pollock Resources in the Central Bering Sea | **NEAFC:** North East Atlantic Fisheries Commission |
| **COLREGs:** Convention on the International Regulations for Preventing Collisions at Sea | **NPAFC:** North Pacific Anadromous Fish Commission |
| **FAO:** Food & Agriculture Organization of the United Nations | **OGP:** Oil and Gas Producers |
| **ICCAT:** International Commission for the Conservation of Atlantic Tunas | **OPRC:** International Convention on Oil Pollution Preparedness, Response & Co-operation |
| **IMO:** International Maritime Organization | **PSC:** Pacific Salmon Commission |
| **IPHC:** International Pacific Halibut Commission | **STCW:** International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 |
| **MARPOL:** International Convention for the Prevention of Pollution from Ships | **STCW-F:** International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel, 1995 |
| **MoU:** Memorandum of Understanding | **UNCLOS:** United Nations Convention on the Law of the Sea |
| **NAFO:** Northwest Atlantic Fisheries Organization | **UNEP:** United Nations Environment Programme |
| | **UNGA:** United Nations General Assembly |
| | **WCPFC:** Western & Central Pacific Fisheries Commission |

***The following tables provide links to basic texts on legislation but are not exhaustive***

# ANNEX II REGULATORY INSTRUMENTS RELATING TO SHIPPING AND TOURISM

| Instrument/Agreement | Link to text (where available) / Comments |
|---|---|
| **SUPRANATIONAL** | |
| International Convention for the Prevention of Marine Pollution from Ships, 1973, as amended by the Protocol of 1978 relating thereto (MARPOL 73/78)<br><br>Annex I: Regulations for the Prevention of Pollution by Oil<br>Annex II: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk<br>Annex III: Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form<br>Annex IV: Prevention of Pollution by Sewage from Ships<br>Annex V: Prevention of Pollution by Garbage from Ships<br>Annex VI: Prevention of Air Pollution from Ships | The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes.<br><br>The MARPOL Convention was adopted on 2 November 1973 at IMO. The Protocol of 1978 was adopted in response to a spate of tanker accidents in 1976-1977. As the 1973 MARPOL Convention had not yet entered into force, the 1978 MARPOL Protocol absorbed the earlier Convention. The combined instrument entered into force on 2 October 1983. In 1997, a Protocol was adopted to amend the Convention and a new Annex VI was added which entered into force on 19 May 2005. MARPOL has been updated by amendments through the years[136].<br><br>http://www.imo.org/KnowledgeCentre/ReferencesAndArchives/HistoryofMARPOL/Documents/MARPOL%20-%201978%20Protocol.pdf |
| The Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, London, 1972 (The London Convention)<br><br>1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 29 December 1972 | http://www.imo.org/OurWork/Environment/LCLP/Documents/LC1972.pdf<br><br>http://www.imo.org/OurWork/Environment/LCLP/Documents/PROTOCOLAmended2006.pdf |
| **Revised guidelines for the identification and designation of** | http://www.imo.org/blast/blastDataHelper.asp?data_id=25322&filename=A982%2824%29.pdf |

[136] http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-%28MARPOL%29.aspx

| **Particularly Sensitive Sea Areas (PSSAs)** | |
|---|---|
| The 1972 Convention on the International Regulations for Preventing Collisions at Sea (COLREGs) | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf (page 83) |
| International Convention for the Safety of Life at Sea 1974 (SOLAS 1974) + amendments<br>Protocol of 1978 relating to the International Convention for Safety of Life at Sea as amended (SOLAS PROT 1978) + amendments<br>Protocol of 1988 relating to the International Convention for the Safety of Life at Sea 1974 (SOLAS PROT 1988) + amendments | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf (Page 11)<br>(Page 66)<br>(Page 73) |
| International Convention for the Control and Management of Ship's Ballast Water and Sediments 2004<br>(BWM Convention) | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf (Page 494) |
| **International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, London, 1 December 1978** (STCW 1978) and **STCW Code**<br>**A**mended and modified by:<br>1995 Amendments<br>Manila Amendments 2010 | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf (Page 384) |
| International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances at Sea, 1996 (HNS 1996)<br>Superseded by<br>2010 HNS Protocol (HNS PROT 2010) | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf (Page 472)<br>(Page 475) |

| | |
|---|---|
| International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC 1990)<br><br>Protocol on Preparedness, Response and Cooperation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (OPRC-HNS 2000) | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf<br>(Page 461)<br><br>(Page 466) |
| International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001 (AFS 2001) | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf<br><br>(Page 488) |
| International Convention on Maritime Search and Rescue 1979, as amended (SAR 1979) | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf<br>(Page 404) |
| **Enhanced contingency planning for passenger ships operating in areas remote from Search and Rescue (SAR) facilities**<br>**(MSC.1/Circ.1184)** | http://www.imo.org/blast/blastDataHelper.asp?data_id=14711&filename=1184.pdf |
| **Guidelines on voyage planning for passenger ships operating in remote areas (IMO Resolution A.999)** | http://www.imo.org/blast/blastDataHelper.asp?data_id=29939&filename=A999(25).pdf |
| Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (MEPC.1/Circ. 8337 April 2014) | http://docs.nrdc.org/water/files/wat_14050501a.pdf |
| **REGIONAL** | |
| The Agreement on cooperation on Aeronautical and Maritime Search and Rescue in the Arctic | http://www.arctic-council.org/index.php/en/document-archive/category/20-main-documents-from-nuuk |
| Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic | http://www.arctic-council.org/eppr/agreement-on-cooperation-on-marine-oil-pollution-preparedness-and-response-in-the-arctic/ |
| **Guidelines for Ships operating in Polar Waters** | http://www.imo.org/Publications/Documents/Attachments/Pages%20from%20E190E.pdf |
| **General Guidance on the Voluntary Interim Application of D1 Ballast Water Exchange Standard** | http://www.ospar.org/html_documents/ospar/html/ospar_helcom_guidance_ballast_water.pdf |

| | |
|---|---|
| Paris Memorandum of Understanding on Port State Control (Paris MoU) | http://www.parismou.org/ |
| **Memorandum of Understanding on Port State Control in the Asia-Pacific Region (Tokyo MoU)** | http://www.tokyo-mou.org/memoran.htm |
| **Guidelines for Expedition Cruise Operations in the Arctic** | http://www.aeco.no/guidelines.htm |
| **Guidelines for Visitors to the Arctic** | http://www.aeco.no/documents/AECO_ENGbrosjyrekorr.pdf |
| **CANADA** | |
| **Arctic Waters Pollution Prevention Act (R.S, 1985) c A-12** | http://laws-lois.justice.gc.ca/eng/acts/A-12/ |
| **Canada Shipping Act 2001**<br><br>Northern Canada Vessel Traffic Services Zone (NORDREG) | http://laws.justice.gc.ca/PDF/C-10.15.pdf<br><br>The Act authorizes regulations<br>to be passed establishing vessel traffic services (VTS) zones in an Arctic shipping safety control zone whereby vessel reporting and clearance would be mandatory.<br><br>http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-127/ |
| **Canada Marine Act (1988, c10) updated 2011.10.29** | http://laws-lois.justice.gc.ca/eng/acts/C-6.7/ |
| **NORWAY** | |
| **The Norwegian Maritime Code**<br>**(and amendments)** | http://www.sjofartsdir.no/en/legislation/laws/39-of-24-june-1994-the-norwegian-maritime-code/ |
| **Ship Safety and Security Act of 16 February 2007** | http://www.rederi.no/nrweb/mm.nsf/lupgraphics/Act%20of%2016%20February%202007%20No.%2009%20relating%20to%20Ship%20Safety%20and%20Security.pdf/$file/Act%20of%2016%20February%202007%20No.%2009%20relating%20to%20Ship%20Safety%20and%20Security.pdf<br><br>Applies to Norwegian and foreign ships except those with an overall length of 24 metres or less which are not used f<br>or commercial purposes |

| | |
|---|---|
| **Regulation of 7 July 2009 No. 992 concerning the prevention of transfer of alien organisms via ballast water and sediments from ships**<br><br>**(Ballast Water Regulation)** | http://old.sjofartsdir.no/upload/19470/Regulation%20of%207%20July%202009%20No.%20992%20concerning%20the%20prevention%20of%20transfer%20of%20alien%20organisms%20via%20ballast%20water%20and%20sediments%20from%20ships%20(the%20Ballast%20Water%20Regulation).pdf |
| **Acts**<br><br>**Regulations**<br><br>**Directives** | http://www.sjofartsdir.no/en/legislation/#laws<br><br>http://www.sjofartsdir.no/en/legislation/#regulations<br><br>http://www.sjofartsdir.no/en/legislation/#directives |
| **USA** | |
| ***Maritime Transportation Security Act of 2002. Public Law* 107-295 of Nov. 25, 2002**<br>**(**Maritime Transportation Security Act of 2002) | http://www.admiraltylawguide.com/documents/martransecact02.pdf |
| **Ocean Shipping Reform Act of 1998. Public Law 105-258 of Oct. 14, 1998** | http://www.admiraltylawguide.com/documents/osra98.pdf |
| **Clean Air Act** | http://www.gpo.gov/fdsys/pkg/USCODE-2008-title42/pdf/USCODE-2008-title42-chap85.pdf |
| **RUSSIAN FEDERATION** | |
| 1990 Regulations | |
| 1996 Guide to navigating through the Northern Sea Route | |
| **1996 Regulations for Icebreaker and Pilot Guiding of Vessels through the Northern Sea Route** | |
| **1996 Requirements for the Design, Equipment and Supplies of Vessels Navigating the Northern Sea Route** | |
| **Merchant Shipping Code of the Russian Federation 1999** | http://www.arbitratus.ru/english/rf_codes/m_ship.shtml |
| **GREENLAND (DENMARK)** | |
| Danish Maritime Authority (DMA): | |

| | |
|---|---|
| Acts<br>Orders<br>Technical regulations | http://www.dma.dk/Legislation/Sider/Acts.aspx<br>http://www.dma.dk/Legislation/Sider/Orders.aspx<br>http://www.dma.dk/Legislation/Sider/TechnicalRegulations.aspx |
| Royal decree on the entry into force for Greenland of acts amending the act on safety at sea | http://www.dma.dk/SiteCollectionDocuments/Legislation/Acts/2013/Anordning-71-29012013-om%20ikrafttr%C3%A6den%20for%20Gr%C3%B8nland%20af%20love%20om%20%C3%A6ndringer%20af%20lov%20om%20sikkerhed%20til%20s%C3%B8s-.pdf |
| Mandatory ship reporting systems (GREENPOS: Applies to all ships, on voyage to or from Greenland ports and places of call. COASTAL CONTROL [KYSTKONTROL]: All ships of 20 gross tonnage and more, and fishing vessels, on voyage between Greenland ports and places of call) | http://www.imo.org/blast/blastDataHelper.asp?data_id=5395&filename=221.pdf |
| Order 417 of 28 May 2009 on technical regulation on safety of navigation in Greenland territorial waters | http://www.soefartsstyrelsen.dk/SiteCollectionDocuments/CMR/Order%20on%20technical%20regulation%20on%20safety%20of%20navigation,%20FEB%2011%20updated%20translation.pdf |
| DMA has dedicated information relating to shipping Greenland waters.<br><br>Refers ships to IMO A.1024(26) Guidelines for ships operating in polar waters and IMO MSC1/Circ 1184 Enhanced contingency planning guidance for passenger ships operating in areas remote from SAR facilities) | http://www.dma.dk/ships/sider/greenlandwaters.aspx |

# ANNEX III REGULATORY INSTRUMENTS RELATING TO FISHERIES AND AQUACULTURE

| Instrument/Agreement | Link |
|---|---|
| **SUPRANATIONAL** | |
| The 1982 United Nations Convention on the Law of the Sea (UNCLOS) | http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf |
| **The 1995 Agreement for the Implementation of the provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (UNFSA)** | http://www.un.org/depts/los/convention_agreements/texts/fish_stocks_agreement/CONF164_37.htm |
| **1993 Agreement to promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (FAO Compliance Agreement)** | http://www.fao.org/legal/treaties/012t-e.htm |
| **2009 Agreement on port state measures to prevent, deter and eliminate illegal, unreported and unregulated fishing (FAO Port State Agreement)** | http://www.fao.org/Legal/treaties/037t-e.pdf |
| **1995 The FAO Code of Conduct for Responsible Fisheries (FAO Code of Conduct)** | ftp://ftp.fao.org/docrep/fao/005/v9878e/v9878e00.pdf |
| **2008 International Guidelines for the Management of Deep-Sea Fisheries in the High Seas** | http://www.fao.org/docrep/011/i0816t/i0816t00.htm |
| **2010 International Guidelines on Bycatch Management and Reduction of Discards** | http://www.ofdc.org.tw/organization/01/fao/13_e.pdf |
| International Plan of Action to Deter to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing | http://www.fao.org/docrep/003/y1224e/y1224e00.htm |
| Convention on Biological Diversity (CBD) | www.cbd.int/ |
| **Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention)** | http://www.cms.int/documents/convtxt/cms_convtxt.htm |
| **International Convention for the Regulation of Whaling** | http://www.iwcoffice.org/commission/convention.htm |
| **REGIONAL** | |
| **European Union Common Fisheries Policy** | http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002R2371:EN:NOT |
| **International Convention for the Conservation of Atlantic Tunas (ICCAT Convention)** | http://www.iccat.es/Documents/Commission/BasicTexts.pdf |

| | |
|---|---|
| **Convention on Future Multilateral Cooperation in North East Atlantic Fisheries (NEAFC)** | http://www.neafc.org/basictexts |
| **Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries (NAFO)** | http://www.nafo.int/about/frames/about.html |
| **Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPF Convention)** | http://www.wcpfc.int/doc/convention-conservation-and-management-highly-migratory-fish-stocks-western-and-central-pacific- |
| **Agreement on Cooperation in Research, Conservation and management of marine Mammals in the North Atlantic (NAMMCO Agreement)** | http://www.nammco.no/ |
| **Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (The Donut Hole Agreement)** | http://www.nmfs.noaa.gov/ia/intlagree/docs/Pollock_in_Bering_Sea.pdf |
| **Convention for the Conservation of Anadromous Stocks in the North Pacific Ocean (NPAFC)** | http://www.npafc.org/new/index.html |
| **Convention for the Conservation of Salmon in the North Atlantic Ocean (NASCO)** | http://www.nasco.int/convention.html |
| **The EU, Faroe Islands, Iceland, Norway and Russia long term management plan for spring-spawning herring** | |
| **Agreement concerning mutual fishery relations between Greenland and the Russian Federation** | http://untreaty.un.org/unts/60001_120000/30/21/00059047.pdf |
| Agreement on mutual fishery relations. Joint Faroese-Russian Fisheries Commission | http://www.jointfish.com/eng |
| **Agreement between the Government of Iceland, the Government of Norway and the Government on the Russian Federation Concerning Certain Aspects of Co-operation in the Area of Fisheries and associated Protocols** | http://www.ecolex.org/ecolex/ledge/view/RecordDetails?id=TRE-001817&index=treaties |
| **Convention for the Preservation of the Halibut Fishery**<br>New Convention between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea<br>Protocol Amending the Convention | http://www.iphc.int/home.html |

| | |
|---|---|
| **Treaty between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon**<br><br>Yukon River Salmon Agreement | http://www.psc.org/pubs/treaty/treaty.pdf<br><br>http://www.psc.org/about_treaty.htm |
| **Agreement on fishing between the European Community and the Kingdom of Norway** | http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1980:226:0048:0050:EN:PDF |
| Council Regulation (EC) No. 753/2007 on the conclusion of the Fisheries Partnership Agreement between the European Community on the one hand, and the Government of Denmark and the Home Rule Government of Greenland, on the other hand. | http://faolex.fao.org/docs/pdf/mul-72583.pdf |
| **USA** | |
| FAO web pages of USA fisheries legislation | http://www.fao.org/fishery/countrysector/FI-CP_US/5/en |
| Magnuson- Stevens Fishery Conservation and Management Reauthorization Act of2006 | http://www.nmfs.noaa.gov/sfa/magact/MSA_Amended_2007%20.pdf |
| US Marine Mammal Protection Act 1972 as amended 2007 | http://www.nmfs.noaa.gov/pr/pdfs/laws/mmpa.pdf |
| US Endangered Species Act 1973 | http://www.nmfs.noaa.gov/pr/pdfs/laws/esa.pdf |
| **S.J. Res. No. 17 A joint resolution directing the United States to initiate international discussions and take necessary steps with other Nations to negotiate an agreement for managing migratory and transboundary fish stocks in the Arctic Ocean** | http://www.govtrack.us/congress/billtext.xpd?bill=sj110-17 |
| **NORWAY** | |
| **FAO web pages of Norwegian fisheries legislation** | http://www.fao.org/fishery/facp/NOR/en |
| **Marine Resources Act** | http://www.fiskeridir.no/english/fisheries/regulations/acts/the-marine-resources-act |
| Nature Conservation Act | http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=002316&database=FAOLEX&search_type=link&table=result&lang=eng&format_name=@ERALL |
| Wildlife Act | http://eelink.net/~asilwildlife/norway.html |
| Decree No. 1653 of 2004 to protect vulnerable habitats | http://faolex.fao.org/cgi- |

| | |
|---|---|
| in international navigable waters | bin/faolex.exe?rec_id=041909&database=FAOLEX&search_type=link&table=result&lang=eng&format_name=@ERALL |
| Act No. 79 of 2005 relating to aquaculture (Aquaculture Act) | http://www.regjeringen.no/upload/kilde/fkd/reg/2005/0001/ddd/pdfv/255327-l-0525_akvakulturloveneng.pdf |
| The Act Relative to Prevention of Cruelty to Animals | |
| The Act Relative to Food Production and Food Safety Act (The Food Safety Act 2003) | http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=051410&database=faolex&search_type=link&table=result&lang=eng&format_name=@ERALL |
| **The Agreement on the European Economic Area** | http://www.efta.int/legal-texts/eea |
| **CANADA** | |
| **FAO web pages of Canada fisheries legislation** | http://www.fao.org/fishery/countrysector/FI-CP_CA/5/en |
| **Fisheries Act** (R.S.C., 1985, c. F-14) | http://laws.justice.gc.ca/eng/acts/F-14/ |
| **Oceans Act** (S.C. 1996, c. 31) | http://laws-lois.justice.gc.ca/eng/acts/O-2.4/index.html |
| **RUSSIAN FEDERATION** | |
| FAO web pages of Russian Federation legislation | http://www.fao.org/fishery/countrysector/FI-CP_RU/5/en |
| Federal Law No. 166-FZ on fisheries and conservation of aquatic biological resources of December 2004 | http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=041882&database=FAOLEX&search_type=link&table=result&lang=eng&format_name=@ERALL |
| Law of the Russian Federation "On the Animal World" (1995), | ftp://ftp.fao.org/fi/document/fcp/en/FI_CP_RU.pdf |
| The Federal Law "On the Continental Shelf of the Russian Federation" (1995) | |
| The Federal Law "On the Exclusive Economic Zone of the Russian Federation" (1998) | |
| **GREENLAND (DENMARK)** | |
| FAO webpage of fisheries legislation in Greenland | http://www.fao.org/fishery/countrysector/FI-CP_GL/5/en |
| Fishery Act of 1996 | http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=105543&database=faolex&search_type=link&table=result&lang=eng&format_name=@ERALL |
| **AQUACULTURE** | |
| **NORWAY** | |

| | |
|---|---|
| **The Aquaculture Act of 2005** | http://www.regjeringen.no/upload/kilde/fkd/reg/2005/0001/ddd/pdfv/255327-l-0525_akvakulturloveneng.pdf |
| **The Act Relative to Food Production and Food Safety Act 2003** | http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=051410&database=faolex&search_type=link&table=result&lang=eng&format_name=@ERALL |
| The Act Relative to Prevention of Cruelty to Animals (1974, as amended in 2003) | |
| **The Agreement on the European Economic Area** | http://www.efta.int/media/documents/legal-texts/eea/the-eea-agreement/Main%20Text%20of%20the%20Agreement/EEAagreement.pdf |
| **The Regulation relative to Sea Ranching (2003)** | http://www.fao.org/fishery/shared/faolextrans.jsp?xp_FAOLEX=LEX-FAOC031699&xp_faoLexLang=E&xp_lang=en |
| **CANADA** | |
| **Fish Inspection Act (1985)** | http://laws-lois.justice.gc.ca/eng/acts/F-12/ |
| **The Feeds Act (1985)** | http://laws-lois.justice.gc.ca/eng/acts/f-9/ |
| **The Food and Drugs Act (1985)** | http://laws-lois.justice.gc.ca/eng/acts/F-27/index.html |
| **The Pest Control Products Act (2002)** | http://laws-lois.justice.gc.ca/eng/acts/p-9.01/page-1.html |
| **Fish Health Protection Regulations** | http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._812/ |
| **RUSSIAN FEDERATION** | |
| Aquaculture in the Russian Federation is currently governed by 9 regional laws.<br>The FAO anticipate that at least two new Federal Laws “On the Coastal Fishery” and “On Aquaculture” will be considered by Russian legislators. | http://www.fao.org/fishery/legalframework/nalo_russia/en |

# ANNEX IV REGULATORY INSTRUMENTS RELATING TO OIL AND GAS ACTIVITIES

| Instrument/Agreement | Link to text (where available) / Comments |
|---|---|
| **SUPRANATIONAL** | |
| **The Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter, London, 1972 (The London Convention)**<br><br>1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 29 December 1972 | http://www.admiraltylawguide.com/conven/dumping1972.html<br><br>http://www.admiraltylawguide.com/conven/protodumping1996.html |
| International Convention for the Prevention of Marine Pollution from Ships, 1973, as amended by the Protocol of 1978 relating thereto (MARPOL 73/78)<br><br>Annex I: Regulations for the Prevention of Pollution by Oil<br><br>Annex II: Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk<br><br>Annex III: Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form<br><br>Annex IV: Prevention of Pollution by Sewage from Ships<br><br>Annex VI: Prevention of Air Pollution from Ships | http://www.imo.org/KnowledgeCentre/ReferencesAndArchives/HistoryofMARPOL/Documents/MARPOL%20-%201978%20Protocol.pdf<br><br>The International Convention for the Prevention of Pollution from Ships (MARPOL) is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes.<br><br>The MARPOL Convention was adopted on 2 November 1973 at IMO. The Protocol of 1978 was adopted in response to a spate of tanker accidents in 1976-1977. As the 1973 MARPOL Convention had not yet entered into force, the 1978 MARPOL Protocol absorbed the earlier Convention. The combined instrument entered into force on 2 October 1983. In 1997, a Protocol was adopted to amend the Convention and a new Annex VI was added which entered into force on 19 May 2005. MARPOL has been updated by amendments through the years[137].<br><br>As far as the offshore oil and gas industry goes the aspects that fall under MARPOL include machinery space discharge, sewage discharges and garbage at sea. |
| **International Convention on Oil Pollution Preparedness, Response, and Co-operation (OPRC) 1990**<br><br>**The Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances 2000 (HNS Protocol)** | http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf<br><br>As well as applying to shipping Operators of offshore units under the jurisdiction of Parties are also required to have oil pollution emergency plans or similar arrangements<br><br>http://www.imo.org/About/Conventions/StatusOfConventions/Documents/Status%20-%202015.pdf |

[137] http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-%28MARPOL%29.aspx

| | |
|---|---|
| **UNEP Environmental Law Guidelines and Principles: Offshore Mining and Drilling** | Conclusions of the study of legal aspects concerning the environment related to offshore mining and drilling within the limits of national jurisdiction. Decision 10/14/VI of the Governing Council of UNEP, 31 May 1982. UNEP Governing Council calls upon governments to make use of the "*guidelines and recommendations in the formulation of bilateral or multilateral conventions .....*" |
| **REGIONAL** | |
| **OSPAR**: The following are the OSPAR Decisions relating to the offshore oil and gas industry. Non-binding Recommendations and Agreements, including guidelines, are listed at the webpage cited in column 11 of this table.<br>**Decision 2007/2 on the Storage of Carbon Dioxide Streams in Geological Formations**<br>**Decision 2007/2 on the Storage of** Carbon Dioxide Streams in Geological Formations<br>Decision 2007/2 on the Storage of Carbon Dioxide Streams in Geological Formations<br>Decision 2000/2 on a Harmonised Mandatory Control System for the Use and Discharge of Offshore Chemicals (as amended by OSPAR Decision 2005/1)<br>Decision 2000/3 on the Use of Organic-phase Drilling Fluids (OPF) and the Discharge of OPF-Contaminated Cuttings<br>Decision 98/3 on the Disposal of Disused Offshore Installations | http://www.ospar.org/content/content.asp?menu=00040400000000_000000_000000 |
| Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic | http://www.arctic-council.org/eppr/agreement-on-cooperation-on-marine-oil-pollution-preparedness-and-response-in-the-arctic/ |
| Arctic Offshore Oil and Gas Guidelines 2009 | http://www.pame.is/offshore-oil-and-gas/77-arctic-offshore-oil-and-gas-guidelines-2009 |
| **Arctic Marine Strategic Plan (2004)** | http://www.pame.is/arctic-marine-strategic-plan |
| **The Arctic Environmental Protection Strategy, (1991)** | http://library.arcticportal.org/1542/1/artic_environment.pdf |
| **Guidelines for the Transfer of Refined Oil and Oil Products in the Arctic (TROOP)(2004)** | http://arcticportal.org/images/stories/pdf/TROOP_-_English_2.pdf |
| **Arctic Shoreline Clean-up Assessment Technique (SCAT) Manual (2004)** | http://www.arctic-council.org/eppr/completed-work/oil-and-gas-products/arctic-shoreline-clean-up-assessment-technique-scat-manual/ (link to EPPR page) |
| **Field Guide for Oil Spill Response in Arctic Water (1998)** | http://eppr.arctic-council.org/content/fldguide/fldguide.pdf |

| | |
|---|---|
| **EPPR Guidelines for oily waste management (2009)** | http://www.arctic-council.org/index.php/en/about/documents/category/61-eppr# |
| **The Arctic Guide to National emergency response arrangements and contacts** | http://eppr.arctic-council.org/ |
| **Petroleum and natural gas industries - Arctic offshore structures: Standard ISO 19906:2010** | http://www.iso.org/iso/catalogue_detail.htm?csnumber=33690 |
| **MULTILATERAL AND BILATERAL** | |
| **The Agreement between Denmark, Finland, Iceland, Norway and Sweden Concerning Cooperation in Measures to deal with Pollution of the Sea by Oil or other Harmful Substances** | https://treaties.un.org/doc/Publication/UNTS/Volume%202084/v2084.pdf<br>UN Treaty Series Volume 2084, 1-3617, pages 324-328 (English translation) |
| Agreement between the Government of Canada and the Government of the Kingdom of Denmark for Cooperation Relating to the Marine Environment | http://www.treaty-accord.gc.ca/text-texte.aspx?id=101887<br>(Annex A: Contingency plan concerning Pollution Incidents Resulting from Offshore Hydrocarbon Exploration or Exploitation) |
| **Agreement between the Governments of the Kingdom of Norway and the Russian Federation on Cooperation in Environmental Matters, Oslo, 3 September 1992** | www.barentsportal.com<br>Treaty under which Joint Norwegian-Russian Commission on Environmental Protection functions<br>No link to text |
| Agreement between the Russian Federation and Government of the Kingdom of Norway Concerning Cooperation on the Combatment of Oil Pollution in the Barents Sea, Moscow, 28 April 1994 | No link to text |
| **Treaty between the Kingdom of Norway and the Russian Federation concerning Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean. 15 September 2010** | http://www.un.org/depts/los/LEGISLATIONANDTREATIES/PDFFILES/TREATIES/NOR-RUS2010.PDF |
| Agreement between the Government of the Union of Soviet Socialist Republics and the Government of the United States of America concerning Cooperation in Combating Pollution in the Bering and Chukchi Seas in emergency situations, 1989. | www.dec.state.ak.us/spar/perp/plans/uc/mou/Kp-US_USSR_89.pdf<br>Incorporates: Joint Contingency Plan of the United States and the Russian Federation on Combating Pollution in the Bering and Chukchi Seas |
| **Canada-United States Joint Marine Pollution Contingency Plan (2003)** | www.dfo-mpo.gc.ca/Library/343409.pdf |
| **CANADA** | |
| **The Canada Oil and Gas Operations Act (1985)** | http://laws-lois.justice.gc.ca/eng/acts/O-7/ |

| | |
|---|---|
| | Applies in respect of the exploration and drilling for and the production, conservation, processing and transportation of oil and gas |
| **The Canada Petroleum Resources Act (1985** | http://laws-lois.justice.gc.ca/eng/acts/C-8.5/ |
| **Canada Oil and Gas Drilling and Production Regulations (SOR/2009-315) as amended 31.12.2009) (COGDP)** | http://laws.justice.gc.ca/eng/regulations/SOR-2009-315/ |
| **Canada Oil and Gas Installations Regulations (SOR/96-118)** | http://laws.justice.gc.ca/eng/regulations/SOR-96-118/page-4.html |
| **Canada Oil and Gas Geophysical Operations Regulations (SOR/96-117)** | http://laws.justice.gc.ca/eng/regulations/SOR-96-117/index.html |
| **Arctic Waters Pollution Prevention Act (R.S.C., 1985, c. A-12)** | http://laws.justice.gc.ca/eng/acts/A-12/ |
| **Arctic Water Pollution Prevention Regulations (C.R.C., c. 354)** | http://laws.justice.gc.ca/eng/regulations/C.R.C., c. 354/index.html |
| **NORWAY** | |
| **Norwegian Petroleum Directorate[138] (NPD)lists of all Acts, Decrees and Regulations relating to oil and gas activities :**<br>• **Acts**<br>• **Decrees and Regulations** | http://www.npd.no/en/Regulations/Acts/<br>http://www.npd.no/en/Regulations/Regulations/ |
| **Act 29 November 1996 No. 72 relating to petroleum activities** | http://www.npd.no/en/Regulations/Acts/Petroleum-activities-act/ |
| Act 21 December 1990 no 72 relating to tax on discharge of $CO_2$ in the petroleum activities on the continental shelf | http://www.npd.no/en/Regulations/Acts/CO2-discharge-tax/ |
| Guidelines on Implementation of seismic surveys on the Norwegian Continental Shelf. (In Norwegian only) | http://www.npd.no/globalassets/global/norsk/5-regelverk/regelverksoriginaler/veiledninger/veileder_seismiske_undersokelser.pdf |
| **Guidelines for plan for development and operation of a petroleum deposit (PDO) and plan for installation and operation of facilities for transport and utilisation of petroleum (PIO) 4 February 2010** | http://www.npd.no/Global/Engelsk/5-Rules-and-regulations/Guidelines/PDO-PIO-guidelines_2010.pdf |

[138] NPD is a governmental specialist directorate and administrative body reporting to the Norwegian Ministry of Petroleum and Energy

| | |
|---|---|
| **NORSOK Standards**[139] | https://www.standard.no/en/sectors/energi-og-klima/petroleum/norsok-standards/#.VL438Sw-dpk |
| **USA** | |
| **Outer Continental Shelf Lands Act** | http://epw.senate.gov/ocsla.pdf<br>Provides a system for offshore oil and gas exploration, leasing and development |
| Submerged Lands Act of 1953 | http://www.gpo.gov/fdsys/pkg/USCODE-2011-title43/pdf/USCODE-2011-title43-chap29.pdf |
| **Oil Pollution Act of 1990** | http://epw.senate.gov/opa90.pdf |
| **The National Oil and Hazardous Substances Pollution Contingency Plan** | http://www.epa.gov/osweroe1/content/lawsregs/ncpover.htm |
| The Solid Waste Disposal Act (**Resource Conservation Recovery Act)** | http://epw.senate.gov/rcra.pdf |
| **The Clean Air Act** | http://www.gpo.gov/fdsys/pkg/USCODE-2008-title42/pdf/USCODE-2008-title42-chap85.pdf |
| **RUSSIAN FEDERATION** | |
| **Federal Law on the Continental Shelf of the Russian Federation** | http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/PDFFILES/RUS_1995_Law.pdf |
| **Subsoil Law** | |
| Federal Law No. 191-FZ of 1998 on the Exclusive Economic Zone | http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=021536&database=FAOLEX&search_type=link&table=result&lang=eng&format_name=@ERALL |
| Federal Law No.69-FZ of 1999 on gas supplies in the Russian Federation | http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=036131&database=FAOLEX&search_type=link&table=result&lang=eng&format_name=@ERALL |
| **GREENLAND** | |
| **Act of 7 December 2009 on mineral resources and mineral resource activities (the Mineral Resources Act)** | http://www.govmin.gl/images/stories/faelles/mineral_resources_act_unofficial_translation.pdf |
| Guidelines for Preparing an Environmental Impact Assessment (EIA) report related to stratigraphic drilling offshore Greenland | http://www.govmin.gl/images/stories/petroleum/BMP_EIA_Guidelines_stratigraphic_drilling.pdf |
| **Guidelines for applications, execution and reporting of offshore hydrocarbon exploration activities (excluding** | http://www.bmp.gl/images/stories/petroleum/Guidelines_offshore_HC3_uk_May%202011.pdf |

[139] Developed by the Norwegian petroleum industry, aim to "ensure adequate safety, value adding and cost effectiveness for petroleum industry developments and operations. Furthermore, NORSOK standards are as far as possible intended to replace oil company specifications and serve as references in the authorities regulations"

| | |
|---|---|
| **drilling) in Greenland** | |
| **Drilling Guidelines** | http://www.bmp.gl/images/stories/petroleum/110502_Drilling_Guidelines.pdf |
| **NERI[140] Guidelines to environmental impact assessment of seismic activities in Greenland waters** | http://www.bmp.gl/images/stories/petroleum/environmental_reports/NERI_report_785_sec_ed_2010.pdf |
| **Guidelines for Social Impact Assessments** | http://www.govmin.gl/images/stories/petroleum/SIA_guidelines.pdf |
| **International Regulators Forum** | http://www.irfoffshoresafety.com/<br>**Comprises eleven regulators of health and safety in the offshore upstream oil and gas industry. Aim is to advance improvements in health and safety through collaboration in joint programmes and sharing information.** |
| OGP HSE Guidelines for Metocean and Arctic Surveys | http://www.ogp.org.uk/pubs/447.pdf |

## References

Josefson, J., Rotar, A., Rice, B. 2014. Oil and gas regulation in the Russian Federation: overview. Global Practical Law. global.praticallaw.com/0-527-3028

Vann, A. 2014. Offshore Oil and Gas Development: Legal Framework. Congressional Research Service Report. September 26, 2014. Available at: https://www.fas.org/sgp/crs/misc/RL33404.pdf. Last accessed 20 January 201ANNEX V

[140] National Environmental Research Institute

# ANNEX V ENVIRONMENTAL GOVERNANCE INSTRUMENTS

| Instrument/Agreement/ Institution | Link |
|---|---|
| UN Framework Convention on Climate Change (UNFCCC, 1992)<br><br>Kyoto Protocol (1997) | http://unfccc.int/2860.php<br><br>http://unfccc.int/kyoto_protocol/items/2830.php |
| Climate and Clean Air Coalition (CCAC) | http://www.ccacoalition.org/ |
| The Convention on Long-range Transboundary Air Pollution (LRTAP Convention 1979)<br><br>Convention on Environmental Impact Assessment in a Transboundary Context (the Espoo Convention)<br><br>Convention on the Protection and Use of Transboundary Watercourses and International Lakes<br><br>Convention on the Transboundary Effects of Industrial Accidents<br><br>Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters | http://www.unece.org/env/treaties/welcome.html |
| Minamata Convention on Mercury (2013) | http://www.mercuryconvention.org/ |
| Global Programme for Action for the Protection of the Marine Environment from Land-based Activities | http://www.gpa.unep.org/ |
| Regional Programme for Action for the Protection of the Arctic marine Environment from Land-based Activities | http://www.pame.is/index.php/projects/rpa-reports |
| International Convention of the Regulation of Whaling (ICRW, 1946) | https://iwc.int/convention |
| International Agreement for the Conservation of Polar Bears (Polar Bear Agreement, 1973) | http://pbsg.npolar.no/en/index.html |
| Convention on the Conservation of Migratory Species of Wild Animal (CMS, 1979) | http://www.cms.int/ |
| Convention on Biological Diversity (CBD, 1993) | http://www.cbd.int/convention/ |
| Convention for the Protection of the World Cultural and Natural Heritage (UNESCO, 1972) | http://whc.unesco.org/en/conventiontext/ |
| RAMSAR Convention on Wetlands (1971) | http://www.ramsar.org/ |

# ANNEX VI

## Case Study: Traditional knowledge and institutional constraints on adaptation

The success of Sámi reindeer herders is dependent upon the freedom to move. In the past few decades a variety of factors, including government policies, have constrained their ability to respond and cope with climate warming and other changes. One of those stresses arises from national laws that emphasize meat production and large herds dominated by females and calves (ACIA, 2004).

The traditional Sámi concept of a 'beautiful' herd of reindeer contains a diverse range of animals – the antithesis of modern pure-bred herds of livestock which have been developed by selection to fulfil the modern requirements of high-yielding production systems. The traditional diversity of reindeer herds reflects a strategy which aims to reduce vulnerability to the consequences of unfavourable – and unpredictable – conditions (Magga *et al.,* 2011).

Today reindeer herding in Norway is highly regulated. The current level of regulation arose from the 1978 Reindeer Husbandry Act through which Saami reindeer pastoralism was brought more closely under the control of The Royal Norwegian Ministry of Agriculture and Food. Seemingly well intentioned, the Act reflected a desire to improve the economic basis of Saami reindeer pastoralism and to help herders achieve the economic stability. However, the immediate result was that central government became one of the most potent forces shaping the development of the industry. Policies established by the central administration now influence almost all aspects of reindeer pastoralism in Norway (Tyler et al, 2007).

The herders' traditional responses to changes in both the natural and the socio-economic environments have depended on a flexibility in herding practice but this flexibility is now being undermined, not only by reduced freedom of action resulting from loss of habitat and predation but also by aspects of governance – particularly economic and legal. This may lead to new climatic conditions threatening the system in unprecedented way (*ibid*.).

Reinert *et al*. (2009) speculate on the implications of this for adaptation to climate-change: "*The ability to self-organize according to their traditional knowledge is an important factor in strengthening reindeer herders' resilience to changes. ...Institutional settings where reindeer pastoralists' traditional organization is restricted—as in Norway—represent a serious institutional constraint on adaptation*."

Development of appropriate methodologies for assessing the adaptive capacity, the vulnerability and the resilience of social–ecological systems to change remains a challenge. Key to the solution are recognition of the knowledge systems of Arctic cultures and the full engagement of local people throughout the process (Tyler et al, 2007).

By comparison, herders in the Yamal region of the Russian Federation have fared better. The Yamala government has imposed communism structures onto the traditional knowledge system, creating a formal structure where, essentially, the leader of the reindeer herders assumes the role of the brigadier. The Yamala government contacts the brigadier if there is an issue. This arrangement shows trust in the herders and illustrates a good example of reindeer governance structures (ACCESS IP meeting).

## References

ACIA. 2004. Impacts of a warming climate: Arctic Climate Impact Assessment. Cambridge University Press

Magga, O. H., Mathiesen, S. D., Corell, R. W., Oskal, A, Benestad, R., Bongo, M. P. *et al.* (2011) Reindeer herding, traditional knowledge and adaptation to climate change and loss of grazing land. EALAT project executive summary. Arctic Council and International Centre for Reindeer Husbandry. Fagtrykk Idé AS, Alta, Norway

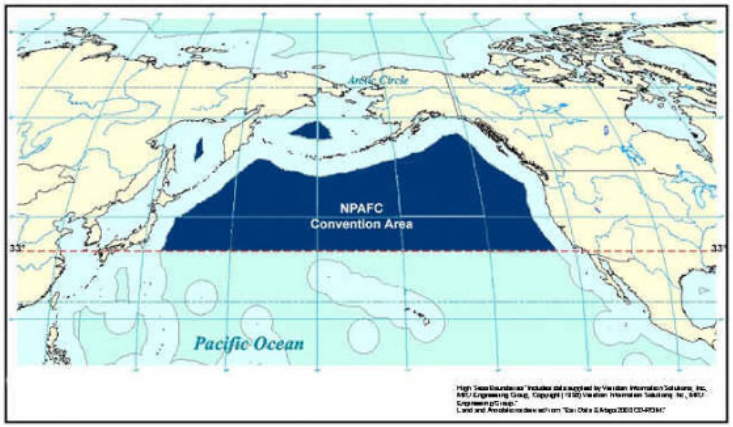
Reinert, E. S., Aslaksen, I., Eira, I. M. G., Mathiesen,S. D., Reinert, H., Turi, E. I. 2009. Adapting to climate change in Sámi reindeer herding: the nation-state as problem and solution. In *Adapting to Climate Change: Thresholds, Values, Governance*, eds. W. Neil Adger, Irene Lorenzoni and Karen L.

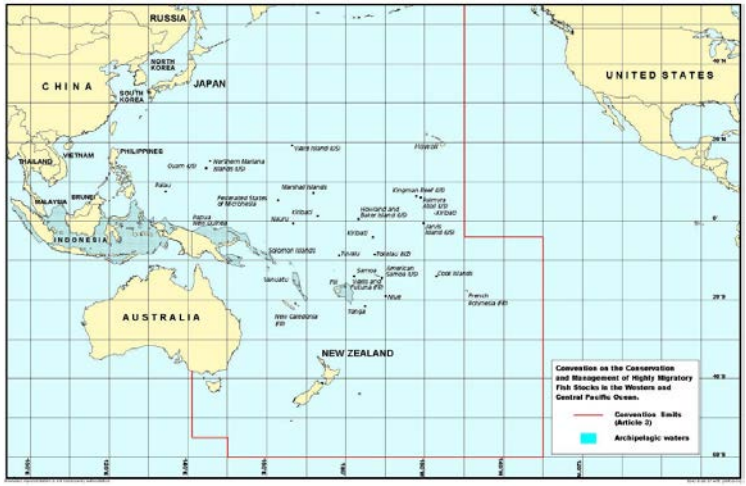
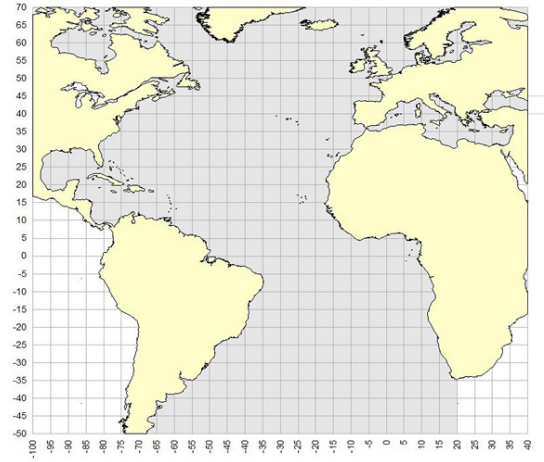
O'Brien. Cambridge University Press, pp 417-432

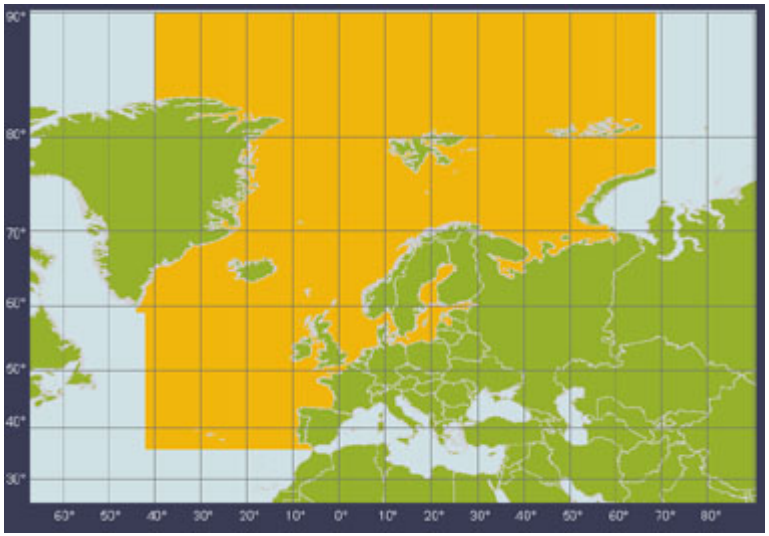
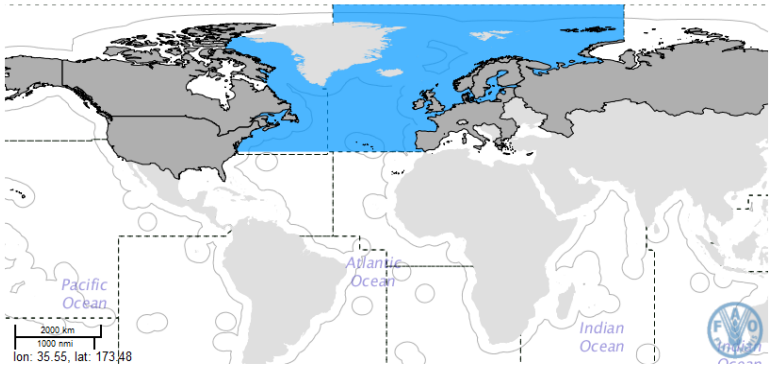
Tyler, N. J. C., Turi, J. M., Sundset, M. A., Strøm Bull, K., Sara, M. N. *et al*. 2007. Saami reindeer pastoralism under climate change: Applying a generalized framework for vulnerability studies to a sub-arctic social–ecological system. Global Environmental Change 17, 191–206

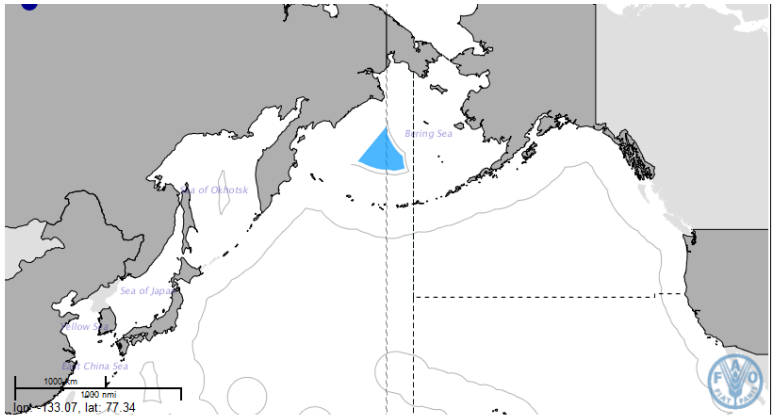
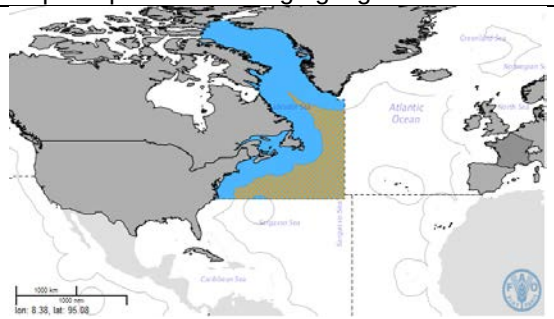
# ANNEX VII

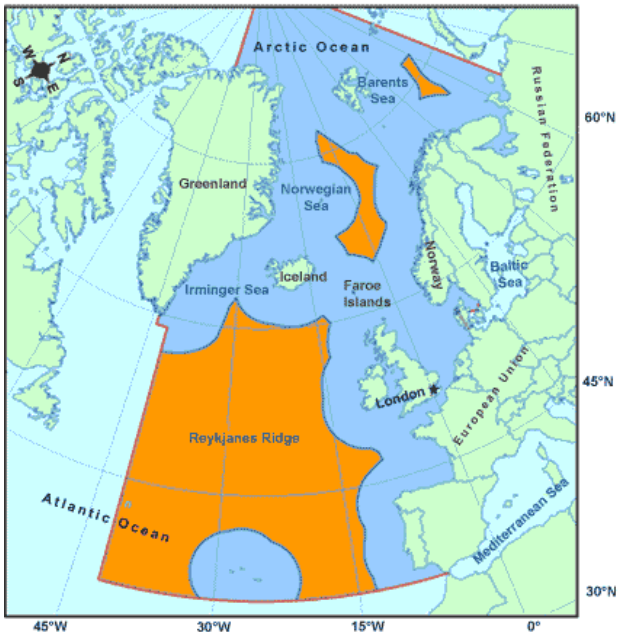
## BOUNDARIES OF REGIONAL FISHERIES BODIES AND INSTRUMENTS

| ORGANISATION | GEOGRAPHICAL AREA COVERED | MAP |
|---|---|---|
| The North Pacific Anadromous Fish Commission (NPAFC) | The area to which this Convention applies, hereinafter referred to as the "Convention Area", shall be the waters of the North Pacific Ocean and its adjacent seas, north of 33 degrees North Latitude beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. It is understood that activities under this Convention, for scientific purposes, may extend farther southward in the North Pacific Ocean and its adjacent seas in areas beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured |  <br>http://www.npafc.org/new/about_conventionarea.html |

| | | |
|---|---|---|
| The Western and Central Pacific Fisheries Commission (WCPFC) | "the Convention Area" comprises all waters of the Pacific Ocean bounded to the south and to the east by the following line:<br><br>From the south coast of Australia due south along the 141° meridian of east longitude to its intersection with the 55° parallel of south latitude; thence due east along the 55° parallel of south latitude to its intersection with the 150° meridian of east longitude; thence due south along the 150° meridian of east longitude to its intersection with the 60°parallel of south latitude; thence due east along the 60 ° parallel of south latitude to its intersection with the 130° meridian of west longitude; thence due north along the 130° meridian of west longitude to its intersection with the 4°<br><br>parallel of south latitude; thence due west along the 4°<br><br>parallel of south latitude to its intersection with the 150°<br><br>meridian of west longitude; thence due north along the 150° meridian of west longitude. |  <br>https://www.wcpfc.int/doc/convention-area-map |
| International Convention for the Conservation of Atlantic Tunas (ICAAT) | The area to which this Convention shall apply, hereinafter referred to as the "Convention area", shall be all waters of the Atlantic Ocean, including the adjacent Seas |  <br>https://www.iccat.int/en/convarea.htm |

| | | |
|---|---|---|
| North Atlantic Marine Mammal Commission (NAMMCO) | The North Atlantic Ocean, without any limits or further description set by the Agreement. |  <br>http://igifl.intlaw.info/orgs/maps/nammco.htm |
| North Atlantic Salmon Conservation Organization (NASCO) | Atlantic Ocean north of 36°N, throughout the species' migratory range.<br><br>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.<br><br>Within areas of fisheries jurisdiction of coastal States, fishing of salmon is prohibited beyond 12 nautical miles from the baselines from which the breadth of the territorial sea is measured, except in the following areas: (a) in the West Greenland Commission area, up to 40 nautical miles from the baselines; and (b) in the North East Atlantic Commission area, within the area of fisheries jurisdiction of the Faroe Islands. |  |

| | | |
|---|---|---|
| | | Map: http://www.fao.org/figis/geoserver/factsheets/rfbs.html |
| The Convention on the Conservation and Management of the Pollock Resources in the Central Bering Sea (CCBSP) | High seas of the Bering Sea beyond 200 nautical miles from the baselines from which the breath of the territorial sea of the coastal States of the Bering Sea is measured. |  <br>Map: http://www.fao.org/figis/geoserver/factsheets/rfbs.html |
| Northwest Atlantic Fisheries Organization | 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<br><br>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. |  <br>Map: http://www.fao.org/figis/geoserver/factsheets/rfbs.html |

| | | |
|---|---|---|
| North East Atlantic Fisheries' Commission (NEAFC) | (1) within those parts of the Atlantic and Arctic Oceans and their dependent seas which lie north of 36° north latitude and between 42° west longitude and 51° east longitude, but excluding:<br>(i) the Baltic Sea and the Belts lying to the south and east of lines drawn from Hasenøre Head to Gniben Point, from Korshage to Spodsbjerg and from Gilbjerg Head to the Kullen. and<br>(ii) the Mediterranean Sea and its dependent seas as . far as the point of intersection of the parallel of 36° latitude and the meridian of 5°36' west longitude<br>(2) within that part of the Atlantic Ocean<br>north of 59° north latitude and between<br>44° west longitude and 42° west longitude |  <br>http://www.neafc.org/page/27 |