

ECOSYSTEM APPROACH TO MANAGEMENT

2019-2021 PROGRESS REPORT

MAY 2021



ARCTIC COUNCIL

| PAME

Protection of the Arctic Marine Environment

ECOSYSTEM APPROACH TO MANAGEMENT

PROGRESS REPORT
2019-2021

JOINT GROUP OF EXPERTS
ON THE ECOSYSTEM
APPROACH TO
MANAGEMENT

MAY 2021

Prepared by:

*Lis Lindal Jørgensen, Institute of
Marine Research, Norway*

*Elizabeth Logerwell, Alaska
Fisheries Science Center, National
Marine Fisheries Service, NOAA,
USA*

Images: GettyImages

Table of Contents

BACKGROUND	3
DESCRIPTION OF 2019-2021 PROJECTS AND ACTIVITIES	3
1. THE 2 ND INTERNATIONAL SCIENCE AND POLICY CONFERENCE ON IMPLEMENTATION OF THE ECOSYSTEM APPROACH TO MANAGEMENT IN THE ARCTIC	3
2. THE 7 TH EA WORKSHOP ON ELEMENT NO. 5 OF THE EA FRAMEWORK, 'VALUE THE CULTURAL, SOCIAL, AND ECONOMIC GOODS AND SERVICES PRODUCED BY THE ECOSYSTEMS'	3
3. REPORT ON DEVELOPMENT IN DEFINING OR SETTING ECOLOGICAL OBJECTIVES	4
4. THE JOINT ICES/PICES/PAME WORKING GROUP FOR INTEGRATED ECOSYSTEM ASSESSMENT OF THE CENTRAL ARCTIC OCEAN (WGICA).....	4
5. STRENGTHEN THE COMMUNICATION BETWEEN THE EA EXPERT GROUP CO-CHAIRS AND RELEVANT WORKING GROUPS IN THE AC.....	4
PROGRESS ON 2019-2021 PROJECTS/ACTIVITIES	5
1. THE 2 ND INTERNATIONAL SCIENCE AND POLICY CONFERENCE ON IMPLEMENTATION OF THE ECOSYSTEM APPROACH TO MANAGEMENT IN THE ARCTIC	5
2. THE 7 TH EA WORKSHOP ON ELEMENT NO. 5 OF THE EA FRAMEWORK, 'VALUE THE CULTURAL, SOCIAL, AND ECONOMIC GOODS AND SERVICES PRODUCED BY THE ECOSYSTEMS'	8
3. REPORT ON DEVELOPMENT IN DEFINING OR SETTING ECOLOGICAL OBJECTIVES	8
4. THE JOINT ICES/PICES/PAME WORKING GROUP FOR INTEGRATED ECOSYSTEM ASSESSMENT OF THE CENTRAL ARCTIC OCEAN (WGICA).....	9
<i>Executive summary for 2020.....</i>	<i>9</i>
<i>Annual Reports (Interim Reports)</i>	<i>10</i>
<i>Final Reports</i>	<i>10</i>
<i>Planned activities 2020-2024:.....</i>	<i>10</i>
5. STRENGTHEN THE COMMUNICATION BETWEEN THE EA EXPERT GROUP CO-CHAIRS AND RELEVANT WORKING GROUPS IN THE AC.....	10
<i>Update 2021:</i>	<i>11</i>
ANNEX 1 – EA WORK PLAN 2021-2023	12
1. 7 TH EA WORKSHOP ON VALUES AND VALUATION OF THE CULTURAL, SOCIAL AND ECONOMIC GOODS AND SERVICES PRODUCED BY THE ECOSYSTEMS	12
2. THIRD INTERNATIONAL SCIENCE AND POLICY CONFERENCE ON IMPLEMENTATION OF THE ECOSYSTEM APPROACH TO MANAGEMENT IN THE ARCTIC	12
3. INTEGRATED ECOSYSTEM ASSESSMENT (IEA) OF THE CENTRAL ARCTIC OCEAN (WGICA)	13
4. REVISE THE ECOSYSTEM APPROACH FRAMEWORK (EA) AND DEVELOP A TOOL FOR FOLLOWING EA IMPLEMENTATION IN THE ARCTIC LMES	13
5. REPORT ON DEVELOPMENT IN DEFINING OR SETTING ECOLOGICAL OBJECTIVES.....	14
6. SYNTHESIS REPORT ON ECOSYSTEM STATUS, HUMAN IMPACT AND MANAGEMENT MEASURES IN THE CENTRAL ARCTIC OCEAN (CAO)	14
7. CONCEPT PAPER ON FURTHER COOPERATION UNDER THE ARCTIC COUNCIL ON ECOSYSTEM-BASED MANAGEMENT (EBM/EA) OF ARCTIC MARINE ECOSYSTEMS.....	15
ANNEX 2 – THE 7TH VALUE-VALUATION WORKSHOP BACKGROUND AND PROGRAM	16
DRAFT PROGRAM.....	17
<i>Overall goal:.....</i>	<i>17</i>
<i>Specific goals:</i>	<i>17</i>
<i>Background:.....</i>	<i>17</i>
ANNEX 3 – WORKSHOPS AND CONFERENCES 2011-2021	20

BACKGROUND

PAME established an expert group on Ecosystem Approach to Management (the EA-EG) in 2007. This was broadened in 2011 to become a PAME-led joint expert group with participation also of other Arctic Council working groups (AMAP, CAFF and SDWG). Norway and USA are co-lead countries for the theme 'Ecosystem Approach to management' (EA) under PAME.

The EA-EG has held 6 workshops, with a 7th workshop in planning. The EA-EG also held two conferences on various aspects of the Ecosystem Approach to management (EA) in the Arctic between 2011 and 2021. Progress reports on the work have been prepared regularly and the last progress report was for the 2017-2019 work plan period.

The various reports prepared by the EA-EG as referred to above are available at the PAME webpage under the Ecosystem Approach topic.

This report contains the progress of EA work during the 2019-2021 work plan (see also Annex 3).

DESCRIPTION OF 2019-2021 PROJECTS AND ACTIVITIES

1. THE 2ND INTERNATIONAL SCIENCE AND POLICY CONFERENCE ON IMPLEMENTATION OF THE ECOSYSTEM APPROACH TO MANAGEMENT IN THE ARCTIC

The title of the conference was "The Ecosystem Approach to Management of Arctic Marine Ecosystems: Integrating Information at Different Scales in the Framework of EA Implementation".

Topics addressed included Integrated Ecosystem Assessment, Ecological Quality Objectives, Marine Protected Areas, National EA Implementation by Arctic States, and the Central Arctic Ocean. While the focus was on EA implementation in the Arctic, the topic of scale integration is general and universal. The Conference was held in Bergen, Norway, 25-27 June 2019.

LEAD(S) AND PARTNERS: Norway and USA in close collaboration with the EA expert group

2. THE 7TH EA WORKSHOP ON ELEMENT NO. 5 OF THE EA FRAMEWORK, 'VALUE THE CULTURAL, SOCIAL, AND ECONOMIC GOODS AND SERVICES PRODUCED BY THE ECOSYSTEMS'

The overall goal of this workshop is to identify, understand and find ways to benefit from the diverse systems of values and valuation of nature in the shared ecosystems of an increasingly connected Arctic. The specific goals are to: identify and understand diverse values held for nature; explore the relationships between values and valuation; and to explore ways to

incorporate diverse systems of values and valuation into the Ecosystem Approach to management.

The main activity is to convene the 7th EA workshop in 2021 with focus on element No. 5 of the EA framework: Value the cultural, social, and economic goods and services produced by the ecosystem.

LEAD(S) AND PARTNERS: Norway and USA in close collaboration with the EA expert group.

3. REPORT ON DEVELOPMENT IN DEFINING OR SETTING ECOLOGICAL OBJECTIVES

The report on development in defining or setting Ecological Objectives has two main parts: concepts related to ecological objectives, and experiences gained from practical application of ecological objectives.

LEAD(S) AND PARTNERS: USA and Norway in close collaboration with the EA expert group.

4. THE JOINT ICES/PICES/PAME WORKING GROUP FOR INTEGRATED ECOSYSTEM ASSESSMENT OF THE CENTRAL ARCTIC OCEAN (WGICA)

The overall objective is to provide scientific advice on issues such as the prospect for future fisheries in the central Arctic Ocean and sensitivity and vulnerability to shipping activities. The specific activities are to: contribute to the implementation of the EA in the Central Arctic Ocean; continue development of Integrated Ecosystem Assessment (IEA); continue to report on developments within ICES/PICES/PAME Working Group on Integrated Ecosystem Assessment (WGICA) as well as other ICES activities on IEA, the meetings of scientific experts on fish stocks in the Central Arctic Ocean, and any other relevant activities.

LEAD(S) AND PARTNERS: Norway and USA in close collaboration with the AC expert group.

5. STRENGTHEN THE COMMUNICATION BETWEEN THE EA EXPERT GROUP CO-CHAIRS AND RELEVANT WORKING GROUPS IN THE AC

The overall objective is the strengthen communication between the EA-EG co-chairs and the relevant Arctic Council Working Group members to: better coordinate our work plans and efforts towards Integrated Ecosystem Assessments. Specific activities are to inform relevant Workshop Groups about progress/status of respective work; and to seek inputs.

PROGRESS ON 2019-2021 PROJECTS/ACTIVITIES

1. THE 2ND INTERNATIONAL SCIENCE AND POLICY CONFERENCE ON IMPLEMENTATION OF THE ECOSYSTEM APPROACH TO MANAGEMENT IN THE ARCTIC

The Ecosystem Approach to Management of Arctic Marine Ecosystems: Integrating information at different scales in the framework of EA implementation.

Bergen, Norway, 5-7 June 2019

Report: <https://www.pame.is/document-library/ecosystem-approach-to-management-documents/ea-conferences>

This conference was prepared with input from a planning group with members from AC countries and the EA-EG, AC working groups (AMAP, CAFF, PAME, SDWG), and ICES, PICES, and WWF. The program was developed as a combination of solicited and openly invited presentations.

The conference was attended by 54 participants from 9 countries (Canada, Kingdom of Denmark, Germany, Iceland, Japan, Netherlands, Norway, Russian, and USA), including several international organizations (AMAP, PAME, ICES, WWF). We were fortunate to have strong representation of participants from indigenous communities and organizations in Alaska, Canada, Greenland, and Norway (Sápmi) (14 in total). The list of participants is included as Annex 2.

Conference sessions

The program was structured with five sessions, bracketed by an introductory session on the first day and a concluding session by the end of the meeting on the third day:

- Session 1: Integrated Ecosystem Assessment
- Session 2: MPAs and other special areas
- Session 3: Voices from the North – a conversation about people, nature, and sustainability
- Session 4: National EA implementation
- Session 5: Central Arctic Ocean

The main topic for the conference was scale and scale integration, and we sought to illuminate this important but broad issue in each of the five sessions. The sessions were structured with a sequence (or sequences) of presentations followed by discussions recorded by appointed rapporteurs.

All sessions (except session 3) were held in plenary, moderated by a session chair. Session 3 was an exception where, after introductory presentations, there were three parallel breakout groups that reported back in plenary at the end of the session.

All in all, there were 45 presentations in the five sessions plus the opening session. All presentations are available at the [conference site](#), while summaries are included in Annex 3 of the Conference Report.

Main conclusion from the symposium:

Integrated Assessment are made within working groups of ICES and PICES (Table 1) for the Central Arctic Ocean (WGICA), the Barents Sea (WGIBAR), the Norwegian Sea (WGINOR), the East Greenland (WGIEAGS) and the Northern Bering- and Chukchi Seas (WGNBC). The assessments are made on shared physical, chemical, and biological national ecosystem data for the involved countries and knowledge on human activities and national management measures for the LME. Long term monitoring data are preferred, and beside national monitoring, usually made by national governmental Institutions, international approaches are being, or have been established (e.g. the Distributed Biological Observatory DBO).



Table 1. the Integrated Assessment Working groups of ICES and PICES

Large Marine Ecosystem (LME)	Institution	Involved responsible countries	Leads year 2021
Barents Sea WGIBAR	ICES	Russia and Norway	E. Eriksen (NO) A. Filin (RU)
Norwegian Sea WGINOR	ICES	Norway, Iceland and Faroe Islands	P. Arneberg (NO) A. Ólafsdóttir (ICE)
Central Arctic Ocean WGICA	ICES- PICES- PAME	Norway, USA, Canada, Russia, United Kingdom of Denmark, Netherlands, Japan, Finland, Korea, China, Germany, and Sweden	LL. Jørgensen (NO) M. v.d. Heuvel-Greve (NET) S. Saitoh (JAP)
N. Bering – Chukchi Sea WGIEANBS-CS	PICES- ICES	USA, Russia, Norway, China, Korea, Japan	L. Logerwell (USA) Yury Zuenko (Russia)
Eastern Greenland WGIEAGS	ICES	United Kingdom of Denmark	Colin Stedmon (DK) Jesper Boje (DK)

The Canadian high Arctic initiative the “*Beaufort Regional Strategy Environmental Assessment*” (partnership with Inuvialuit Regional Corporation and Inuvialuit Game Council) has an advisory Committee comprised of relevant stakeholders that provides advice and feedback throughout the assessment. Research priorities are identified by local communities and funding provided each year to address stated priorities.

The Canadian Beaufort Sea Marine Ecosystem Assessment (CBS-MEA) has the goal to generate science advice for co-management of the Beaufort Sea to conserve and protect its aquatic ecosystems and species from human impacts and to inform adaptation strategies for a shifting subsistence food base. The assessments include climate change/variability; subsistence food security, shipping; ocean management & marine spatial planning and new stressors.

For Canadian Baffin Bay and Davis Straits the “*Nunavut Impact Review Board*” has strategic Environmental Assessments, correspondence, comments and reports relating to the assessment. The Government of Canada and Nunavut ask to strengthen monitoring and management efforts on marine shipping traffic in Nunavut waters” as an Inuit-led monitoring system.”

Greenland has discussed the potential for a more EA-based approach to spatial planning for Baffin Bay, but lack of administrative resources hampers the development. The need for local involvement and outreach has been underlined, as well as monitoring to secure sustainable use.

2. THE 7TH EA WORKSHOP ON ELEMENT NO. 5 OF THE EA FRAMEWORK, 'VALUE THE CULTURAL, SOCIAL, AND ECONOMIC GOODS AND SERVICES PRODUCED BY THE ECOSYSTEMS'

The 7th EA Workshop Planning Committee has been meeting monthly during 2020. The workshop, originally scheduled to be held after PAME II in Nome Alaska, has been postponed until at least March 2021. In the meantime, the Committee is organizing virtual seminars to develop a background White Paper on Value and Valuation in EA.

These separate virtual seminars were organized with indigenous and traditional knowledge holders, economists, social scientists and marine scientists for focused discussion on topics specific to each area of expertise.

The virtual seminars conducted to date:

- Jake Rice (Canada): Human-Rights and value diversity
- Liisa Saikkonen (SYKE): experiences regarding marine ecosystem valuation in the Baltic Sea and European marine waters
- Dan Lew (NOAA): value and valuation from the economic perspective
- Dennis Thurston, Maureen Copely, Nicole Kanayurak and Gunn-Britt Retter: MEMA
- Kirstin Holsman (NOAA): NOAA Ecosystem science and modeling (TBD)
- Community, IK/LTK teleconferences and interviews
 - Alaska, October and January (Nicole Kanayurak)
 - Norway, North Saami, December (Gunn-Britt Retter)

During the planning period it is planned to invite expertise on different aspects of the value and valuation, including the Economic sciences, Social sciences, and Natural sciences.

For the Draft Program and Background (per December 2020) with a list of EA-relevant policy contexts see Annex 2.

3. REPORT ON DEVELOPMENT IN DEFINING OR SETTING ECOLOGICAL OBJECTIVES

The report on development in defining or setting Ecological Objectives has two main parts: concepts related to ecological objectives, and experiences gained from practical application of ecological objectives

An extended outline was prepared by Dr. Hein Rune Skjoldal for the PAME II in 2019. A first draft will be prepared and input from PAME members and the EA expert group will be allowed.

Timeline is open.

4. THE JOINT ICES/PICES/PAME WORKING GROUP FOR INTEGRATED ECOSYSTEM ASSESSMENT OF THE CENTRAL ARCTIC OCEAN (WGICA)

The joint ICES/PICES/PAME Working Group for Integrated Ecosystem Assessment of the Central Arctic Ocean (WGICA) covers the Central Arctic Ocean (CAO) from the slopes down to the deep Eurasian and Amerasian basins. The fluxes and properties of water through the Atlantic and Pacific gateways, connecting the Arctic to other oceans, are part of the physical and biological variability of the basins of the CAO.

WGICA has had Annual meetings in Japan (2019) and as a web-based meeting in April 2020. Annual Reports are published and available at <https://www.ices.dk/community/groups/Pages/WGICA.aspx>.

Executive summary for 2020.

The working group on the Integrated Assessment of the Central Arctic Ocean (WGICA) aims to provide a holistic analysis of the present and future status of the ecosystem and human activities therein. A lack of consistent spatially and temporally dataset from the Central Arctic Ocean (CAO) limit trends and warning signal analyses. But the group aims toward an Ecosystem Overview (EO) that relate the main regional pressures with the human activities and the ecosystem components that are most impacted by these pressures.

Climate change reduce sea ice, increased light penetration, cause regionally variable trends in stratification and mixing of the water column, increased inflow in both the Atlantic and Pacific sectors, and heating of waters at the surface and extending deeper and deeper. These changes in turn affect primary production and cascade through the food web to ice-associated fauna, zooplankton, fish, benthos, and sea mammals. These changes may be exacerbated by increasing human activities in and around the CAO, and Current and future human activities in the context of climate change includes contaminants from outside the CAO that are currently a main source of pollution. Macro-, micro- and nanoplastics, transported by rivers and ocean currents, have been found in sea ice and wildlife. Sea ice is an important sink for microplastics.

The number of ships and the distances traveled are increasing. Oil spills from activities on the shelves may affect the ecosystem. Ocean mining may expand into the Arctic resulting in biodiversity loss while most species in the CAO remain undiscovered. Tourism is generally associated with ships or, in smaller volumes, as flights to the North Pole.

An agreement has been made to ban commercial fishing in the high seas of the Central Arctic Ocean. The effects of a warming ocean, retreating ice-cover and acidification on fish are examined from ecological and policy perspectives. Negative impacts on the polar cod population will negatively impact ringed seals and beluga whales and therefore will also affect subsistence harvests in the future.

Until 2024, human activities, pressures and related management organizations/measures, and a climate and vulnerability assessment will be described.

Are still working with the first IEA report will be published as a Cooperative Research Report following peer review and technical editing by ICES. Dates and deadline? PAME also notes the plan to produce a second version IEA report with more emphasis on impacts of human activities on the CAO ecosystem to be completed in 2021. PAME notes the upcoming meeting of the Provisional Scientific Coordinating Group under the Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean and opportunities for collaboration.

WGICA shall produce and deliver annual reports as well as three final reports before year 2024:

Annual Reports (Interim Reports)

The annual report of 2020 can be downloaded here:

<http://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=36908>.

New reports will follow each year, answering the 3-year ToRs and give the last updates on scientific work from the CAO.

Final Reports

Three final reports are planned.

- Report 1 - Ecosystem description of the CAO
- This report (approximately 350 pages) is in production and details are given in chapter 2 of this annual report.
- Report 2 – part I: Human activities and impact; part 2: climate- and vulnerability assessment of the Central Arctic Ocean (CAO)
- This report will build on Report 1 and will start in winter 2020 with a deadline October 2024.
- Ecosystem Overview (EO) – CAO
- Ecosystem overviews provide a description of the ecosystems, identify the main human pressures, and explain how these affect key ecosystem components. Such overviews are approximately 15 pages and updated each third year. We started the EO for the CAO in June 2020 and a first draft will be delivered in November 2020.

Planned activities 2020-2024:

- Web-based meeting in subgroups scattered throughout the year, arranged by ToR/subgroups leaders
- ICES refine the **EO** background report to a management product
- **Spring digital meeting 12-13 April:** *Report 2, part 1: Human activities and ecosystem impact of the CAO*
- **Fall meeting 12-13 October:**
 - Defining ToR for next period 2022-2024
 - Finishing Annual Report 2019-2021
 - Defining outline and responsibilities for *Report 2, part 2: Integrated assessment and Risk analyses of the CAO* (to be written during 2022-2024)

5. STRENGTHEN THE COMMUNICATION BETWEEN THE EA EXPERT GROUP CO-CHAIRS AND RELEVANT WORKING GROUPS IN THE AC

The goal of this activity is to strengthen the communication between the EA-EG co-chairs and the relevant Arctic Council Working Group members to: better coordinate our work plans and efforts towards Integrated Ecosystem Assessments

Specific activities are to inform all about the progress/status of respective work; and to seek inputs, as relevant by:

- Distributing the EA-EG Progress Report annually
- Inviting Working Group members to join workshop and conference planning committees
- Inviting Working Group members to contribute to development of the next (2021-2023) work plan.

Update 2021:

- AMAP, CAFF and SDWG were involved in a series of planning-meeting for the 7th workshop
- WGICA suggested joining forces with AC working groups (AMAP, CAFF, Shipping and more) to make an Integrated Ecosystem Assessment for the CAO
- AMAP-CAFF is developing a joint project and PAME has been active in the planning process

ANNEX 1 – EA WORK PLAN 2021-2023

Ecosystem Approach to Management (EA) (7 activities)

1. 7TH EA WORKSHOP ON VALUES AND VALUATION OF THE CULTURAL, SOCIAL AND ECONOMIC GOODS AND SERVICES PRODUCED BY THE ECOSYSTEMS

Leads: Norway and the United States in close collaboration with the EA expert group

Rationale and overall objective: To identify, understand and find ways to benefit from the diverse systems of values and valuation of nature in the shared ecosystems of an increasingly connected Arctic.

- Identify and understand diverse values held for nature;
- Explore the relationships between values and valuation; and,
- Explore ways to incorporate diverse systems of values and valuation into the Ecosystem Approach to management.

Main activities: Convene the 7th EA workshop in 2022 with focus on element No. 5 of the EA framework: Value the cultural, social, and economic goods and services produced by the ecosystem.

Timeline: 2022 (continuation from previous work plan)

Funding: In-kind

2. THIRD INTERNATIONAL SCIENCE AND POLICY CONFERENCE ON IMPLEMENTATION OF THE ECOSYSTEM APPROACH TO MANAGEMENT IN THE ARCTIC

Leads: Norway and the United States in close collaboration with the EA expert group

Rationale and overall objective: Topics that include common understandings on implementation; cooperation and joint work; challenges and solutions; and other aspects as developed by a conference planning group.

Main activities: A planning group will be established in 2021 with representatives of co-conveners and others. During 2022 this group will develop the program, identify and invite speakers, arrange for editing and publication of the proceedings, solicit sponsors, and provide for other operational details of the conference. Presentations, panels, and discussion groups at the conference (tentative 2023 or 2024) will review information, experiences, and examples of EA implementation in Arctic waters, as well as other aspects as developed by a conference planning group. A Conference Report will also be prepared during 2023-2024.

Timeline: 2021-2023 (continuation from previous work plan)

Funding: In-kind

3. INTEGRATED ECOSYSTEM ASSESSMENT (IEA) OF THE CENTRAL ARCTIC OCEAN (WGICA)

Leads: Norway, United States; **Partners:** ICES, PICES

Rationale and overall objective: Continue the development of Integrated Ecosystem Assessment (IEA). Continue to report on developments within ICES/PICES/PAME WG on Integrated Ecosystem Assessment (WGICA) as well as other ICES activities on IEA.

Main activities:

1. WGICA to draft Report on human activities (Part 1) and climate and vulnerability assessment (Part 2) of the Central Arctic Ocean (CAO); and,
2. Coordinate and collaborate with the Shipping Expert Group and other AC WGs, as relevant.

Timeline: 2021-2023 (ongoing cross-cutting initiative by ICES/PICES and PAME)

Funding: In-kind

4. REVISE THE ECOSYSTEM APPROACH FRAMEWORK (EA) AND DEVELOP A TOOL FOR FOLLOWING EA IMPLEMENTATION IN THE ARCTIC LMES

Leads: Norway and the United States in close collaboration with the EA expert group

Rationale and overall objective: Elaborate from the six-point EBM framework described in the 2019 Guidelines for Implementing an Ecosystems Approach, and assess relevant EA information within the Arctic Council with the aim to strengthen the integration of an ecosystem approach into assessments and management recommendations.

Main activities:

1. Reviewing and synthesize existing EA literature from reports of the EA EG and relevant EA literature globally (literature review);
2. Describing new element of the EA framework (“Monitoring” and “Advisory products”)
3. Producing a new EA circular figure with a in depth explanation;
4. Map and summarize information from Arctic Council WGs of relevance to EA;
5. Produce a communications strategy (e.g., conferences, workshops, Toolbox to guide future EA implementation); and,
6. Develop a tool for ongoing reporting mechanism on EA implementation in the Arctic Large Marine Ecosystems (LMEs).

Timeline: 2021-2023

Funding: In-kind

5. REPORT ON DEVELOPMENT IN DEFINING OR SETTING ECOLOGICAL OBJECTIVES

Leads: Norway and the United States in close collaboration with the EA expert group

Rationale and overall objective: The objective is to continue to integrate the ecosystem approach into assessments and management recommendations through follow-up to the 2013 EBM marine-related recommendations, taking into account previous work on Large Marine Ecosystems (LMEs), and new and ongoing EA activities of cross-cutting nature.

Main activities: This project will report on developments in defining or setting ecological quality objectives in the context of EA implementation in national and international processes.

Timeline: 2021-2023 (continuation from previous work plan)

Funding: In-kind

6. SYNTHESIS REPORT ON ECOSYSTEM STATUS, HUMAN IMPACT AND MANAGEMENT MEASURES IN THE CENTRAL ARCTIC OCEAN (CAO)

Co-leads: Canada, Finland, Sweden, United States, WWF

Rationale and overall objective: The aim of this project is to synthesize relevant information on the status, trends and projected changes in the CAO Large Marine Ecosystem (LME), human activities and pressures in the area, and the current management measures in place in order to inform future policy and decision making.

Main activities: A synthesis report will be prepared drawing on published information and reports by the PAME/ICES/PICES Working Group on the Central Arctic Ocean (WGICA), other Arctic Council working groups and other information sources, such as the Central Arctic Ocean (CAO) Fisheries Agreement Provisional Scientific Coordinating Group. This project will also specifically contribute to the WGICA report *Human Activities, Pressures, and the Impact on the Ecosystems of the Central Arctic Ocean – Measures and Knowledge Gaps* to be completed within the same timeline.

Timeline: 2021-2023

Funding: In-kind

7. CONCEPT PAPER ON FURTHER COOPERATION UNDER THE ARCTIC COUNCIL ON ECOSYSTEM-BASED MANAGEMENT (EBM/EA) OF ARCTIC MARINE ECOSYSTEMS

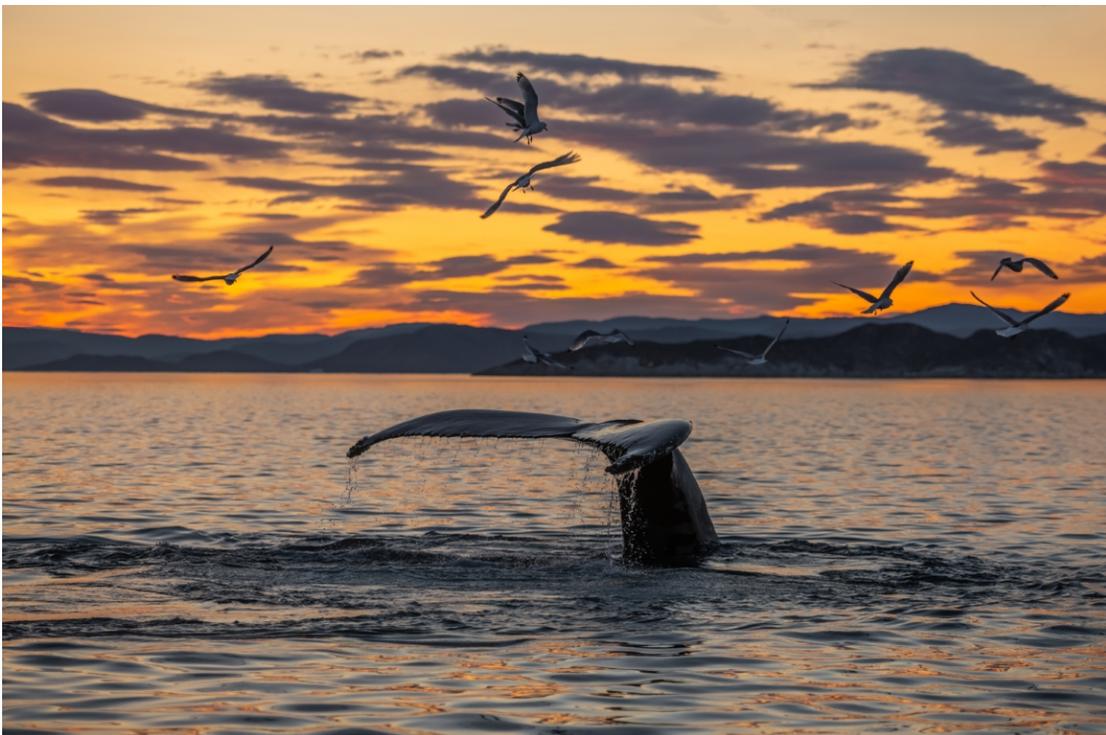
Leads: Norway in close collaboration with the EA expert group

Rationale and overall objective: The need for ecosystem-based management (EBM/EA) to ensure sustainable use and protection of the marine environment is widely recognized by the international community, the Arctic Council, and the Arctic States and Permanent Participants of the Council. EBM, therefore, is a suitable framework for efforts to enhance cooperation on Arctic marine stewardship under the Arctic Council. This concept paper explores the case for enhanced transboundary cooperation and coordination of Ecosystem Based Management of the Arctic marine environment. A set of actions will be proposed to develop such cooperation further in the coming four years.

Main activities: Review the concept paper and provide input and further guidance to SAOs, including expert advice and recommendations to be discussed at the earliest possible SAO meeting of the incoming Russian Chairmanship.

Timeline: 2021-2023

Funding: In-kind



ANNEX 2 – THE 7TH VALUE-VALUATION WORKSHOP BACKGROUND AND PROGRAM

Broad policy area: Ecosystem approach to management in marine and coastal zones.

Preliminary list of EA-relevant policy contexts where the understanding and capability to consider and capture values affect decision-making.

- Over-arching contexts
 - ✓ Institutionalization of EA/EBM processes per se;
 - ✓ Mainstreaming of biodiversity objectives, inputs into broad scale reporting UN, CBD, Arctic Biodiversity Assessment, GEOBON, etc.
 - ✓ Public participation in decision-making, devolution; this should involve more than stakeholders but also Indigenous community members.
 - ✓ Application of value and valuation in multilateral and international frameworks (e.g. UN CBD, UNEP, GEF, Agenda 2030). Also need to look bottom up so communities values are included.
- Marine and coastal spatial planning
 - ✓ Harvesting /fishing quotas and rights at local through national and international scales; Indigenous communities have concerns about uncontrolled fishing. US Arctic is unique because un-fished commercially at this time; and coastal community values are unique to the Arctic
 - ✓ Planning and management of industrial development (shipping, marine and coastal infrastructure, non-renewable resources, critical minerals, renewable energy) – e.g. through strategic environmental assessments and environmental impact assessments; Including ecological compensation?/ Benefit sharing? What are we doing regionally in the Arctic for guidelines about shipping, tourism, etc. Must also consider protection of the safety and values of the people in the Arctic (not just protection of the environment).
 - ✓ Identification and management of specially managed areas (promotion of cultures and conservation of biodiversity).
- Human rights and equitability
 - ✓ Indigenous rights issues, other issues of rights to resources, and managing common goods;
 - ✓ Food security, sovereignty and livelihoods, equitability; and
 - ✓ Access to and activities in areas;
- Management and monitoring approaches

- ✓ Management (and co-management) of living renewable resources; How can management and co-management be improved by taking an Ecosystem Approach? For example, multi-species management across sectors.
- ✓ Monitoring (including community-based monitoring); Monitoring approaches (i.e. taking a EA approach vs only monitoring economically important species as is often done).
- Human impacts
 - ✓ Environmental risk management and response.
 - ✓ Pollution and waste management, including prevention of marine litter.
 - ✓ Invasive species (For example potential impact of Elodia on Salmon rivers, cost of inactivity).
- Economic and fiscal policies linked to coastal and marine livelihoods (e.g. subsidies, cost of no-action, economic valuation of ecosystem services).
- (Human) adaptation and resilience to climate change, especially ecosystem-based adaptation, ecosystem disservices (functions or properties of ecosystems that cause effects that are perceived as harmful, unpleasant or unwanted).
- Values depend on stakeholders and vary significantly within an area and at a broader scale; Stakeholder analysis?

DRAFT PROGRAM

Overall goal:

To identify, understand and find ways to benefit from the diverse systems of values and valuation of nature in the shared ecosystems of an increasingly connected Arctic.

Specific goals:

- Identify and understand diverse values held for nature
- Explore the relationships between values and valuation
- Explore ways to incorporate diverse systems of values and valuation into the Ecosystem Approach to management

Background:

The concept of the Ecosystem Approach to management (EA) has been around for at least 30 years and has been extensively discussed, elaborated and developed within national and international fora. The Convention on Biological Diversity adopted a Guidance for the Ecosystem Approach in 2000 at its 5th Conference of the Parties (CBD COP V/6)¹. The EA was adopted as an overarching principle and approach by Arctic Council (AC) Ministers in 2004 as part of the Arctic Marine Strategic Plan (AMSP). In 2011, the Ministers established an expert group on Arctic ecosystem-based management (EBM), which reviewed the EA (or EBM)

¹ <https://www.cbd.int/decision/cop/default.shtml?id=7148>

concept² and provided a definition of EA along with principles and recommendations that were adopted as part of the Kiruna Declaration in 2013 (see Box 1). In Iqaluit in 2015, and in Fairbanks in 2017, the Arctic Council Ministers recognized the need for EA and requested and encouraged the development of practical guidelines for EA implementation in the Arctic. The AC Working Group, Protection of the Marine Environment (PAME) established an EA Expert Group (EA-EG) in 2007 that was broadened in 2011 as a joint group with participation of three other Arctic Council working groups (AMAP, CAFF, and SDWG).

The Joint Ecosystem Approach (EA) Expert Group (EA-EG) has held 6 workshops in 2011-2018 on various aspects of development of EA to the management of Arctic marine ecosystems and two international conferences on EA implementation in the Arctic (Fairbanks, Alaska, August 2016, and Bergen, Norway, June 2019). To guide the development and implementation of the EA to Arctic marine ecosystems, the joint EA-EG prepared an EA framework that was used as a basis for the report **‘Status of Implementation of the Ecosystem Approach to Management in the Arctic’** in 2017³, and **‘Guidelines for Implementing an Ecosystem Approach to Management of Arctic Marine Ecosystems’**⁴ that were welcomed by Arctic Council ministers in Rovaniemi in May 2019. *‘Value the cultural, social and economic goods and services produced by the ecosystem’* is one of the six elements of the EA framework (Box 2).

What are “values”? In an increasingly connected world, it is more and more the case that cultures with different systems of valuing nature share the same ecosystem. As the EA considers the “comprehensive management of human activities based on best available knowledge...to take action on influences that are critical to the health of the ecosystem...[for] achieving sustainable use... and ecosystem integrity” (Box 1), it must be grounded in an understanding of the diversity of values held for the ecosystem, which informs the meaning of terms such as the ecosystem itself, its health and integrity, sustainable use, best available knowledge and actions considered for management. A prominent issue in the Arctic that needs to be recognized up front is that value systems differ between Indigenous Peoples and more industrialized societies. This difference fundamentally affects the understanding of the relationship between ecosystems and people and hence the objectives of management and the types of knowledge that concern the EA. For example, if the ecosystem is considered a ‘home’ or a ‘garden’, and if a community is grounded in an awareness of its direct nutritional, cultural, and spiritual dependency on the ecosystem, it is likely to value nature in a different way compared to communities who regard nature as a resource for creating profit or for economic development.

What is “valuation”? Broadly, valuation is how a culture qualifies and quantifies the values it attaches to things. This means identifying the relative importance of relationships between the individual (or the individual’s community) and the many different parts of “nature”, “social relations” and “economy” that surround the individual. The valuation task is complex and diverse even within a single culture, as various components of nature are valued by different communities in different ways and for different reasons. Considering values held for nature

Box 1. What is the “Ecosystem Approach”?

Comprehensive, integrated management of human activities based on best available scientific and traditional knowledge about the ecosystem and its dynamics, in order to identify and take action on influences that are critical to the health of ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity.

(Kiruna Declaration. The Eight Ministerial Meeting of the Arctic Council. May 15, 2013. Kiruna, Sweden. <http://hdl.handle.net/11374/93>)

² EA and EBM are synonymous terms for the same management concept.

³ <http://hdl.handle.net/11374/1927>

⁴ <http://hdl.handle.net/11374/2390>

across cultures with different sets of values, different valuation systems and different institutionalisation of related decision- making processes is an even more complex endeavour.

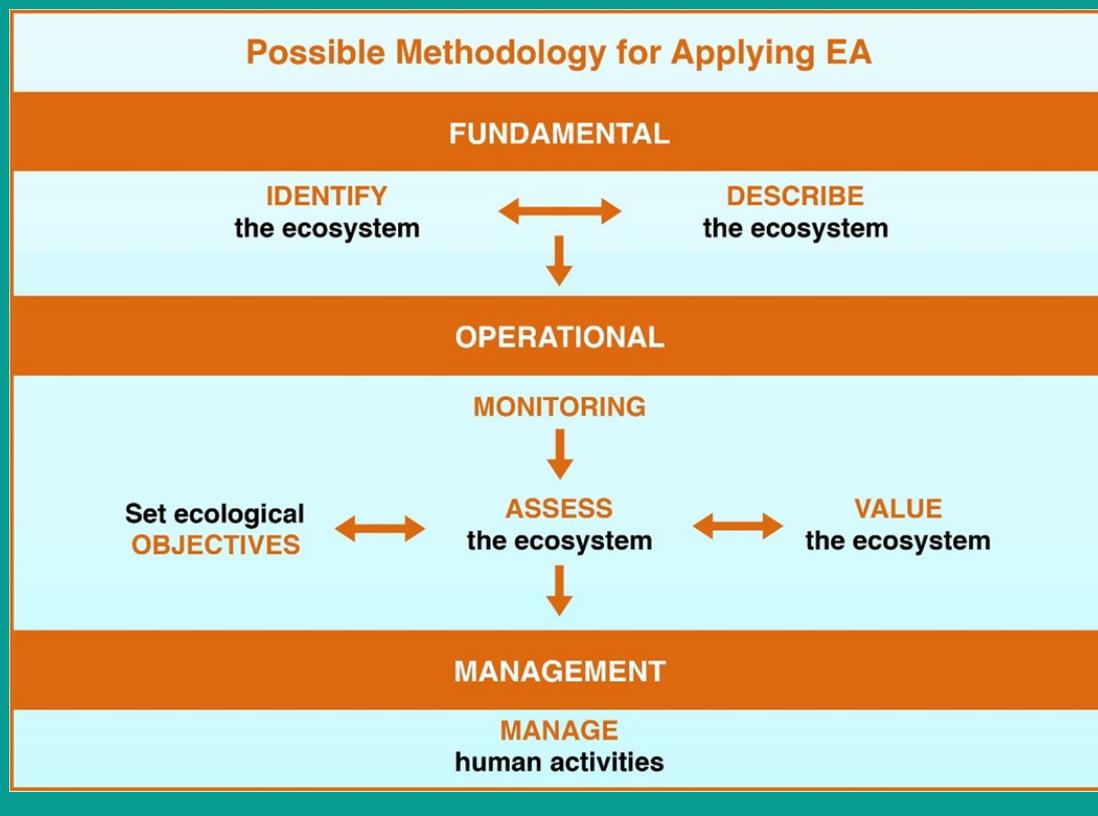
This workshop will hold conversations about different systems of valuing nature, the relationship between values and valuation, and ways to incorporate values and valuation into the Ecosystem Approach.

Box 2. What is the EA Framework?

The Arctic Council has developed a framework for implementation of the Ecosystem Approach to management of human activities in Arctic marine and coastal environments. The EA framework consists of six related elements:

- 1) *Identify the geographic extent of the ecosystem;*
- 2) *Describe the biological and physical components and processes of the ecosystem including humans;*
- 3) *Set ecological objectives that define sustainability of the ecosystem;*
- 4) *Assess the current state of the ecosystem (Integrated Ecosystem Assessment):*
- 5) *Value the cultural, social and economic goods produced by the ecosystem; and*
- 6) *Manage human activities to sustain the ecosystem.*

While they are numbered, the elements do not necessarily need to be sequential although they are eventually linked in an iterative and adaptive operational management cycle. Monitoring is an essential component of EA as illustrated in the schematic representation of the framework.



ANNEX 3 – WORKSHOPS AND CONFERENCES 2011-2021

Workshops 2011 - ongoing:

<https://www.pame.is/document-library/ecosystem-approach-to-management-documents/ea-workshop-reports>

2011

1st workshop on the Ecosystem Approach to Management: Update of the working map of Arctic LMEs and Status reporting for Arctic LMEs

- Facilitate exchange of information on the development of ecosystem status reports.
- Identify possible arrangements and integration of monitoring and assessment.
- Identify possible elements to the development of the Arctic Marine Strategic Plan (AMSP 2004) Phase I 2011-2013 scoping process.

2012

2st workshop on the Ecosystem Approach to Management

- Monitoring and Assessments within the Arctic Council
- Monitoring and assessments - National/international/case presentations
- Input to updating of the Arctic Marine Strategic Plan (AMSP)
- LME map and inventory of ecosystem status reports

2013

3rd workshop on the Ecosystem Approach to Management

- Overview of ecosystem approach and data needed for integrated assessment
- Case studies: Geographic paradigms in ecosystem-level data acquisition, integration and dissemination for conducting assessments and advancing EA
- Arctic Council Working Groups

2014

4th workshop on the Ecosystem Approach to Management - Understanding national approaches and reviewing progress on the IEA in the Arctic LMEs straddling national boundaries: The Beaufort and Barents Sea.

- Introduction – History, approaches, current projects on EA and IEA within the Arctic Council
- National overviews from the Beaufort, Approaches to IEA in the Beaufort Sea
- National overviews from the Barents, Approaches to IEA in the Barents
- Discussions of Lessons Learned

- Discussions and Specifications of Products and Next Steps

2015

5th workshop on the Ecosystem Approach to Management – Methodology and status of development of ecological (quality) objectives for Arctic Large Marine Ecosystems

- Review of existing ecological objectives in national legislation and management systems
- Review of new developments of comprehensive sets of ecological objectives
- Perspectives from indigenous peoples: values and objectives for use and management of living resources and nature

2018

6th workshop on the Ecosystem Approach to Management – the development of guidelines for Ecosystem Approach to management (EAM) in the Arctic (WKEAMA)

- Development of EA guidelines
- Integrated Ecosystem Assessment

2020-2021

7th workshop on the Ecosystem Approach to Management – the value and valuation

Under planning

Conferences 2016 - 2019

<https://www.pame.is/document-library/ecosystem-approach-to-management-documents/ea-conferences>

2016, Alaska, Fairbanks

International science and policy conference. The ecosystem approach to management: status of implementation in the Arctic

- The Vision and Role of the Arctic Council
- Status and Experiences from National Implementation
- Making EA operational – developing the knowledge base and enabling activities
- Case studies – steps toward implementation
- Pan-Arctic marine science and policy.
- Status of Implementing the Ecosystem Approach to Management in the Arctic
- The Kiruna EBM recommendations

2019, Norway, Bergen

International Science and Policy Conference. Implementation of the Ecosystem Approach to Management in the Arctic. *The Ecosystem Approach to Management of Arctic Marine Ecosystems: Integrating information at different scales in the framework of EA implementation*

- Integrated Ecosystem Assessment
- MPAs and other special areas
- Voices from the North – a conversation about people, nature, and sustainability
- National EA implementation
- Central Arctic Ocean

2022-2025 (planning, implementation, and report)

Third International Science and Policy Conference on Implementation of the Ecosystem Approach to Management in the Arctic

Title: “How far has the international Arctic community, including Arctic States, come in implementing EA? Cooperation, challenges, understanding, and a way forward”.

PAME SECRETARIAT

Borgir, v. Nordurslod

Akureyri - Iceland

Tel: +354 461 1355

pame@pame.is

pame.is