



**IUCN/NRDC Workshop on Ecosystem-based Management in the Arctic
Marine Environment**

Workshop Report

Prepared by Thomas L. Laughlin and Lisa Speer

September 18-19, 2011

Reykjavik, Iceland



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http://www.iucn.org/about/work/programmes/marine/marine_our_work/polar_activities/

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1. Introduction

1.1 IUCN/NRDC Project on EbM in the Arctic Marine Environment

Human activity is expanding in the Arctic marine environment. In part, this is a result of the dramatic decrease in summer sea ice coverage. The Arctic Climate Impact Assessment, prepared under the auspices of the Arctic Council, concluded that ocean warming and loss of ice is expected to accelerate, exacerbating the major physical, ecological, social and economic changes already underway in the Arctic marine environment.

Expansion of human activity in the Arctic marine environment will require certain new controls. While the United Nations Convention on Law of the Sea, in conjunction with other international agreements and national laws, provides a general legal foundation, new rules may be necessary to preserve and protect the Arctic marine environment and subsistence use in the face of new or expanded industrial activities. Examples of existing and possible new areas of attention include new standards for Arctic marine shipping, regulation of new or expanding Arctic fisheries, rules to protect the environment in the course of natural resource development, stricter regulation of Arctic tourism, mechanisms to assess and manage the cumulative impacts of multiple activities affecting the same ecosystems, and procedures for the establishment of representative networks of protected marine areas.

Ecosystem-based management has the potential to provide an organizing framework for decision-making about these and other Arctic marine activities. Such an approach, as generally accepted at the international level, includes defining portions of ocean space for integrated management purposes based on oceanographic and ecological criteria, and the development of trans-boundary management arrangements.

At its May 2011 Ministerial Meeting, the Arctic Council expressed interest in building on its existing efforts to develop ecosystem-based management in the Arctic by establishing a Group of Experts.¹ The Arctic Council decided that the Group should focus on both marine and terrestrial ecosystems and called on the Group to:

1. Develop a common understanding of the ecosystem approach
2. Consider principles for management of marine and terrestrial areas and
3. Consider developing Arctic specific guidelines for applying the ecosystem approach in all relevant areas of work of the Arctic Council.

¹ Nuuk Declaration - On the occasion of the Seventh Ministerial Meeting of The Arctic Council 12 May 2011, Nuuk, Greenland.

The International Union for the Conservation of Nature (IUCN) and the Natural Resources Defense Council (NRDC) are undertaking a cooperative project to explore ways of advancing implementation of ecosystem-based management, and to begin the process of identifying specific ecologically significant and vulnerable marine areas that should be considered for enhanced protection in any new management arrangements. Partners in the project have included the Ecologic Institute and the Center for Marine Biodiversity and Conservation (CMBC) at the Scripps Institution of Oceanography, University of California, San Diego.

The main outcomes of the IUCN/NRDC Arctic Marine Ecosystem-Based Management Project will include:

- 1) Scientific findings (including maps and reports) on areas of ecological and biological significance or vulnerability that should be considered for enhanced protection in the Arctic marine environment, and
- 2) Recommendations on management arrangements to advance policy decisions on ecosystem-based marine management in the Arctic region.

1.2 Project Methodology

The project has involved a series of workshops of invited experts. The first workshop explored possible strategies for implementing Ecosystem-based Management (EbM) in the Arctic marine environment. That workshop was held in Washington, D.C. on 16-18 June, 2010.²

A second workshop, held 2-4 November 2010, convened 34 scientists at the Scripps Institution of Oceanography in La Jolla, CA to identify areas of ecological and biological significance or vulnerability that should be considered for enhanced protection in the Arctic marine environment.³

A third workshop, held in Reykjavik, Iceland on 18-19 September, 2011, returned to the topic of EbM. The purpose of the third meeting was to build upon the results of the first workshop, and to help inform the discussion at the first meeting of the Arctic Council Experts Group on EbM. The Reykjavik workshop addressed perceived barriers to EbM, and identified first steps that States might take collaboratively to advance EbM. This report reflects what IUCN and NRDC perceived as the principal findings and outcomes of the discussion at the Reykjavik workshop, and does not necessarily represent the views of any workshop participants. A list of participants and the meeting agenda can be found in Annex 1 and 2.

² The report of the Washington meeting may be found at:

http://cmsdata.iucn.org/downloads/arctic_workshop_report_final.pdf

³ The report of the La Jolla meeting may be found at: <http://data.iucn.org/dbtw-wpd/edocs/Rep-2011-001.pdf>

2. Outcomes of the Reykjavik Workshop

Various terms are used to describe what we call EbM. These include: ecosystem approach, integrated ocean management, marine spatial planning (as a tool to achieve EbM), ecosystem management and others.

For purposes of this project and this report, the following definition of EbM was used. It was developed at the Washington workshop based on a summary review of several national and international instruments prepared for the Washington meeting (attached as Annex 4)

“Comprehensive integrated ecosystems-based management of human activities is based on the best available scientific knowledge about the ecosystem and its dynamics. It identifies and takes action on influences which are critical to the long term health and resilience of marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.”

This definition is very similar to other definitions of EbM. Key themes and components reflected in virtually all such definitions, include:

- a. Application of EbM is geographically-based;
- b. EBM considers the inter-relationship among living and non-living components;
- c. It provides for the assessment and management of cumulative impact of multiple human activities;
- d. EbM is science-based;
- e. Successful EbM is inclusive of rights holders and stakeholders; and
- f. Monitoring, assessment and feedback are key components of EbM, and management approaches are subject to adaptation over time as information grows and conditions change.

2.1 Perceived Barriers

A number of perceived barriers to implementation of marine ecosystem-based management exist. The meeting agenda was structured to address the following:

- a. EbM is not reflected in international law and policy;
- b. EbM is not reflected in the work of the Arctic Council;
- c. EbM is not practiced by the Arctic Council States in their own waters;
- d. EbM is possibly anti-development;
- e. EbM is vague, ill-defined, and hard to do;
- f. EbM may interfere with national sovereignty.

The meeting clarified that there “barriers” are largely without basis. Each is discussed below.

EbM is widely enshrined in International Law and Policy

The concept of marine ecosystem-based management was first reflected in international marine law in the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), adopted in 1980. The Convention includes a definition of “Antarctic marine ecosystem” and a conservation standard against which to measure decisions.

More recently, EbM has been reflected in the 1995 UN Fish Stocks Agreement, which calls on States to assess and manage the effects of fishing, together with other activities, on the ecosystem. The World Summit on Sustainable Development (WSSD) Plan of Implementation (2002) calls for States to undertake marine ecosystem-based management by 2010.

The Convention on Biological Diversity (CBD) adopted the ecosystem approach as a framework for the analysis and implementation of the objectives of the CBD.

Numerous United Nations resolutions on sustainable fisheries and oceans refer to the need for ecosystem approaches. The topic received extensive international consideration at the 2006 session of the United Nations Informal Consultative Process on Oceans and Law of the Sea.

Of importance to several Arctic States, at the regional level, EbM is reflected in the HELCOM/OSPAR⁴ “Statement on the Ecosystem Approach to the Management of Human Activities” (2003).

The Arctic Council has repeatedly and formally embraced EbM

In the Arctic, States have agreed to contribute to the identification of Large Marine Ecosystems (LMEs) through the Arctic Council Working Group on Protection of the Arctic Marine Environment (PAME). The approach is reflected in the Arctic Marine Strategic Plan, adopted at the Arctic Council Ministerial Meeting in Reykjavik in 2004:

“The modern ocean management concept known as ecosystem-based management is the best approach to managing the Arctic marine environment in such a way as to achieve the four goals of the Strategic Plan.”⁵

⁴ Baltic Marine Environment Protection Commission (the Helsinki Commission – HELCOM) and the OSPAR Commission for the Protection of the Marine Environment of the North East Atlantic (OSPAR)

The first Strategic Action to implement this part of the Plan was to identify the LMEs of the Arctic based on the best available ecological information.

In 2006, a map, delineating 17 Arctic LMEs was supported by the Arctic Council Senior Arctic Officials as the LME working map of the Arctic Council.

In 2009, the Arctic Council Ministerial Meeting in Tromso supported a set of Best Practices in Ecosystem-based Ocean Management (BePOMAr), following an extensive 2 year review conducted by PAME. In 2007, PAME established a contact group on ecosystem-based management, focused on the practical application of the approach.

Based on this work, the Arctic Marine Shipping Assessment and the Arctic Oil and Gas Assessment both used LMEs as a basis for their analyses.

Arctic States conduct EbM in their marine waters.

Each of the Arctic States has taken steps to implement EbM within their marine areas, and, in one case, through a transboundary agreement. The Reykjavik workshop included presentations on Russian, Norwegian, Canadian, U.S. and Icelandic EbM programs.

These presentations demonstrated that Arctic states are at different stages of EbM implementation. While difficulties remain, significant progress has been made in all.

Among the best examples of State implementation of marine EbM is in the Norwegian Barents Sea (Barentshavet). Transboundary fisheries arrangements between Norway and Russia have been operative since the 1970s.

The Norwegian EbM Plan was developed through a three phase approach involving scoping, assessment of impacts, and aggregated analysis. The Plan is administered by a Ministerial Steering Group and is implemented by regulations mandated by three acts of Parliament.

The Russian Ministry for Natural Resources and the Environment is currently undertaking a four phase EbM project. Currently, the focus is on defining the existing and future levels of human activity in the Russian Barents Sea. The plan calls for development of an ecosystem-based management plan during 2013.

Transboundary cooperation between Russia and Norway on EbM is through two Joint Commissions - one for the Environment and one for Fisheries. A Joint Norwegian-Russian Status Report for 2008 was published in 2009. The Report is designed to support

⁵ The goals of this Strategic Plan are as follows:

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

management decisions for both the Russian and the Norwegian portions of the Barents Sea.⁶

The Canadian ecosystem-based management approach is based on the Canada Oceans Act of 1996, as elaborated by the Ocean Strategy of 2002 and the Ocean Action Plan of 2005/2007. It entails a six step process from delineation of an ecoregion to monitoring and evaluation. For example, the work conducted in the Beaufort Sea Large Ocean Management Area and is overseen by a Regional Coordination Committee with representation from federal, territorial and Aboriginal governments and management boards. Implementation is supported by extensive assessment work used to identify management options. Canada is now exploring transboundary bilateral and trilateral management options.

The United States commitment to EbM in the Arctic is reflected in U.S. Arctic Policy as set forth in National Security Presidential Directive 66 (2009) and, more generally for all marine areas, in the Interagency Ocean Policy Task Force Executive Order of 2010. The latter includes a strategic plan for EbM in the Arctic.

The most developed operational components of these policies in the Arctic are those designed by the North Pacific Fishery Management Council, including Fishery Ecosystem Plans, an Arctic Fishery Management Plan and measures designed to maintain habitats, protect biodiversity and maintain system sustainability. There is an annual report on ecosystem considerations and a standing ecosystem committee. A key component of the management approach is transparency of process.

Iceland does not have a legal framework for ecosystem-based management, but EbM is reflected in the general strategy of the government. The approach includes integrated management of multiple fisheries and other uses through a holistic approach. As well, it includes the development of a broader set of conservation objectives, both ecosystem and species-related. While in practice, there is a continued focus on single species management, a number of ecosystem considerations are weighed, including discards and non-targeted species, physical components of the area and ecosystem components.

EbM addresses conflicts over development in marine areas.

Ecosystem-based management and the related tool of marine spatial planning are increasingly viewed as appropriate approaches to manage Arctic marine development. It is recognized that a sectoral approach to development is no longer adequate, in part because such an approach does not provide mechanisms for addressing conflicting uses of and impacts on the same ocean space. Attention to cumulative impacts, as well as major forcing functions such as climate change, is needed.

⁶ The electronic version of the full Report is available on the official Portal of the Joint Environment Russian-Norwegian Commission: www.barentsportal.com.

Many of the elements of EbM have become standard operating procedure for industry, as reflected in the examples above. These include monitoring, assessment, scientific research and participatory stakeholder involvement. The workshop concluded that EbM is not anti-development. It is, rather an integrated approach to planning and managing economic development so as to assure systemic health of the ecosystem and economic and environmental sustainability.

Mechanisms to implement EbM are readily available.

The workshop presentations of national and transboundary experience in the Arctic made clear that Arctic States are on the path to marine EbM. The presentations also indicated that undertaking EbM requires a strong scientific base, an extensive, inclusive and transparent management structure, and broad and high level policy support. The presentations also highlighted that states are experimenting with a variety of approaches and techniques and that these techniques are being continually adapted and improved over time.

While States have developed differing institutional mechanisms to implement EbM, in part based on the particular nature of their federal, regional, local and indigenous governance structures, it is clear that there are several core elements that are common to all these efforts.

These core elements include:

1. place-based management;
2. long-term scientific monitoring and assessment;
3. adaptive management;
4. a multi-sectoral approach;
5. consideration of cumulative impacts; and
6. participatory decision-making processes.

These core elements reflect the key themes and components in the definition developed at the Washington workshop. This conclusion suggests the utility of regular consideration of comparative experiences to improve the overall national application of the concept.

EbM is implemented by individual states under their sovereign authority and control

Arctic States are currently practicing or developing marine ecosystem-based management. They are doing so within their national jurisdictions pursuant to appropriate policy level and/or legislative direction. In some cases, Arctic States have or are exploring cooperative transboundary agreements to facilitate the application of EbM for ecosystems that are not confined within the limits of one national jurisdiction. They are doing so on the basis of their own domestic authorities and in pursuit of mutual self interest with partner states.

Arctic States have also supported the inclusion of EbM in a variety of international agreements and policy documents. It is logical to conclude that support for these instruments is consistent with States' concerns about national sovereignty.

These facts suggest that an Arctic regional EbM approach can be designed in a manner consistent with the national sovereignty interests of Arctic States.

2.2 Benefits of a Regional Ecosystem Approach

Arctic States have committed themselves to marine ecosystem-based management at the global and at the Arctic regional levels. Nationally, these States are developing EbM programs. What benefits would accrue if, building on these efforts, Arctic States were to fashion a regional strategy for EbM implementation?

A regional marine EbM strategy has the potential benefit of providing a framework for enhanced cooperation among Arctic States on marine issues. A regional approach could clarify definitions and identify critical core components of EbM.

Working together, States could draw upon the best available scientific information to identify ecosystem units and to design monitoring and assessment programs to support management of these units.

Since management of activities within these ecosystems would be on the basis of national authority, provision could be made for discussion and exchange of information on management experiences over time, strengthening the approach throughout the region.

Joint exploration of these issues would provide an important venue for the participation and contribution of industries active in the Arctic marine development. It could extend to the scientific efforts conducted in support of EbM as well. Periodic scientific symposia would improve understanding of these systems as well as ability to successfully manage human activities in them.

Scientific cooperation could extend to identification and resolution of data compatibility issues (i.e. problematic differences in national scientific or planning standards or protocols that inhibit data sharing).

A regional approach has the additional benefit of enabling collective consideration of major external forcing functions affecting Arctic marine ecosystems, such as persistent organic pollutants and climate change.

Regular published reports reflecting the knowledge gained by application of EbM and through regional dialogue would demonstrate Arctic leadership in the stewardship of marine ecosystems. As well, such reports could be fashioned as the regional contribution to the Regular process for global reporting and assessment of the state of the marine environment, including socioeconomic aspects agreed and called for by the United Nations General Assembly.

Finally, a regional approach would have the benefit of knitting together a range of planned and on-going Arctic Council initiatives. These include, among others, CAFF's Circumpolar Biodiversity Monitoring Program (CBMP) and its Arctic Biodiversity Assessment (ABA); the Sustaining Arctic Observing Networks (SAON), Arctic Data Spatial Infrastructure; the Arctic Ocean Review and the Arctic Change Assessment initiative.

2.3 A Phased Beginning

In moving toward the development of an Arctic marine EbM strategy as envisioned at the Washington workshop (see Annex 3), the view of the Reykjavik workshop was that a phased approach might be advisable.

Three potential phases were identified. Pursuit of the first two phases might actually overlap somewhat in time, while the third phase would follow, once a strategy is in place.

Initial steps include defining EbM and identifying the goals and objectives of its regional implementation.

A second phase would focus on identification of elements that would support an Arctic regional strategy. A number of these elements are already in place or are being pursued. Identification of these components would clarify the full requirements of the approach, including existing elements in place and how they would relate in the context of a regional Arctic EbM framework.

A third phase could involve periodic scientific and management review meetings as States implement EbM in the region.

Such meetings could be designed to exchange best EbM practices and lessons learned. Two areas that may prove of particular interest are transboundary management practices and "co-management" practices and how these two sets of issues interrelate.

Scientific reviews could provide the ability to compare and contrast the links between science and management; track the effects of external forcing functions such as climate change and persistent organic pollutants and study the comparative behavior of similar large marine ecosystems. Such reviews could be used to improve effectiveness of ecosystem-based management in the region.

Annexes

Annex 1 - Participants list

Barry, Tom – Executive Secretary, CAFF International Secretariat

Blaauw, Robert - Business Development Manager Russia and Arctic, Shell International Exploration and Production

Bloom, Evan – Director, Office of Ocean and Polar Affairs, Bureau of Oceans and International Environmental & Scientific Affairs, U.S. Department of State

Burgaard, Maja Sofie – Bureau of Minerals and Petroleum, Government of Greenland

Ehler, Bud – President, Ocean Visions

Eichbaum, Bill - Vice President, Marine and Arctic Policy, WWF-US

Elisenberg, Anja– Adviser, Norwegian Ministry of the Environment

Gavrilo, Maria - Senior Research Scientist, National Park Russian Arctic

Gudmundsdottir, Soffia – PAME Executive Secretary

Hoel, Alf Hakon – Regional Director, Institute of Marine Research, Tromsø

Johannesson, Magnus - Secretary-General, Ministry for the Environment, Iceland

Korneev, Oleg – Deputy Director for Geoecology State Company “Sevmorgeo” (Rosnedra), Head of the Offshore Environment Monitoring Center for Baltic and Arctic Seas

Kurvits, Tiina - Senior Advisor, Ecosystem Management, Polar Programme UNEP/GRID-Arendal

Laughlin, Thomas – Deputy Director, Global Marine and Polar Programme, International Union for the Conservation of Nature (IUCN)

Marlborough, Andrea – Senior Arctic HSE Specialist, Shell International Exploration and Production B.V.

McLanahan, Elizabeth - Acting Deputy Director, Office of International Affairs, NOAA Office of International Affairs

Mengerink, Kathryn – Director, Ocean Program, Environmental Law Institute

Paulic, Jocelyn – Biologist, Arctic Aquatic Research Division, Fisheries and Oceans Canada

Retter, Gunn-Britt - Head of Arctic and Environmental Unit, Saami Council

Sauvé, Renée - Director, Global Fisheries & Marine Governance Bureau, Fisheries and Oceans Canada

Sigurjónsson, Jóhann– Director General Marine Research Institute, Iceland

Skjoldal, Hein Rune - Research Director and Head of Department of Marine Environment, Institute of Marine Research, Norway

Smith, Duane – President, Inuit Circumpolar Council Canada

Speer, Lisa - International Oceans Program Director, Natural Resources Defense Council (NRDC)

Stotts, James – President, Inuit Circumpolar Council Alaska and ICC Vice-Chair

Thomsen, Barbro – Senior adviser, Norwegian Climate and Pollution Agency

Thurston, Dennis - Bureau of Ocean Energy Management, Regulation, and Enforcement

Vanderzwaag, David - Professor of Law, Associate Marine & Environmental Law Institute, Dalhousie University

Vester, Jette – Department of Environment, Ministry of Domestic Affairs, Nature and Environment, Government of Greenland

Wilson, Bill - NOAA, Ret

Yeager, Brooks B. - Executive Vice President for Policy, Clean Air-Cool Planet (CA-CP)

Annex 2 - Agenda

Sunday, September 18

- 8:30-9:00 Registration and Coffee
- 9:00 Welcome and Introduction
Thomas Laughlin & Lisa Speer
- 9:15 EbM in the Arctic
Elizabeth McLanahan
- 9:40 Canada
Jocelyn Paulic
- 10:00 USA
Bill Wilson
- 10:30-11:00 Coffee break
- 11:00 Iceland
Jóhann Sigurjónsson
- 11:30 Assessing changing states and implications for EbM management
Hein Rune Skjodal
- 12:00 Shell
Robert Blaauw
- 12:30 – 1:30 Lunch
- 1:30 Group addresses the question:
How can we work together under the auspices of the Arctic Council to advance collaboration and cooperation on ecosystem based management in the marine environment?
- 3:30 – 4:00 Coffee break
- 4:00 Norway and Russia in the Barents Sea
Oleg Korneev
Alf Hakon Hoel
- 4:30 – 5: 30 Continued group discussion
- 6:00 Reception at the Hotel Hilton Reykjavik

Monday, September 19

- 9:00 Marine Spatial Planning
Bud Ehler
- 9:30 Plenary Reports
Co-chairs: Thomas Laughlin & Lisa Speer
- 10:30-10:50 Coffee break
- 10:50 Group further refines ideas on collaboration and cooperation within the Arctic Council on EBM, and to identify possible next steps.
- 12:00-1:00 Lunch
- 1:00 Final plenary discussion
Co-chairs: Thomas Laughlin & Lisa Speer

Annex 3 - Outcomes of the Washington, D.C. Workshop

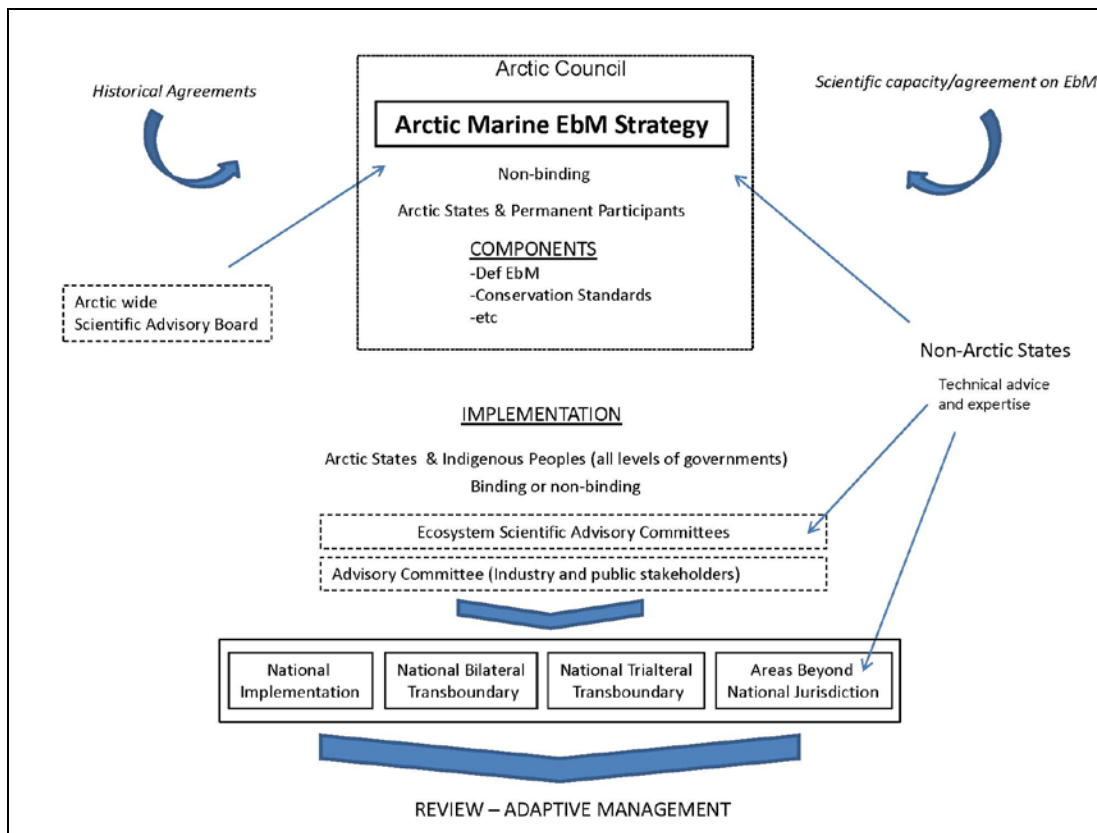
Various factors are likely to affect the Arctic marine environment in the coming decades. While loss of summer sea ice, ocean warming and acidification resulting from global climate change are of significant concern, the focus of this project is principally on activities in the Arctic itself and what might be done to address them from an ecosystem-based management perspective. The principal driving forces are identified as fishing, tourism, shipping, oil and gas development, mineral development and the arrival of invasive species.

There is a lack of international mechanisms to effectively implement integrated, cross-sectoral management with respect to these various activities. Ecosystem-based management could help address that objective.

In examining how best to achieve broad application of EbM, it could be considered whether a binding legal regime would be useful or whether other approaches would be preferable. Several Arctic States have recently adopted new Arctic policies and progress on EbM would have to be consistent with these. These States generally consider that cooperative arrangements are and should be developed through the Arctic Council. Consequently, progress appears more likely in that context. Arctic-wide progress toward EbM is likely to be timelier and to better reflect participation by indigenous peoples by pursuing legally binding solutions. Implementation could then take a legally binding or non-binding form, as needed and appropriate.

The most logical and productive approach would seem to be to build on the history and successes of the Arctic Council with respect to EbM and to suggest the development of an Arctic marine ecosystem-based management strategy or framework, along the lines set forth in Diagram 1 below.

Diagram 1: Arctic Marine EbM Strategy



The diagram depicts a strategic way forward to implement marine ecosystem-based management (EbM) in the Arctic region.

The development of an EbM Strategy is timely and appropriate in light of the history of international discussions at both the global and the Arctic regional levels. Arctic States have agreed to apply EbM to the marine environment in a variety of statements and agreements, and have identified a set of Best Practices to do so. The next logical step is to develop a Strategy for moving forward.

An Arctic Marine EbM Strategy could be envisioned as a non-legally binding document developed under the auspices of the Arctic Council.

A Strategy would apply to the entire Arctic region and would contain a set of general components appropriate to marine EbM in the region (see below).

Implementation of a Strategy would be at the national level, individually, or on a bilateral, trilateral or broader basis, depending on the identified geographical extent of a particular ecosystem. Decision processes would involve participation by indigenous peoples and sub-national governmental units, as appropriate.

Both the development and implementation of a Strategy would be informed by scientific advisory groups and the implementation phase would further be advised by relevant stakeholders.

As well, both phases could benefit from expert technical advice from non-Arctic States, intergovernmental and non-governmental organizations.

A Strategy would provide for review and adaptation, both of the Strategy itself and of the implementation processes.

With respect to the area of application of such a Strategy, the Arctic States should determine this, as they do with all matters related to the Arctic Council.

Components of a Strategy

The following components of a Strategy have been identified:

- 1. Defining Ecosystem-based management (EbM)**
- 2. Conservation Standards**
- 3. Conservation Principles**
- 4. Environmental Impact Assessments and Ecosystem Reporting**
- 5. Provisions on Sound Science**
- 6. Reviewing Implementation**

7. Other

Marine protected areas (MPAs) could serve as a useful tool in combination with environmental management and regulation.

Since EbM is place based, habitat maps are needed for coastal/marine areas. In addition, monitoring areas which are closed to fishing, oil and gas development or other human activity could be an important component of EbM. A portfolio of approaches including MPAs, closed areas, and special regulatory provisions is desirable and should be deployed in a variety of different habitats.

A Strategy should include a provision for participation of all relevant stakeholders (e.g., indigenous peoples, industry, NGOs). Information sharing among Arctic States and outside groups is particularly important.

Marine Spatial Planning should be integral to the EbM process to ensure integrated, cross-sectoral management of all human activities affecting a particular ecosystem. In addition to providing guidance on the planning of *where* activities should and should not take place, a Strategy should provide guidance on whether improvements are needed in *how* such activities are conducted. For example, with respect to oil and gas activities, it would be useful to focus on the key areas of oil spill prevention and

response to identify what regional approaches might be desirable. To enable timely progress in this regard, one or more methods of quickly collecting information on best practices would be useful. This could be done through querying countries on State practice and through requests to industry. Also, the possibility of voluntary or mandatory arrangements within the oil and gas industry or between states and industry has been identified.

A Strategy should be implemented by Arctic States in close cooperation with other organizations where appropriate, for example the IMO with respect to shipping.

A Strategy should include provisions for communication and outreach.

It was noted that an appropriate vehicle for financing the elaboration of a Strategy should be identified.

Annex 4 - Working Definition of Ecosystem-based Management

Inasmuch as the purpose of this workshop is to identify ways forward toward creation of ecosystem-based management (“EBM”) arrangements, the meeting cannot spend a great deal of time on the definition of the concept. Therefore, the following working definition of EBM was developed based on a review of relevant literature, including outcomes of intergovernmental meetings.

Summary

Based on the best available scientific knowledge, EBM considers the inter-relationships among living and non-living components of an ecosystem to coordinate/manage the cumulative impacts of human activity on the ecosystem. Decision makers use EBM to restore or maintain ecosystem integrity.

What does EBM aim to achieve? What are the purposes and results of EBM?

Core

EBM aims to restore or maintain the ecosystem’s integrity. It seeks to maintain the natural structure and function of the ecosystem. [This aim is related to an explicit conservation standard found in most definitions of EBM.]

A second goal of EBM is to achieve sustainable use of the ecosystem and its resources.

EBM attempts to minimize the impact of human activity on ecosystems and its resources.

What factors does EBM take into account? What factors guide decisions? What factors frame the approach?

Core

- EBM manages human activity affecting the ecosystem and recognizes that humans are an integral part of ecosystems.
- EBM is place-based in that management and planning is based on the scope of the ecosystem, rather than on political boundaries. It thus requires defining the ecosystem and its key variables based on ecological criteria. Because ecosystems cross political boundaries and because activity outside the ecosystem may affect the ecosystem, resolution of problems identified by EBM frequently require transboundary coordination and solution, whether the boundary is domestic, regional, or international.
- EBM considers the cumulative impacts on the ecosystem, rather than addressing stressors and uses on an individual, piecemeal basis.
- EBM recognizes complex and fragile relationships among the living and non-living components of the ecosystem. It recognizes that an impact on a single component may have a ripple effect on other components. It therefore attempts to manage the human

impacts on the ecosystem as a whole, rather than any individual component, or sector, unlike traditional sectoral management of species and industries.

- Decisions and plans regarding ecosystem use are grounded in the best available data and scientific knowledge.

Frequently mentioned elements

- EBM recognizes and considers external influences on the ecosystem. For example, development or agricultural activity on land produces runoff that drains into the ocean, affecting a marine ecosystem occurring offshore.
- Where scientific knowledge is deficient or inconclusive, EBM employs the precautionary approach. Decision makers who apply the precautionary approach do not let scientific uncertainty prevent them from enacting protections or allowing use of the ecosystem. Decision makers weigh both the degree of uncertainty and the risk of harm.
- EBM balances and makes tradeoffs among environmental, social, and economic objectives.
- EBM is based on not only natural science, but also social science.

What does EBM value and prioritize?

Core

- EBM values ecosystem services, or the benefits that ecosystems confer on humans. Such services include provisioning, regulating, cultural, and supporting services.

Frequently mentioned elements

- EBM explicitly values biodiversity – species diversity, genetic diversity, and ecosystem diversity.

How is EBM implemented to reach its goals? What are the key aspects of the management approach?

Frequently mentioned elements

- Management is adaptive. Decision makers monitor indicators to determine whether the management strategies are having their intended effect. They respond to new data and scientific understanding by modifying their plan.
- Implementation of EBM requires monitoring, assessment, and feedback.
- It takes a long-term perspective on managing the ecosystem.

- It is frequently inclusive in that it encourages stakeholder participation in planning and implementation.

Sources

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- CCAMLR, art. II
- UNEP & GPA, Ecosystem-Based Management: Markers for Assessing Progress
- CBD, Conference of the Parties 5, Decision V/6, “Ecosystem Approach”
- FAO, biodiversity section website on Ecosystems
- COMPASS: Scientific Consensus Statement on Marine Ecosystem-Based Management (2005)
- U.S. Commission on Ocean Policy, An Ocean Blueprint for the 21st Century
- NOAA: “Why an Ecosystem Approach to Management (EAM)?”
- Environmental Law Institute, Ocean and Coastal Ecosystem-Based Management Implementation Handbook
- WWF International, “Ecosystem-Based Management in Multilateral Environmental Agreements: Progress towards Adopting the Ecosystem Approach in the International Management of Living Marine Resources”

Annex 5 - Principal Obligations under International Law

Current and projected climate change, particularly the projected decrease in sea-ice extent and thickness, threatens the stability of the Arctic coastal and marine environment and will result in enlarged access to the open ocean and surrounding coastal areas. Increased traffic and physical disturbance due to activities in the shipping, oil and gas, mineral exploitation, fishing and tourism sectors may pose a significant threat to coastal and marine biodiversity.

The variety of anticipated human activities and impacts in the Arctic marine environment and lack of focused legally binding agreements may require new arrangements. There are several Arctic-specific agreements and arrangements, the most specific of which is the Arctic Council which was established as a high level intergovernmental forum to provide a means for promoting cooperation, coordination and interaction among the Arctic States, with the involvement of the Arctic Indigenous communities and other Arctic inhabitants on common Arctic issues, in particular issues of sustainable development and environmental protection in the Arctic. The Arctic Council has coordinated policy with respect of the Arctic environment and is in the process of developing an agreement on Search and Rescue that will likely be adopted as binding on Parties to this agreement.

There are other regional arrangements that apply in the Arctic and are of significance. For example, a Code of Arctic Shipping has been developed through the IMO and is subject now to review. The International Association of Classification Societies (IASC) has developed classifications for levels of ice-strengthened vessels of relevance to Arctic shipping.

There are a number of global agreements that apply to the Arctic and are of particular interest to the management of human activities in the Arctic.

The United Nations Convention on Law of the Sea provides a general legal framework for managing the oceans. Its provisions are given effect in part through complimentary agreements and arrangements. For example, under UNCLOS States have an obligation to protect and preserve the marine environment (art 192). They have obligations within their EEZ to ensure that through proper conservation and management measures living resources are not overexploited and that the populations of harvested species are maintained or restored to healthy levels (art 61). States shall cooperate, as appropriate, on a regional basis (art 197). On the high seas, they have an obligation to cooperate for the conservation and management of living resources (art 118). States are to monitor and assess the risks and effects of marine pollution (art 204) and to assess the potential effects of planned activities that may cause substantial pollution or significant harm to the marine environment (art 206). They are to adopt laws and regulations to reduce and control land-based sources of marine pollution and to work together towards global and regional rules, standards and practices to this end (art 207). States are to adopt laws and regulations to reduce and control marine pollution from seabed activities and to work together towards global and regional rules, standards and practices to this end (art 208). They are to work to prevent,

reduce and control marine pollution through dumping (art 210) and to prevent, reduce and control pollution of the marine environment from vessels (art 211). They have the right, subject to certain restrictions, to adopt and enforce non-discriminatory laws and regulations to reduce and control marine pollution in their EEZs in ice-covered areas (art 234). Many of these obligations are to be discharged through competent international organizations, thus for example the prevention, reduction and control of pollution from vessels is effected through agreements and arrangements developed at meetings of the International Maritime Organization.

Various IMO agreements apply in the Arctic, for example:

- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL) and its six annexes:
 - Annex I: Prevention of pollution by oil
 - Annex II: Control of pollution by noxious liquid substances
 - Annex III: Prevention of pollution by harmful substances in packaged form
 - Annex IV: Prevention of pollution by sewage from ships
 - Annex V: Prevention of pollution by garbage from ships
 - Annex VI: Prevention of Air Pollution from Ships
- It is on the basis of MARPOL that Special Areas may be designated by the IMO. Particularly Sensitive Sea Areas also depend in part on MARPOL.
- International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990
 - The Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances (HNS Protocol), 2000
 - International Convention for the Safety of Life at Sea (SOLAS), 1974
 - International Convention on Maritime Search and Rescue (SAR Convention)
 - Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs) which allows *inter alia* for traffic separation schemes
 - International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
 - International Convention on the Control of Harmful Anti-fouling Systems on Ships
 - International Convention for the Control and Management of Ships' Ballast Water and Sediments (not in force at this time)

Also applicable to the Arctic and administered through the IMO are the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (the London Convention) and the 1996 London Protocol with respect of Dumping.

Other global instruments that apply with respect of the Arctic, though some Arctic states are not at this time Party to each of these instruments, include:

- The United Nations Framework Convention on Climate Change, together with the Kyoto Protocol
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora
- The Convention on Biological Diversity
- The Convention on the Conservation of Migratory Species of Wild Animals
- UN Fish Stocks Agreement
- FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas
- Stockholm Convention on Persistent Organic Pollutants
- Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
- [Proposed Mercury Convention]

Some global policies that have application in the Arctic include:

- Agenda 21, which provides *inter alia* for an integrated policy and decision-making process, including all involved sectors, to promote compatibility and a balance of uses; applying a precautionary approach, including prior assessment and systematic observation of the impacts of major projects; and access to the public to relevant information and opportunities for consultation and participation in planning and decision-making at appropriate levels;
- Johannesburg Plan of Implementation which *inter alia* refers to integrated management and sustainable development of coastal areas, including exclusive economic zones; encourages the application of the ecosystem approach; and promotes integrated, multidisciplinary and multisectoral coastal and ocean management at the national level;
- Global Programme of Action for the Protection of the Marine Environment from Land-based Activities
- Regular Process for the Global Reporting and Assessment of the State of the Marine Environment, including Socio-economic Aspects
- United Nations General Assembly resolutions on Sustainable Fisheries and on Oceans and Law of the Sea and related topics

There are a number of regional conventions or arrangements that apply in the Arctic. Other regional agreements that are applicable to at least part of the Arctic include:

- Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)
- Convention on Future Multilateral Co-operation in the North East Atlantic Fisheries (NEAFC)
- Convention for the International Council for the Exploration of the Sea (ICES)

All Arctic states also participate in the United Nations Economic Commission for Europe and are thus involved with several important regional agreements, though they are not at this time all Party to them. Most of these agreements are of interest to the protection of the marine environment and include:

- Convention on Long-range Transboundary Air Pollution (LRTAP) and its protocols (not all Arctic states are bound by all protocols):
 - The 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone; 25 Parties. Entered into force on 17 May 2005.
 - The 1998 Protocol on Persistent Organic Pollutants (POPs); 29 Parties. Entered into force on 23 October 2003.
 - The 1998 Protocol on Heavy Metals; 29 Parties. Entered into force on 29 December 2003.
 - The 1994 Protocol on Further Reduction of Sulphur Emissions; 29 Parties. Entered into force 5 August 1998.
 - The 1991 Protocol concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes; 24 Parties. Entered into force 29 September 1997.
 - The 1988 Protocol concerning the Control of Nitrogen Oxides or their Transboundary Fluxes; 34 Parties. Entered into force 14 February 1991.
 - The 1985 Protocol on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent; 25 Parties. Entered into force 2 September 1987.
 - The 1984 Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP); 43 Parties. Entered into force 28 January 1988.
- Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) with the:
 - Protocol on Strategic Environmental Assessment (SEA or Kiev Protocol)
- Convention on the Protection and Use of Transboundary Watercourses and International Lakes (this is focused on freshwater)
- Convention on the Transboundary Effects of Industrial Accidents
- Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) together with
 - The Protocol on Pollutant Release and Transfer Registers to the UNECE Aarhus Convention

Annex 6 – FAO Definition of Significant Adverse Impacts

(FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas. Rome/Roma, FAO. 2009. 73p.)

17. Significant adverse impacts are those that compromise ecosystem integrity (i.e. ecosystem structure or function) in a manner that: (i) impairs the ability of affected populations to replace themselves; (ii) degrades the long-term natural productivity of habitats; or (iii) causes, on more than a temporary basis, significant loss of species richness, habitat or community types. Impacts should be evaluated individually, in combination and cumulatively.

18. When determining the scale and significance of an impact, the following six factors should be considered:

- i. the intensity or severity of the impact at the specific site being affected;
- ii. the spatial extent of the impact relative to the availability of the habitat type affected;
- iii. the sensitivity/vulnerability of the ecosystem to the impact;
- iv. the ability of an ecosystem to recover from harm, and the rate of such recovery;
- v. the extent to which ecosystem functions may be altered by the impact; and
- vi. the timing and duration of the impact relative to the period in which a species needs the habitat during one or more of its life- history stages.

19. Temporary impacts are those that are limited in duration and that allow the particular ecosystem to recover over an acceptable time frame. Such time frames should be decided on a case-by-case basis and should be in the order of 5-20 years, taking into account the specific features of the populations and ecosystems.

20. In determining whether an impact is temporary, both the duration and the frequency at which an impact is repeated should be considered. If the interval between the expected disturbance of a habitat is shorter than the recovery time, the impact should be considered more than temporary. In circumstances of limited information, States and RFMO/As should apply the precautionary approach in their determinations regarding the nature and duration of impacts.



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