



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

# **Workshop Report**

**June 16-18, 2010**

**Washington, D.C.**



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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 in the face of new or expanded industrial activities. Examples of possible 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 Arctic marine activities. Such an approach, as generally accepted at the international level, includes defining portions of ocean space for management purposes based on oceanographic and ecological criteria, and the development of trans-boundary management arrangements.

A key element of ecosystem-based management is identification of ecologically significant or vulnerable areas that may require enhanced protection. New tools are now at hand to assist in defining important and vulnerable portions of ocean space. These include criteria adopted by the Convention on Biological Diversity (CBD) for identifying ecologically and biologically significant areas in the open ocean and deep sea in need of protection, and the 2008 FAO Technical Guidelines for the Management of Deep Sea Fisheries in the High Seas. New information and data stemming from the International Polar Year are now available to inform the application of these tools.

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 include 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 goals will be achieved through a series of workshops of invited experts. The first workshop, focused on ecosystem based management, was held in Washington, D.C. on 16-18 June, 2010. The meeting agenda, list of participants and other meeting papers are attached as annexes to this report. The workshop considered a series of questions related to how States might cooperate on a regional basis to manage and protect the marine environment through application of marine ecosystem-based management approaches. The list of questions considered may be found at Annex 2. Views expressed at the workshop were not for attribution, with the meeting understanding that this report would reflect the view of IUCN and NRDC, as to the views expressed by participants.

The second part of the project, to identify and map areas of ecological and biological significance, will be the subject of an expert workshop in November 2010.

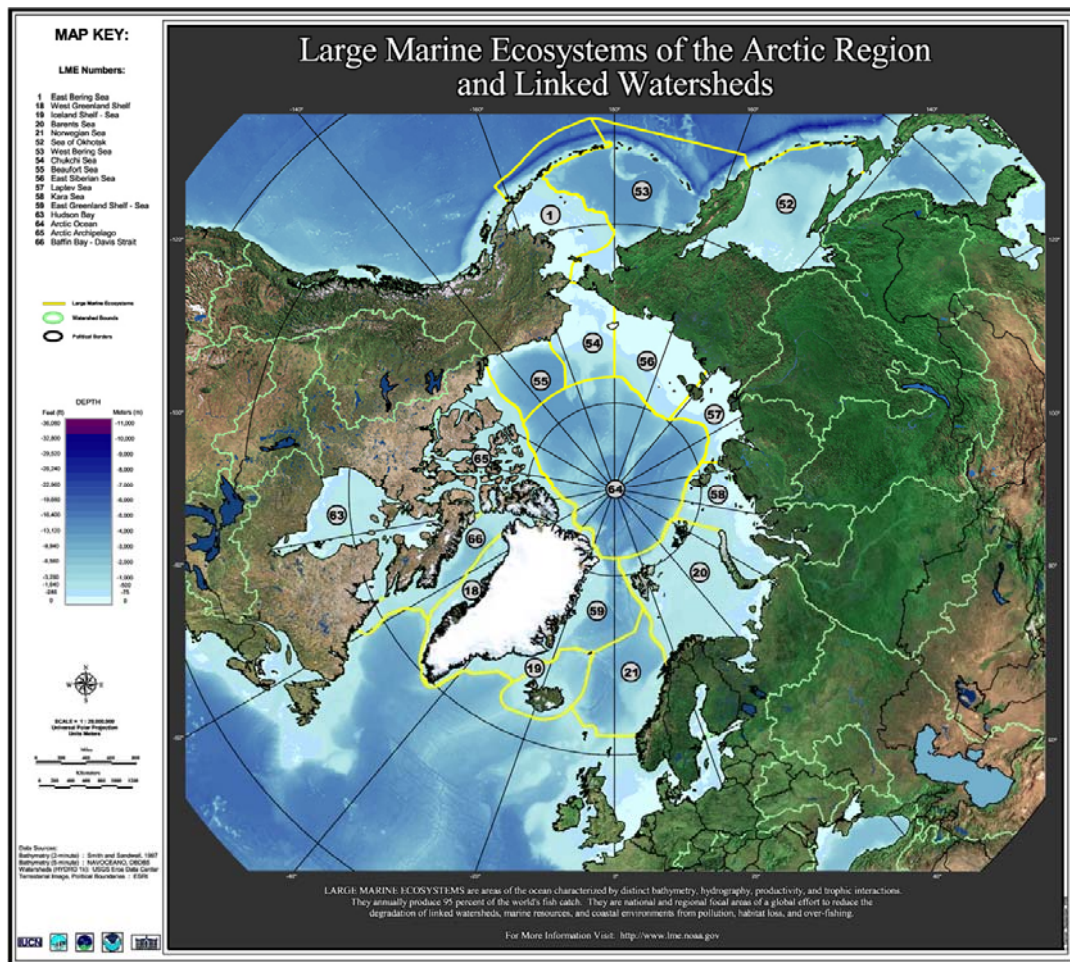
## **2. Background**

Marine ecosystem-based management (EbM) has been supported as a goal by the Arctic States at the global, Arctic, and individual State levels.

All the eight Arctic States have agreed to one or more of the following global agreements and resolutions that call for ecosystem-based management or ecosystem approaches:

- a. The World Summit on Sustainable Development Plan of Implementation (2002) calls for States to undertake marine ecosystem based management by 2010;
- b. The 1995 UN Fish Stocks Agreement, which calls on States to assess and manage the effects of fishing and other activities on ecosystems;
- c. The Convention on Biological Diversity, which adopted the ecosystem approach as a framework for the analysis and implementation of the objectives of the CBD;
- d. Numerous United Nations resolutions on sustainable fisheries and oceans refer to the need for ecosystem approaches.

At the Arctic regional level, the Arctic States agreed to contribute to the identification of Large Marine Ecosystems (LMEs) of the Arctic through the Arctic Council Working Group on the Protection of the Arctic Marine Environment (PAME) as set forth in the Arctic Marine Strategic Plan, adopted at the AC Ministerial Meeting in Reykjavik in 2004. In 2006, a map delineating 17 Arctic Large Marine Ecosystems 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 Tromsø adopted a set of Best Practices in Ecosystem-based Oceans Management (BePOMAr)<sup>1</sup>. PAME has established a contact group on ecosystem-based management focused on the further development and implementation of the approach. The Arctic Marine Shipping Assessment, released by PAME in 2009, and the Arctic Oil and Gas Assessment, released by AMAP in 2008, both used the Large Marine Ecosystem map as a basis for their analyses.



[http://www.pame.is/images/stories/Ecosystem\\_Approach/17-Arctic-LMEs-2006-new-version.jpg](http://www.pame.is/images/stories/Ecosystem_Approach/17-Arctic-LMEs-2006-new-version.jpg)

<sup>1</sup> Observed Best Practices reproduced at pp.110-112 In: Hoel, H.A., 2009. Best Practices in Ecosystem-based Oceans Management in the Arctic. Report No. 129 of the Norwegian Polar Institute, Polar Environmental Centre. <http://portal.sdwg.org/media.php?mid=1017>

Individually, all the Arctic States have taken steps to implement EbM within their marine areas. Perhaps the best example of this in the Arctic Ocean is in the Norwegian Barents Sea (Barentshavet). This plan is supplemented by a transboundary fisheries agreement between Norway and Russia. A 2009 report by the Norwegian Polar Institute documented the important progress made by Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia and the United States in implementing ecosystem approaches to oceans management<sup>2</sup>. Thus, Arctic States have been global leaders in the development and application of marine ecosystem-based management approaches. The challenge now is to identify how this progress can be enhanced within the Arctic Council.

### **3. Workshop Outcomes**

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.

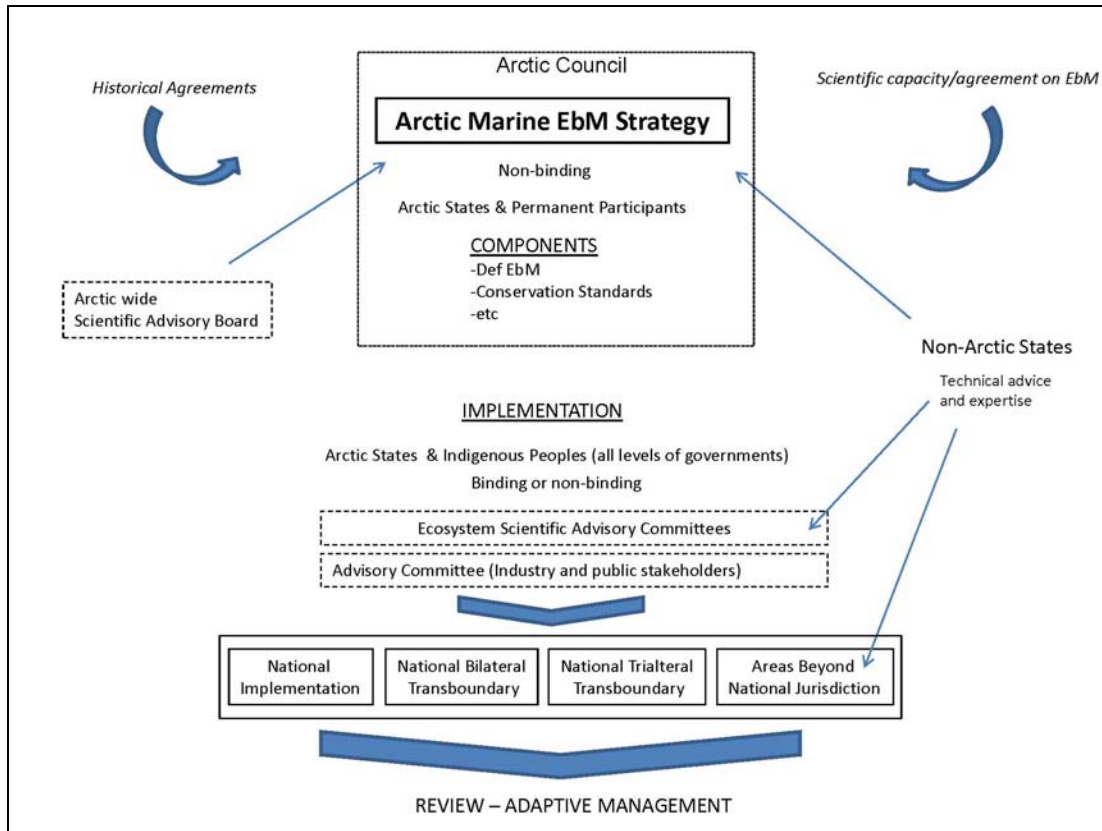
In examining how best to achieve broad application of EbM, it could be considered whether a binding legal regime would be useful or whether other approaches would be preferable. Several Arctic States have recently adopted new Arctic policies and progress on EbM would have to be consistent with these. 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 non-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.

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<sup>2</sup> Hoel, H.A., 2009. Best Practices in Ecosystem-based Oceans Management in the Arctic. Report No. 129 of the Norwegian Polar Institute, Polar Environmental Centre.  
<http://portal.sdwg.org/media.php?mid=1017>

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 Section 3.1 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. The Large Marine Ecosystem map produced by the Council would provide a useful basis for discussion (see page 5).

### **3.1 Components of a Strategy**

The following components of a Strategy have been identified:

#### **1. Defining Ecosystem-based management (EbM)**

A common understanding of the definition of EbM would facilitate discussions. The definition circulated in advance of the workshop went far in meeting that objective (see Annex 5), although some difficulties associated with the practical application of such a definition were noted. The definition could be tailored to specific conditions while maintaining ecosystem integrity and managing human activities.

This might be accomplished with the following definition:

*“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.”*

#### **2. Conservation Standards**

Standards by which to judge whether activities should be permitted should be included in a Strategy. The FAO definition of ‘Significant Adverse Impacts’ under its International Guidelines for the Management of Deep-Sea Fisheries in the High Seas (see Annex 7), though limited in scope, could have larger utility in the context of Arctic marine protection generally. However, that part of the FAO definition pertaining to “temporary impacts” might need further development. It would also be useful to develop further definitions of ‘significant,’ ‘adverse’ and ‘impacts’; and specific standards on long term resilience of the Arctic.



### **3. Conservation Principles**

A Strategy should include principles. A number of examples can be cited such as Guiding Principles found in the Convention on Biological Diversity (CBD); UN Fish Stocks Agreement; Arctic Council Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities; and other agreed documents on marine protection. The principles included in a Strategy should take into account the unique conditions found in the Arctic environment. Common definitions, indigenous rights, and cooperation/communication should be integral parts of the guiding principles of a Strategy.

### **4. Environmental Impact Assessments and Ecosystem Reporting**

Periodic assessments and reporting should be included in a Strategy. EIAs should be standard, should address cumulative effects, and be incorporated into a 'State of the Environment' report. There are different views on whether there should be a uniform approach to assessments/reporting given the different reporting mechanisms in place in various countries. Reporting needs to be as close to real time as possible to capture rapid environmental changes and to inform management. This would require management to be flexible and adaptive.

It was also noted that the Law of the Sea Convention's environmental impact assessment provisions may be inadequate for the purposes of marine protection in the Arctic and that it may be desirable to incorporate in a Strategy certain important elements missing from Article 206 of the LOS Convention. For example, the broad wording of Article 206 does not provide concrete guidance on when or how to conduct an assessment. In addition, the article does not establish procedures for initial screening, documentation or public participation, or for interstate notification, information exchange, and consultation.

### **5. Provisions on Sound Science**

A science advisory group would help ensure a strong scientific basis for EbM decision-making. Such an Arctic science group could be placed within an organization such as IASC, ICES or PICES, or could be part of the Arctic Council. It should be comprised of independent scientific experts from Arctic states and work in cooperation with experts from other states with a substantial competence in Arctic science. This group would give advice to governments on management decisions for future activities and serve as reviewers of existing activities. There is a need for a Strategy to ensure sharing of data within the science group; and it would be beneficial to establish a clearing house for marine Arctic data that is accessible to all.

## 6. Reviewing Implementation

In general, there would be need for two types of reporting: scientific reporting relating to ecosystem health; and reporting on the effective implementation of a Strategy by Arctic States. Environmental reporting should be periodic and cumulative. Reviews of implementation should be done on a regular basis (every 2 years) with the assistance of an independent advisory board.

## 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.

### 3.2 Additional Points

In addition to the process described above, the possible utility of developing one or more ecosystem-based pilot initiatives could be considered. A possible geographical location could be the highly productive and sensitive area north and south of the Bering Strait.

The Bering Strait is a narrow international strait that connects the North Pacific Ocean's Bering Sea to the Arctic Ocean. At its narrowest point, the strait is just 90km wide. The region is highly productive ecologically and extensively used by creatures migrating between the Pacific and the Arctic Oceans, including entire world populations of some species such as spectacled eiders. The Strait conveys water-laden nutrients and larval fish and crustaceans from the Bering Sea into the Arctic via the Chukchi Sea, possibly an important pathway for recruitment of fish species harvested by local residents. The coastline of the Bering Strait region is rich archaeologically and has been continually occupied by indigenous peoples, who have depended on marine mammals, fish, birds, macro algae, shellfish and other invertebrates for thousands of years.

Oil and gas development has been proposed in the past for part of the Bering Strait region. In addition, as the choke point for marine traffic in and out of the Arctic Ocean on the Pacific side, ship traffic is likely to increase. Such traffic poses a variety of risks to marine resources in the region, including ship noise, strikes, entanglements, invasive species, routine pollution and the potential for a major petroleum spill. No formally established vessel routing measures in the Bering Strait region exist, nor are there adequate communications, navigation or incident response capability in the region.

Other suggestions for possible locations of pilot initiatives were the Barents Sea, Baffin Bay, and the Beaufort Sea.

With respect to the high seas, several ideas could be explored. These include agreement on a ban on commercial fishing until a management regime is in place; creation of a science reserve; consideration of the appropriateness of creation of PSSAs or Special Areas under the auspices of the IMO; expanding arctic observing networks and capabilities and requiring application of environmental impact assessment procedures with respect to activities.

## **Glossary**

CBD	Convention on Biological Diversity
EbM	Ecosystem-based management
FAO	Food and Agricultural Organization
IASC	International Arctic Science Committee
ICES	International Council for the Exploration of the Sea
IMO	International Maritime Organization
LME	Large Marine Ecosystem
MPA	Marine Protected Area
PAME	Protection for the Arctic Environment working group
PICES	North Pacific Marine Science Organization
PSSA	Particularly Sensitive Sea Area

## Annexes

### Annex 1 - Participants list

Balton, David A. - Deputy Assistant Secretary, Bureau of Oceans and International Environmental and Scientific Affairs U.S. State Department

Blaauw, Robert J. – Business Development Manager Russia and Arctic, Shell International Exploration and Production

Brigham, Lawson - Distinguished Professor, Geography and Arctic Policy, University of Alaska Fairbanks

Cohen, Harlan – International Union for the Conservation of Nature (IUCN)

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

Funston, Bernie - Executive Director, Sustainable Development Working Group Secretariat, Canada

Gofman, Victoria - Executive Director, Aleut International Association

Golitsyn, Vladimir – Judge, International Tribunal for the Law of the Sea

Jackson, Jeremy – Director Center for Marine Biodiversity and Conservation, Scripps Institution of Oceanography

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

Kraemer, Andreas – Director, Ecologic Institute

Laughlin, Thomas – International Union for the Conservation of Nature (IUCN)

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

Odmark, Helena - Ambassador, Senior Arctic Official of Sweden, Ministry for Foreign Affairs

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

Roots, Ernest Frederick, Science Advisor Emeritus, Environment Canada, Ottawa

Sauvé, Renée – Director, Global Fisheries & Marine Governance Bureau, Department of Fisheries and Oceans, Canada

Sielen, Alan – Senior Fellow for International Environmental Policy, Center for Marine Biodiversity and Conservation, Scripps Institution of Oceanography

Skjoldal, Hein Rune – Institute of Marine Research, Norway

Speer, Lisa – International Oceans Program Director, NRDC

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

Wilson, Bill – NOAA, Ret

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

**Support Staff:**

Caitlyn Toropova – Senior MPA Officer, IUCN

Dorothee Herr – Marine Program Officer, IUCN

Vivian Lam – Marine Research Fellow, IUCN

Frances Douglas – Research Fellow IUCN

Jemma Aitken – Marine Research Fellow, IUCN

Elena von Sperber – Transatlantic Fellow, Ecologic Institute

## **Annex 2 - Questions to Guide Discussion**

**Principal Question and Challenge: As human activities in the Arctic increase, how might States cooperate on a regional basis to protect the marine environment through application of marine ecosystem-based management approaches?**

1. What are the principal obligations under international law?
2. What mechanisms exist to fulfill these obligations?
3. Are there gaps in these mechanisms? If so, what gaps?
4. How well are existing mechanisms working?
5. What mechanisms could fill these gaps?
  - Arctic-wide agreements?
  - Sub-regional agreements?
  - National implementation?
  - Scientific arrangements?
  - Other?
6. What about areas beyond the limits of national jurisdiction?

### ***Breakout Group #1***

7. What might such mechanisms include or refer to?
  - a. Definition of Ecosystem-Based management?
  - b. Conservation standard? (e.g. FAO Guideline definition of significant adverse impacts)
  - c. Principles?
  - d. Effective implementation – e.g. reporting and periodic meeting commitments?
  - e. Compliance or independent review provisions?
  - f. Indicators of change?
  - g. Monitoring provisions?
  - h. EIA provisions?
  - i. Provisions to ensure decisions are made on the basis of sound science?
  - j. Other?

### ***Breakout Group #2***

8. What should be the area of application?
9. Should the mechanism(s) be binding or non-binding?
10. Should there be a science advisory group? If so, with what remit?
11. What should be the role of indigenous groups in any new arrangement(s)?
12. What should be the role of non-Arctic States in any new arrangement(s)?
13. What should be the role of sub-national governments in any new arrangement(s)?
14. What value is added by new regional approaches as opposed to reliance on implementation of national law/policy by individual States?

15. How do we ensure that new regional approaches/mechanism(s) do not devolve to lowest common denominator solutions?
16. Should new approaches/mechanisms ensure that States may take more stringent measures than those found in the new regional mechanism, if necessary, and under certain conditions?

**Plenary**

17. How might the mechanism(s) be developed?  
Under the auspices of the Arctic Council?  
Other?
18. Who would participate in the development of the mechanism(s)? How do the issues of transparency, efficiency and effectiveness affect the decision?



### **Annex 3 - Agenda**

#### **Wednesday, June 16**

9:00am	Introduction
10:45am	Coffee break
11:00am	Workshop resumes
12:30pm	Lunch will be served outside the workshop room
1:15pm	Workshop resumes
3:30pm	Coffee break
4:00pm	Workshop resumes
5:00pm	End of workshop
5:30 pm	Welcoming reception at the Restaurant Tuscan West

#### **Thursday, June 17**

9:00am	Workshop convenes in plenary
9:15am	Start of workshop in breakout groups
	Breakout Group #1 will be chaired by Magnús Jóhannesson
	Breakout Group #2 will be chaired by Bernard Funston
10:30am	Coffee break
10:45am	Workshop resumes in breakout groups
12:30pm	Lunch will be served outside the workshop room
1:15pm	Workshop resumes in breakout groups
3:30pm	Coffee break
4pm	Workshop resumes in plenary / report by the chairs of the breakout groups / consideration of final questions
5:00pm	End for the day

#### **Friday, June 18**

9:00am	Consideration of final questions continued
10:30am	Coffee break
11:00am	Presentation of summary of discussion
1:00pm	End of workshop

## Annex 4 - Breakout Groups

<b>Breakout Group #1</b>	
Chair: Magnus Johannesson	
Rapporteur: Alan Sielan	
Blaauw	Robert
Eichbaum	Bill
Jackson	Jeremy
McLanahan	Elizabeth
Roots	Ernest Frederick
Sauvé	Renée
Skjoldal	Hein Rune
Wilson	Bill

<b>Breakout Group #2</b>	
Chair: Bernie Funston	
Rapporteur: Harlan Cohen	
Balton	David
Brigham	Lawson
Gofman	Victoria
Golitsyn	Vladimir
Kraemer	Andreas
Odmark	Helena
Retter	Gunn-Britt
Speer	Lisa
Vanderzwaag	David
Yeager	Brooks

## **Annex 5 - 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**

- OSPAR/HELCOM: “Statement on the Ecosystem Approach to the Management of Human Activities,” First Joint Ministerial Meeting of the Helsinki and OSPAR Commission (JMM), Bremen, June 25-26, 2003.
- ICP: Letter Dated 14 July 2006 From the Co-Chairpersons of the Consultative Process Addressed to the President of the General Assembly, Report on the Work of the United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea at its seventh meeting, A/61/156, ¶ 6
- Hoel, Norwegian Polar Institute, Best Practices in Ecosystem-Based Oceans Management in the Arctic (BePOMAr): core elements, and Canadian definition
- Arctic Council, Arctic Marine Strategic Plan
- PAME, Progress Report on the Ecosystem Approach to Arctic Marine Assessment and Management (2006-2008)
- 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 6 - 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 7 – 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.