

# PAME WORK PLAN 2025-2027

MAY 2025



ARCTIC COUNCIL

# PAME

Protection of the Arctic Marine Environment

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MAY 2025

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# Preface

PAME focuses on the marine agenda of the Arctic Council and provides a unique forum for collaboration on a wide range of activities directed towards the protection and sustainable use of the Arctic marine environment.

*PAME's activities are based on its mandate: to address marine policy measures and other measures related to the conservation and sustainable use of the Arctic marine and coastal environment in response to environmental change from both land and sea-based activities, including non-emergency pollution prevention control measures such as coordinated strategic plans as well as developing programs, assessments and guidelines, all of which aim to complement or supplement efforts and existing arrangements for the protection and sustainable development of the Arctic marine environment.*

PAME provides a unique forum for collaboration on a wide range of Arctic marine environment issues and consists of representatives from the Arctic states, who are responsible for its work in their respective countries, and representatives of Permanent Participant organizations on behalf of Arctic indigenous peoples. Additionally, the other Arctic subsidiary bodies, accredited observers and other Arctic stakeholders contribute to the ongoing work of PAME.

PAME generally meets twice a year to assess progress and advance its work. PAME is headed by a Chair and Vice-Chair, which rotate among the Arctic States and are supported by a Secretariat based in Iceland. PAME reports to the Senior Arctic Officials (SAOs), and through them, to the Ministers of the Arctic Council who meet every two years. PAME's work plan is approved by the SAOs and the Ministers.

# Introduction

The PAME 2025-2027 Work Plan was developed in accordance with PAME's mandate; priorities identified and recommendations made within Arctic Council approved reports; direction provided from Ministerial declarations; follow-ups on recommendations from Arctic Council projects and the AMSP (2015-2025), which outlines the overall direction of the Arctic Council for the protection of the Arctic marine environment; and policy follow-up on the scientific and other relevant assessments of the Arctic Council. Additional project proposals may be developed within the scope of this Work Plan between 2025-2027, subject to PAME approval, confirmed lead/co-lead commitment and financing. Many projects have in-kind support from Arctic States and PPs. Additional support is requested through grant applications and State contributions.

# List of individual projects and activities

## ARCTIC MARINE SHIPPING (12 ACTIVITIES)

### *Arctic Ship Traffic Data (ASTD) Program*

**Co-leads:** Norway, USA, PAME Secretariat

**Rationale and overall objective:** Continue to strengthen the ASTD Program by augmenting its functionality and facilitating access to eligible stakeholders.

**Main activities:**

1. Augment the ASTD System with new functionalities, adding new data layers and additional data, enhancing its analytical and report generating capabilities.
2. Facilitate access for eligible users, including Arctic States, PPs, Observers, Arctic Council subsidiary bodies, students, Bona Fide Media Organizations and Not-for-Profit Professional, Academic, Research, and Environmental Organizations.

**Timeline:** Ongoing/continuation from previous work plan.

**Funding:** As per the *ASTD Framework Agreement – Arctic Council Framework for Cooperative Action on Arctic Ship Traffic Data Sharing* in addition to Level III access fees and in-kind contributions.

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### *Arctic Shipping Status Reports (ASSR)*

**Co-leads:** USA, PAME Secretariat

**Rationale and overall objective:** To provide a snapshot of Arctic shipping activities by utilizing PAME's ASTD Program to generate topical, fact-based, user-friendly reports.

**Main activities:** Develop user-friendly, illustrative information reports on Arctic shipping activities that describe notable trends, highlight important developments, and depict interesting and important information. The goal is to produce 3-4 reports each year and once approved by PAME, disseminate them to the general public and other stakeholders.

**Timeline:** Ongoing (continuation from previous work plan)

**Funding:** \$23,000 USD and in-kind.

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## **Arctic Shipping Best Practice Information Forum**

**Co-leads:** Kingdom of Denmark, Canada, USA

**Rationale and overall objective:** To support the effective implementation of IMO's Polar Code and, more broadly, sustainable Arctic shipping.

**Main activities:** The project will convene at least one Forum meeting (virtual or in-person as appropriate) of Participants and continue the development and expansion of the Forum's web portal ([arcticshippingforum.is](http://arcticshippingforum.is)). The web portal includes hundreds of links to information related to the effective implementation of a compliance with IMO's Polar Code. It also serves as a resource hub of information, guidance, and guidelines that aid decision makers involved in Arctic marine navigation and those affected by maritime operations related to the Polar Code. The project will also explore the possibility of modest refinements to the Forum's 2017 Terms of Reference (ToR).

**Timeline:** Ongoing/continuation from previous work plan.

**Funding:** In-kind and voluntary contributions from Forum participants.

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## **Raising awareness in the Arctic Council of the provisions of the 2012 Cape Town Agreement**

**Co-leads:** Iceland, Spain, IMO

**Rationale and overall objective:** The main objective of this project is to raise awareness of the provisions of the *2012 Cape Town Agreement* and the experience gained in the implementation process by Arctic States and other nations, recognizing the importance of fishing vessel safety in the Arctic due to the increased traffic of fishing vessels in the region. Noting that the State criteria requirement for entry into force of the Cape Town Agreement (22 State ratifications) has been met but the requirement for an aggregate number of fishing vessels of 24 meters in length and over operating on the high seas (3600) has not, PAME encourages Arctic States and Observer States which have not done so to consider ratifying the Agreement.

**Main activities:** Continue the project Correspondence Group and:

- Develop an Arctic Shipping Status Report (ASSR) on fishing vessel activities in the Arctic with its project co-leads.
- Develop a Summary Report that includes the findings from the ASSR Report, and highlights the provisions of the Cape Town Agreement for the Safety of Fishing Vessels, that includes:
  - Information on challenges Arctic States or Observer States may have had in ratifying the Agreement;

- Information on national legislation that may be considered to cover wholly or partially the Agreement; and
- An overview of such challenges and national legislative information with suggestions for a way forward.
- Convene an online webinar for PAME Members and interested Arctic Council Working Groups where States share their experience, and challenges that may have been identified.

**Timeline:** 2025-2027 (continuation from previous work plan).

**Funding:** In-kind

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## ***Wastewater Discharges from Ships in the Arctic (Phase II) - Quantification and Best Practices***

[Annex 1](#)

**Co-leads:** Iceland, ICC, WWF, and CCU.

**Rationale and overall objective:** Building on the work conducted during Phase I (Wastewater Practices in The Arctic: Qualitative Insights report, 2022), Phase II consists of a quantitative analysis of vessel wastewater production in the Arctic and the creation of wastewater best practices for ships operating in the region.

**Main activities:** This work will provide Indigenous Peoples and Arctic stakeholders including industry, and national governments, amongst others, with estimates of the volume of wastewater produced and discharged into Arctic waters on an annual basis based on real-life ship traffic and attribute data. In turn, this will facilitate dialogue about enhancing the sustainability of marine shipping in high latitude regions, and will augment a discussion on, and the use of, best practices.

**Timeline:** Ongoing/continuation from previous work plan.

**Funding:** \$120.000 USD (including in-kind)

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## ***Interpretation of the Polar Code***

**Lead:** Norway

**Rationale and overall objective:** In order to ensure the success of the Polar Code it is of great importance to work towards facilitating a harmonized implementation and enforcement of the Polar Code. Cooperation is the key to solving these challenges, and both the IMO and Arctic Council have important roles to play. The exchanges of information of the interpretation of the Arctic and Observer States can contribute to an efficient implementation of the Polar Code. Furthermore, the exercise may contribute to

establish a "common ground" for interpretation. This will also be a valuable background for discussions at IMO and a possible future revision of the code.

**Main activities:** Continue the work in the expert group on a harmonized implementation and enforcement of the Polar Code.

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** In-kind

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## ***Collaboration with the Arctic Regional Hydrographic Commission (ARHC)***

**Lead:** USA

**Rationale and overall objective:** To foster greater communication between PAME and ARHC in line with the SAO approved (Nov 2019) non-binding MOU between these two bodies to support Arctic maritime safety, efficiency, and the protection of the Arctic marine environment. Both bodies approve a renewed and updated MOU in 2024 and signed it in January 2025.

**Main activities:** the ARHC and PAME decide to cooperate as follows:

1. Each body intends to exchange information with and consult the other on matters of common interest with a view to ensuring maximum coordination of their work and activities.
2. Each body intends to invite a representative of the other to attend any meeting at which topics within the other's area of expertise are on the agenda.
3. Each body intends to provide notice of proposed seminars, workshops, etc., that may be of interest to the other to enable joint participation should it be of mutual benefit. The bodies also intend to identify opportunities to organize seminars or workshops under joint sponsorship.
4. At the request of PAME, the ARHC intends to provide input to PAME with respect to matters within the scope of activities and expertise of the ARHC; and at the request of the ARHC, PAME intends to provide input to the ARHC for matters falling within the scope of activities and expertise of PAME.
5. PAME intends to contribute ship traffic data from its Arctic Ship Traffic (ASTD) Program to the ARHC for a project to generate an Arctic Risk Assessment calculus using variables of depth, sounding vintage, and bottom type.
6. ARHC intends to provide PAME with the results of its Arctic Risk Assessment project in an agreed format for incorporating into the ASTD Program.
7. The two bodies decide to cooperate in updating the ARHC 2017 Cautionary Notice titled "Caution Required when Navigating in Arctic Waters".

**Timeline:** Ongoing/continuation from previous work plan.

**Funding:** In-kind

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## ***Development of a Regional Reception Facilities Plan***

### [Annex 2](#)

**Lead:** Russian Federation

**Rationale and overall objective:** The Regional Reception Facilities Plan (RRFP) will include ports and terminals of Arctic States which will participate in the proposed RRFP, and ports identified in the RRFP as Regional Ships Waste Reception Centre (RSWRC) as well as all other necessary information to be required by 2012 IMO Guidelines for the Development of a Regional Reception Facilities Plan. Regional Reception Facilities Plan should be submitted to Marine Environment Protection Committee (MEPC) of the IMO.

**Main activities:**

- RRFP should be developed upon the entry into force of the amendments to MARPOL Annexes I, II, IV, V and VI on regional arrangements for port reception facilities. Relevant amendments regarding regional reception facilities within Arctic waters entered into force on 1 May 2024.
- A correspondence group (CG) should be established for implementation of this project. All Arctic States are invited to submit all necessary information.
- GISIS IMO and Arctic Port Reception Facilities Inventory will also review for obtaining background information for implementation this project.
- The Arctic States should consider and identify the Regional Ships Waste Reception Centres (RSWRC)
- The CG will hold virtual meetings for consideration of the ongoing status project as well as outstanding issues.
- Permanent Participants are invited in the implementation of the project, especially in exchanging, if appropriate, the knowledge regarding the treating, reusing, recycling, destroying or otherwise managing ship generated wastes and cargo residues collected by waste transporters.

**Timeline:** 2025-2027

**Funding:** In-kind

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## ***POLARIS: Data collection and evaluation***

### [Annex 3](#)

**Co-leads:** Canada, IMO

**Rationale and overall objective:** This project will collect information from ships using the Polar Operational Limitation Assessment Risk Indexing System (POLARIS), a key methodology for assessing ice operational risk and an integral tool of the IMO Polar Code.

**Main activities:**

1. To establish a correspondence group with relevant experts, including experts from industry and research institutions, to identify what information is necessary to conduct a review of POLARIS.
2. To collect this information from operators with the assistance of Arctic States and Observer State administrations.
3. To evaluate the information collected to understand the effectiveness of POLARIS as an operational tool.
4. To identify any needs for refinement.
5. To complete a Summary Report.

**Timeline:** Ongoing/continuation from previous work plan.

**Funding:** In-kind

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## ***Designated Potential Places of Refuge for Vessels in Need of Assistance in the Arctic: An Inventory***

### [Annex 4](#)

**Lead:** USA, IMO

**Rationale and overall objective:** Create a single pan-Arctic inventory of all officially designated potential places of refuge in the Arctic for ships in need of assistance (the project does not address persons in distress at sea). This project will improve awareness of and the processes for requesting access to potential places of refuge in the Arctic for ships in need of assistance, as recommended in AMSA Recommendation IIIA. It supports PAME's objective of protecting the Arctic marine environment by lessening the risk of pollution in the event of a disabled vessel, as well as protecting Arctic mariners and Indigenous Peoples and local communities. This project aligns well with the efforts of both the Arctic Council and the IMO.

**Main activities:**

1. Develop and circulate a questionnaire to Arctic State maritime administrations requesting information on all officially designated potential places of refuge in the Arctic for ships in need of assistance located in waters subject to their national jurisdiction.
2. Prepare a draft table or spreadsheet of the information received. Circulate the draft to Arctic States, Permanent Participants, Observers, and other Arctic Council Working Groups for review and comment.
3. Make the final inventory available on PAME's website as an aid to mariners, regulators, marine insurers, and other Arctic maritime stakeholders, including via the Arctic Shipping Best Practice Information Forum and its web portal, and as a new mapped data layer in the Arctic Ship Traffic Data (ASTD) System.
4. If appropriate, submit the inventory as an information paper to a relevant meeting of an IMO Committee or Sub-Committee.

**Timeline:** 2025-2027

**Funding:** In-kind

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## ***Arctic Marine Tourism: Mapping Whale Watching in the Arctic***

### [Annex 5](#)

**Co-leads:** Canada, United Kingdom

**Rationale and overall objective:** Compile the first information on whale watching tourism in the Arctic using PAME's ASTD in conjunction with industry engagement and a review of online information, in order to better understand recent development of this sector and to identify gaps in the data. Longer-term, this work could help inform the development of responsible marine wildlife watching measures.

While vessel-based tourism has the potential to affect whales, responsible tourism can also make a substantial contribution to local Arctic economies and whale conservation, through data collection, citizen science, and raising awareness. It is therefore important that this industry develop in a sustainable and well-managed manner, guided by research and the best available data.

**Main activities:** This project will compile information on whale watching tourism for the Arctic using PAME's ASTD Program, in conjunction with industry engagement and a review of online information, to better understand this sector and identify gaps in data through:

1. Updating analyses previously carried out on Arctic marine tourism including the British Antarctic Survey (BAS) and PAME's report on [Arctic Marine Tourism](#)

and conducting analysis of trends in Arctic marine tourism based on information from the ASTD Program, and potentially other complementary datasets, with respect to the number of cruise ships, their size, and whether they offer whale watching excursions as part of their itinerary;

2. Identifying Arctic ports and harbors where whale watching operations take place and compiling an inventory of operators and their fleets; and,
3. Identifying data/information gaps and potential ways to address these, for example, which vessels are broadcasting AIS A, B, or not at all, and how often these vessels encounter whales.

**Timeline:** 2025-2027

**Funding:** \$106,700 CAD

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### ***Best Practice Fuel Blending for Arctic Conditions***

**Lead:** Norway, Joint PAME/EPPR project

**Rationale and overall objective:** This project is based on two key findings from the PAME/EPPR-project “New Low Sulphur Fuels - Fate and Behaviour in Cold Water Conditions” (2019-2025). The aim of this project is to improve oil spill response preparedness in Arctic waters. The project will aim at increasing the understanding of low-sulphur fuels, particularly regarding the significant variations in their properties. The findings will provide important knowledge and input for discussions within the IMO regarding the potential introduction of an Arctic fuel standard, which takes a holistic approach on oil spill preparedness and climate considerations.

The project will address two interrelated research questions:

1. Investigating the impact of adding various types and amounts of biodiesel to low-sulphur fuels of different qualities and types.
2. Examining the effects of adding “cutter stock” and “additives” in varying amounts to different types of low-sulphur fuels.

**Main activities:**

This project aims to fund a preliminary project, to clearly define the main activities, establish collaboration between the different Arctic States, and define which Arctic States will be responsible for specific work packages (through in-kind contributions). Selected industry experts will be invited to participate in a reference group to provide input and expertise.

Preliminary Study Objectives and Activities (2025) will focus on the following key activities:

1. Developing the project proposal, including a detailed scope of work and definition of the various work packages. It will also identify the Arctic States responsible for each work package and establish a funding plan, including in-kind contributions.
2. Hosting a workshop where industry representatives will be invited to discuss the project plan and clarify participation in the main project.
3. Defining fuel types, fuel quality parameters, the number of fuel samples, and required sample volumes to be collected from different producers. A plan will also be developed for fuel sample collection with industry support.

The main project is scheduled for 2026 and 2027.

**Timeline:** 2025-2027, continuation from previous work plan.

**Funding:** TBD

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## MARINE PROTECTED AREAS (9 ACTIVITIES)

### *Framework for a Pan-Arctic Marine Conservation Network (2025)*

**Lead:** MPA Expert Group

**Rationale and overall objective:** Follow-up activities based on the Framework for a Pan-Arctic Marine Conservation Network (2025).

**Main activities:** The PAME Marine Protected Areas (MPA) Expert Group will explore potential follow-up activities such as by identifying key characteristics and potential gaps in the pan-Arctic conservation network's coverage and effectiveness (e.g. representativeness, connectivity, OECMs, etc.).

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** In-kind

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### *Development of a planning tool for area-based conservation of Arctic species and ecosystems: A case study on ice-dependent species*

[Annex 6](#)

**Co-leads:** Norway, Canada, Kingdom of Denmark, WWF (supported by a project steering group). Joint PAME/CAFF project.

**Rationale and overall objective:** To develop a tool for identifying and prioritizing Arctic areas of high conservation priority for sea ice-dependent species, taking into account climate change and human use. Ultimately, the proposed tool could be expanded to cover a wider selection of conservation features allowing for a more comprehensive pan-Arctic analysis to support the planning and development of a climate-resilient network of area-based conservation measures, such as Marine Protected Areas (MPAs), Other Effective Area-Based Conservation Measures (OECMs) and Indigenous Protected and Conserved Areas (IPCAs).

**Main activities:** The conservation planning tool will be developed through a cooperative process and a staged approach consisting of three phases: 1) horizon scan/scoping (Phase 1); 2) data portal and atlas (Phase 2); and 3) spatial prioritization app (Phase 3). Such a staged approach allows for an adaptive workplan and co-production with interested Permanent Participants (PPs) of the Arctic Council. It will be based on the best available, open and reproducible science, and will be made accessible through an interactive interface to allow user mapping of scenario-based results. The project will seek to actively include Indigenous Knowledge and local knowledge.

During Phase I of the project, both its content and partners will be further formulated, in addition to establishing an inclusive project group of experts.

**Timeline:** 2025-2029

**Funding:** Estimated \$931.589 USD for 2025-29 (TBC)

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### ***Other Effective Area-based Conservation Measures (OECM) in the Arctic Marine Environment - Phase II***

**Co-leads:** Kingdom of Denmark, Canada, USA. Joint PAME/CAFF project.

**Rationale and overall objective:** Continue to advance the OECM work as a follow-up to the OECM Report (2025) and as an important component of the PAME Conservation Network.

**Main activities:** The co-leads will explore potential follow-up activities of the OECM in the form of organizing a workshop to share lessons learned and address implementation challenges.

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** In-kind

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## ***Expansion and refinement of the MPA-Network Toolbox***

**Lead:** MPA Expert Group. Partners: CAFF, WWF, Circumpolar Conservation Union (CCU) (TBC)

**Rationale and overall objective:** Continue expanding and refining of the MPA-Network Toolbox to include findings and outcomes from projects such as the OECM project, the Different Ways of Knowing project, the connectivity modelling project, and other projects as relevant.

**Main activities:** This work will take into account outcomes from previous MPA workshops (4 workshops), the Modelling Arctic Oceanographic Connectivity study, updating exercise of the Framework for a Pan-Arctic Network of MPAs (2015), and work on other relevant projects from the 2021-2025 biennium.

**Timeline:** Ongoing/continuation from previous work plan.

**Funding:** In-kind

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## ***Information Briefs: The Arctic marine environment under change***

**Co-leads:** MPA Expert Group.

**Rationale and overall objective:** Continue to develop additional Information Briefs (IBs) on the Arctic marine environment under change with the aim to leverage and synthesize information from the Arctic Council's work on this topic, communicate to decision makers and the public, and contribute to cross-cutting WG cooperation on common topics.

**Main activities:** Details on areas of focus and scope will be worked out intersessionally and may include topics on e.g. Indigenous-led conservation and potentially on climate-informed planning and management. Information brief on Indigenous-led conservation would require the involvement of, and co-production by, Indigenous knowledge holders to capture the diverse perspectives and practices of Indigenous Peoples across the Arctic.

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** In-kind

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## ***Different Ways of Knowing: Applying Indigenous and Local Knowledge and Scientific Information to Arctic Conservation Planning - Phase II***

**Co-leads:** Canada, USA, AIA, ICC, Saami Council, WWF (co-leads TBC)

**Rationale and overall objective:** The co-leads will explore a possible continuation and/or follow up to the Different Ways of Knowing Report which will be published in 2025 by including additional case studies on Indigenous-led area-based management for conservation, focusing on holistic perspectives of ecosystem health.

**Main activities:** Details on focus and scope will be worked out intersessionally by the project co-leads and may include:

- Additional case studies
- Information Brief on Indigenous-led conservation.
- Communication and outreach efforts to share the final case studies with the communities involved and other relevant audiences.

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** in-kind

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## ***Climate-informed development and management of Arctic marine conservation networks: Workshop***

**Co-leads:** MPA Expert Group

**Rationale and overall objective:** PAME notes the importance of contributing to cooperation related to climate-informed conservation planning and management and decides to explore further the planning of a hybrid/virtual meeting with the aim to connect MPA planners and managers in the Arctic and discuss climate assessment, resilience and adaptation by highlighting tools, approaches and experiences to assess the vulnerability of marine ecosystems to climate change and adaptation actions and strategies to enhance the resilience of MPAs and conservation networks, including reducing non-climate stressors.

**Main activities:** Convening of a workshop as a hybrid or virtual option.

**Timeline:** 2025-2027

**Funding:** TBD

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## ***Ecosystem Status, Human Impacts and Management Measures in the Central Arctic Ocean - Phase II***

**Co-leads:** Canada, Finland, Sweden, USA, WWF

**Rationale and overall objective:** The co-leads will explore a possible continuation and/or follow up to the Synthesis Report on Ecosystem Status, Human Impacts and Management Measures in the Central Arctic Ocean (CAO-SR), including through reaching out to the ICES/PICES/PAME Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean (WGICA) and relevant PAME thematic expert groups.

**Main activities:** Details on scope will be worked out intersessionally.

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** In-kind

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## ***Arctic Whale Migratory Connectivity and Shipping Interactions***

**Lead:** MPA Expert Group

**Rationale and overall objective:** Develop an Arctic Whale Migratory Connectivity and Shipping Interactions project proposal intersessionally, with CAFF and Permanent Participants, including the identification of co-leads.

Synergies and linkages will be ensured between this activity and the project “Arctic Marine Tourism - Mapping Whale Watching Activities in Arctic Waters” from the Shipping Expert Group, and the project “Development of a planning tool for area-based conservation of Arctic species and ecosystems: A case-study on sea-ice dependent species.”

**Main activities:** Details on focus and scope will be developed intersessionally in close collaboration with CAFF and Permanent Participants.

**Timeline:** 2025-2027

**Funding:** TBD

## ECOSYSTEM APPROACH TO MANAGEMENT (5 ACTIVITIES)

### *7<sup>th</sup> EA Workshop: Value and Valuation of ecosystems*

**Lead:** Sami Council, ICC, EA co-chairs in close collaboration with the joint PAME, CAFF, AMAP and SDWG EA Expert Group,

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

**Main activities:** Seminars and meetings during 2025 and workshop fall 2025. Report writing 2026-2027.

**Timeline:** 2025-2027

**Funding:** \$30.000 USD

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### *The Ecosystem Approach (EA) Framework in the Arctic LMEs*

**Lead:** EA co-chairs in close collaboration with the joint PAME, CAFF, AMAP and SDWG EA Expert Group,

**Rationale and overall objective:** To discuss, exchange experiences and report on more refined developments of the EA Framework in the Arctic LMEs.

**Main activities:** International conferences, workshops and seminars to support the update of the EA Framework, followed by report development.

**Timeline:** Ongoing (continuation from previous work plan).

**Funding:** In-kind

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### *Implementing an Ecosystem Approach to Management of Arctic Large Marine Ecosystems: Update to the 2019 Guidelines*

**Lead:** EA co-chairs, in close collaboration with the joint PAME, CAFF, AMAP and SDWG EA Expert Group

**Rationale and overall objective:** Using the outcomes of the development of the EA Framework in the Arctic LMEs to update and refine the 2019 *Guidelines for an Ecosystem*

*Approach to Management of Arctic LMEs*, describing how to proceed step by step in implementing the Framework into practice.

**Main activities:** Report writing based on progress within the EA Framework in the Arctic LMEs activity.

**Timeline:** 2025-2027

**Funding:** In-kind

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### ***Information brief on the Central Arctic Ocean LME***

**Lead:** EA Co-chairs, in close collaboration with the MPA expert group and the joint PAME, CAFF, AMAP and SDWG EA Expert Group,

**Rationale and overall objective:** To develop one or more Information Brief on the CAO-LME, following the MPA information briefs in structure with the aim to leverage and synthesize factual information in layman's terms to communicate to decision makers and the public.

**Main activities:** The information brief(s) will draw from the WGICA latest reports on Integrated Ecosystem Assessment for the CAO and the CAO Synthesis Report, highlighting the impacts from pressures caused by human activities on marine ecosystem and species.

**Timeline:** 2025-2027

**Funding:** In-kind

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### ***Integrated Ecosystem Assessment (IEA) of the Central Arctic Ocean (WGICA)***

**lead:** Norway, in collaboration with Canada, Kingdom of Denmark, Finland, Sweden.  
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:** Report 2 (human activities), Climate Assessment Report, Terms of References for 2026-2028.

**Timeline:** Ongoing (continuation from previous work plan).

**Funding:** In-kind

## MARINE LITTER IN THE ARCTIC (7 ACTIVITIES)

### *Implementation of the Regional Action Plan on Marine Litter in the Arctic (ML-RAP)*

**Co-leads:** Kingdom of Denmark, Finland, Norway, USA

**Rationale and overall objective:** To provide a structured approach that tracks follow-up activities (ongoing and planned) in close coordination and cooperation with other Arctic Council members and working groups and report on marine litter-related activities across the Arctic Council WGs and Arctic States, including the integration of marine litter activities in multiple WG work plans. Co-leads will also engage with Indigenous Peoples and local communities and relevant stakeholders.

**Main activities:** To map completed, ongoing and planned ML activities in the Arctic marine for the period 2025-2027 to assist in the development of Arctic Council ML activities going forward. Submit the ML-RAP tracking matrix to Arctic Council Member States, Permanent Participants and Observers in May 2026, seeking their inputs. Develop a status report which will be a cross-cutting WG effort with the aim to convey the status of ML-RAP Strategic Actions. This report will also inform biennial WG work plans and include domestic activities as well as Arctic Council projects.

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** In-kind

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### *Arctic Coastal Cleanup project*

**Lead:** Norway. Arctic States and PPs are welcome to co-lead.

**Rationale and overall objective:** The project will continue to contribute to enhancing efforts to remove litter from Arctic beaches and waterways. The project will establish partnerships with local organizations, community leaders and regional experts to increase the knowledge and awareness of the problem throughout the Arctic, contributing to reducing discharges of marine litter to the Arctic in the long term.

The key objectives are to:

- Engage volunteers in cleanup efforts in the Arctic region.
- Gather knowledge on litter through citizen science and data collection.
- Develop and maintain a protocol tailored to voluntary cleanup efforts in the Arctic.

- Disseminate knowledge about litter locally and regionally.
- Foster collaboration among cleanup partners in the Arctic and strengthen local partnerships through funding and coordination.

**Main activities:** The main activities in Arctic cleanup are volunteer cleanups, citizen science data collection, and network building among local partners in the Arctic. Local cleanup organizations in Alaska, Greenland, Norway, Iceland and Canada will arrange local cleanup activities and gather data through with the Arctic Cleanup protocol. Digital meetings and fieldwork aim to strengthen the network and cooperation. The project will continue cleanup activities in cooperation with partners, involve more local partners and governments, and increase communication of the projects and its results.

**Timeline:** 2025-2027 (continuation from previous work plan).

**Funding:** TBD

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***Fishing Gear Management Plan in the Arctic (FGMP)  
Preventing loss of fishing gear parts and net cuttings from fisheries in the Arctic and Near-Arctic – Fishing Gear Management Plan (FGMP)***

[Annex 7](#)

**Co-Leads:** Kingdom of Denmark, Canada, Norway and Iceland

**Rationale and overall objective:** This project serves as an implementation activity under the theme “Reducing Marine Litter from Fisheries and Aquaculture” in the Regional Action Plan on Marine Litter in the Arctic ([ML-RAP](#)). It builds on the findings from the Abandoned, Lost, or Otherwise Discarded Fishing Gear (ALDFG) project to develop new proposals for guidance for management of fishing gear on board fishing vessels in the Arctic. The output from the project is intended to contribute to ongoing processes in IMO regarding new requirements for planning of onboard management of fishing gear.

The key objectives are to:

- Create a deeper understanding of the sources and causes of fishing gear litter in the Arctic and Near-Arctic in order to more effectively address the issue
- Develop proposal for FGMPs adapted to Arctic conditions for different fisheries.
- Ensure synergies with other international processes, and benefits for the IMO’s efforts to develop measures to reduce littering from fishing vessels, and,

- Create a platform for dialogue and cooperation between Arctic States and with fishing industry regarding the issue of lost fishing gear parts and net cuttings

**Main activities:** Analysis of existing knowledge on fisheries, and sources and causes of marine litter in the Arctic and Near-Arctic, stakeholder engagement including involvement of fishing industry, researchers, NGOs, policymakers, ports, gear manufacturers, etc., and writing of a report describing current status for fisheries and identified marine litter from fisheries in the Arctic, why parts of fishing gear end up in the sea and how a “fishing gear management plan” can be adapted to Arctic conditions to prevent marine litter. The outcome from Marine Litter workshop in late 2025 will contribute to the development of this project.

This project will also include a meeting or a workshop with representatives from Arctic States and fishing industry from the Arctic and Near-Arctic. This is important to increase the understanding of current practices and routines, and relevant challenges, and to facilitate dialogue on these issues.

**Timeline:** 2025-2027 (follow up to the ALDFG project)

**Funding:** 500 000 NOK (TBC) and in-kind

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## ***ALDFG and Fisheries Waste Management Workshop***

### [Annex 8](#)

**Co-leads:** Kingdom of Denmark, Norway, Iceland, Netherlands

**Rationale and overall objective:** The overall objective is to support the work of the Arctic Council and the Arctic States in their efforts to reduce ALDFG in the Arctic marine environment, prevent the potential negative impacts and mitigate the risks it may pose.

The workshop will support previous and ongoing work by PAME and the Arctic Council on the topic of ALDFG and Fisheries Waste Management. The workshop will contribute to the project on FGMP in the Arctic. Fisheries representatives, policymakers, researchers, NGOs and other experts will be invited to the workshop. The focus will be on providing an overview of current knowledge and identifying knowledge gaps related to waste management practices on board fishing vessels operating in the Arctic. Location and timing of the workshop is to be determined (tentative late fall 2025).

**Main activities:** Establish a planning team to prepare the workshop which is intended to focus on topics such as:

1. providing an overview of current knowledge and identifying knowledge gaps related to waste management practices on board fishing vessels operating in the Arctic, and

2. contributing to the development of the project idea on fishing gear management proposed by Norway, including defining activities, outputs, roles, and potential partners.

The planning team will develop additional themes for the workshop in close collaboration with the FGMP project.

**Timeline:** 2025-2027

**Funding:** TBD

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### ***Information Brief on Marine Litter in the Arctic***

**Lead:** ML Expert Group

**Rationale and overall objective:** To explore the possibility of developing an Information Brief on Marine Litter in the Arctic with the aim to leverage and synthesize information from the Arctic Council's work on this topic, communicate to decision makers and the public, and contribute to cross-cutting WG cooperation on common topics.

**Main activities:** Details on focus and scope will be worked out intersessionally by the ML expert group members.

**Timeline:** 2025-2027

**Funding:** In-kind

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### ***Marine Litter Communication Plan and Outreach Activities***

**Lead:** PAME Secretariat

**Rationale and overall objective:** Continue outreach and communications activities of PAME's work on marine litter in the Arctic.

**Main activities:** Continue the [Plastic in a Bottle initiative](#) and explore other outreach and communication opportunities.

**Timeline:** 2025-2027 (continued from previous WP)

**Funding:** In-kind

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## **3rd International Symposium on Plastic pollution in the marine environment 2026**

**Lead:** Iceland (TBD)

**Rationale and overall objective:** To convene the 3<sup>rd</sup> International Symposium on Plastic pollution in the marine environment in 2026 following the success of the 1<sup>st</sup> Symposium on Plastic Pollution in the Arctic and Sub Arctic Region, and the 2<sup>nd</sup>, held in 2021 and 2023. More information on <https://www.arcticplastics.is>

Like the first and the second symposia, the third plastics symposium will be organized in cooperation with international partners and bring together scientists, practitioners, decision makers and other stakeholders. The organizers aim to broaden the scope of this third edition, by extending invitations to scientist focusing on the Atlantic Ocean from North to South, thus highlighting that plastic pollution is an ocean-wide concern.

**Main activities:** TBD

**Timeline:** 2025-2027

**Funding:** TBD

## RESOURCE EXPLORATION AND DEVELOPMENT (5 ACTIVITIES)

### ***Arctic Mining Inventory: overview of regulatory, operational, and environmental Information for coastal mining***

[Annex 9](#)

**Co-leads:** Kingdom of Denmark, Canada, PAME Secretariat

**Rationale and overall objective:** A centralized database is needed to summarize and consolidate information on mining operations across the Arctic that have potential impacts on coastal and marine environments. This resource would provide regulators, industry, and stakeholders with easy access to details about regulations and legal frameworks in different Arctic States, inventories of current and approved mining operations, and information on environmental management practices. Such a database would promote knowledge sharing among Arctic States and serve as a valuable tool to inform the sustainability and regulatory aspects of mining in the Arctic.

**Main activities:**

- Collect all relevant data and materials from interested Arctic States, Permanent Participants and Observers to be included in the web portal. This includes compiling regulatory information (for example, relevant laws, mineral rights,

environmental/impact assessment processes etc.), information from the workshop, survey responses, and any additional technical or environmental details (for example, biodiversity concerns, impacts of mining infrastructure on the marine environment, impacts of shipping related to the mining industry etc.). Ensure the data is well-organized and formatted for integration into the portal. Work with the PAME Secretariat and potentially a web designer to develop the portal. Ensure that the platform is accessible, user-friendly and structured for easy navigation.

- Share a draft version of the web portal with Arctic States for review. Gather feedback on the content, functionality, and usability of the platform. Address any identified gaps, inaccuracies, or technical issues based on their input.
- Review web portal on an ongoing basis, asking Arctic States to update their information every 2 years (in the 1st year of the two-year Work Plan).

**Timeline:** 2025-2027

**Funding:** In-kind

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### ***Arctic Offshore Oil and Gas Regulatory Resource (AOOGRR)***

**Co-leads:** REDEG co-chairs, PAME Secretariat

**Rationale and overall objective:** The AOOGRR provides easily accessible and updatable web-based information and data (e.g., documents, websites, relevant fora, networks, etc.). The AOOGRR facilitates the sharing of current information on best practices from different Arctic States and allows for better communication in the management, regulation and enforcement of Arctic offshore oil and gas operations, by ensuring easy access to information for all stakeholders.

**Main activities:**

1. Review the AOOGRR for outdated or broken links.
2. Add relevant new websites or links.
3. Seek clarifications from Arctic States on website questions.

**Timeline:** Ongoing (continuation from previous work plan).

**Funding:** In-kind

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## ***Management of Arctic Marine Oil and Gas Associated Noise – Phase II***

**Co-leads (TBC):** USA, United Kingdom, WWF

**Rationale and overall objective:** Potential phase II as a follow up to the Management of Arctic Marine Oil and Gas Associated Noise Report (2025).

**Main activities:** Potential next steps include:

- Consider developing an addendum to PAME’s Arctic Offshore Oil and Gas guidelines focused on noise.
- Share information through an “Innovation Forum” regarding emerging technological approaches to reduce noise impacts, monitor underwater noise, or determine the presence of marine species.
- Consider how PAME’s MEMA work is applicable to noise-generating activities and if additional work on engagement of Arctic Indigenous Peoples before, during, and after noise-generating activities would be useful.
- Coordinate with the co-leads on the underwater noise from Arctic shipping project, under the Shipping Expert Group, to identify potential synergies.

**Timeline:** 2025-2027 (continuation from previous Work Plan)

**Funding:** In-kind

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## ***The status of non-living marine resource exploration and development across the Arctic***

**Lead:** REDEG co-chairs, PAME Secretariat

**Rationale and overall objective:** The Resource Exploration and Development Expert Group (REDEG) has historically focused on offshore oil and gas, but new and emerging resources in the Arctic also require REDEG attention. Nascent technologies, alternative energy, and carbon management methods (i.e., sub-seabed carbon sequestration and marine carbon dioxide removal) are all being considered for deployment, which could contribute to energy diversification, environmental resilience, risk reduction, and economic opportunities in the Arctic. However, similar to offshore oil and gas, community concerns and environmental impacts must be thoroughly evaluated and addressed. This project would assess the status and summarize knowledge of marine energy, mineral, and geological resource activities in the Arctic States, laying the foundation for future exchanges on experiences and lessons learned as relatively new, non-living resources are explored and/or developed. The main objectives are:

1. Compile information on the status of non-living marine resource exploration and development in the Arctic. This includes inventorying relevant projects and activities in Arctic States’ marine environments (past, present, and planned).

2. Inform the direction of future REDEG work, including potential environmental considerations and multi-use marine management.

**Main activities:**

- Conduct a desktop literature review to develop an overview of new and existing non-living resources in marine environments, including benefits, risks, uncertainties, etc.
- Gather information on current and planned projects in Arctic States through researching publicly available information and interviewing or surveying key regulatory agencies in each State, as appropriate.
- Collect and summarize data in tables and maps.
- Develop a report, based on the information gathered, on the current and potential near-term state of non-living marine resource activities in the Arctic marine environment.

**Timeline:** 2025-2027

**Funding:** In-kind

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### ***Meaningful Engagement of Indigenous Peoples and Local Communities in Marine Activities (MEMA)***

**Co-leads (TBC):** REDEG co-chairs in close collaboration with AIA, ICC, Saami Council

**Rationale and overall objective:** To continue and finalize the MEMA project from previous work plan.

**Main activities:** Follow-up activities including:

- Review and update the MEMA Reference Guide and Information Database for the inclusion of new information as relevant.
- Translate the MEMA Reference Guide and Brochure into Indigenous languages.
- Develop culturally relevant outreach materials and communication.

Further details, including funding and resource needs, as well as additional opportunities for MEMA-related work, will be developed intersessionally by project co-leads in close collaboration with REDEG.

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** In-kind (to be evaluated)

## PROTECTION FROM INVASIVE ALIEN SPECIES (1 ACTIVITY)

### *Marine Invasive Alien Species in Arctic Waters: Phase II*

**Co-leads:** Canada, Kingdom of Denmark. Joint PAME/CAFF project

**Rationale and overall objective:** Contribute to the implementation of the Arctic Invasive Alien Species Strategy and Action Plan (ARIAS 2017) by improving the knowledge base for CAFF and PAME on specific actions in the ARIAS Strategy and Action Plan that focus on the risk of potential transfer of alien invasive species by ships via ballast water (BW) and biofouling (BF) into and within Arctic waters.

**Main activities:** Follow up to the Identification and risk assessment of Arctic Marine Invasive Species report (2025) and build on and continue the work of Phase I to include monitoring, detection, registration of nonindigenous species, analysis of ship traffic to and from the Arctic and risk assessment.

**Timeline:** 2025-2027 (continuation from previous work plan)

**Funding:** In-kind

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## ARCTIC MARINE STRATEGIC PLAN (2 ACTIVITIES)

### *Targeted updating of the Arctic Council Arctic Marine Strategic Plan (AMSP)*

**Co-leads:** Canada, Norway, USA. Partners: All Arctic Council Working Groups.

**Rationale and overall objective:** Targeted update of the 2015-2025 AMSP.

1. Update strategic actions of the AMSP and integrate new ones, as relevant, to reflect the changes underway in the Arctic marine environment; and,
2. Enhance integration, coordination, and collaboration on marine-related activities among the AC WGs.

**Main activities:** An outreach and scoping phase will be developed to focus the update on priority topics as identified by Ministerial and SAO priorities and mandates. Representatives from the other Arctic Council WGs, PPs and other relevant stakeholders will be invited to contribute towards updating the AMSP. The project includes:

1. Identifying some potential new thematic areas of work and develop an annotated list of possible strategic actions; and,

2. Convening virtual meetings with the Arctic Council WGs to seek additional inputs and feedback from the WGs.

**Timeline:** 2025-2027 (Continuation from previous WP)

**Funding:** \$175.000 USD and in-kind

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### ***Implementation of the Arctic Council Arctic Marine Strategic Plan: 4<sup>th</sup> Status Report***

**Co-leads:** PAME HoDs, PAME Secretariat in collaboration with all Arctic Council Working Groups.

**Rational and overall objective:** To track progress on implementation of the AMSP 40 Strategic Actions and report on its status.

**Main activities:** The project will develop the 4<sup>th</sup> “AMSP Implementation Status Report” in collaboration with other Arctic Council WGs for the period 2025-2027 for submission to the 15<sup>th</sup> Arctic Council meeting in 2027.

**Timeline:** 2025-2027 (from previous work plan)

**Funding:** In-kind

## **CAPACITY BUILDING, OUTREACH, COOPERATION**

1. Strengthen information outreach and cooperation and collaboration with international and regional organizations and to build the capacity and engagement of indigenous communities and other Arctic inhabitants.
2. Liaise and exchange information with relevant organizations and programs (e.g. UNEP Regional Seas Programme), and other regional programs.
3. Encourage activities and proposals from Permanent Participants.
4. Strive for the development of outreach and communication efforts and plans for PAME’s activities (e.g. through updates on the PAME homepage, brochures, roll-up stands, other communication material).

**Leads:** PAME Chair - PAME Secretariat

# Annex 1: Wastewater Discharges from Ships in the Arctic (Phase II) - Quantification and Best Practices

## Project summary

Building on the work conducted during Phase I (of the project "Survey of Select Wastewater Discharges"), Phase 2 consists of a quantitative analysis of vessel wastewater production in the Arctic<sup>1</sup> and the creation of wastewater best practices for ships operating in the region.

The quantitative analysis will inform policymakers and other stakeholders about the amounts and distribution of sewage, grey water and scrubber wastewater generated and potentially discharged each year by ships in Arctic waters. The results will include a breakdown of the amount of waste produced by each ship type as well as the amount produced within bounded areas (e.g., [Arctic Large Marine Ecosystems \(LME\)](#)). Outputs will include a written synopsis of the analysis and results, high resolution map figures, and summary tables.

Simultaneously, recommended best practices for wastewater in Arctic waters, developed in consultation with ship operators and wastewater treatment experts, can be used to inform industry on ways to lessen impact on the Arctic marine environment. These best practices will provide those operating in the Arctic with tools to mitigate the negative impacts of wastewater discharges on Arctic peoples, wildlife, and the marine environment. The results of the quantitative analysis and the recommended best practices will be submitted to the IMO as an information paper.

## Background

The impacts from shipping can be severe and the risks real to both marine habitat and Indigenous and community food security in the Arctic. Risks can be equally high if essential goods and development do not reach people in the Arctic. The challenge for policy makers is to get the rules right to decrease ship impacts while ensuring opportunities for people in the Arctic. Part of contributing to effective management and regulation of shipping is being on top of emerging social and environmental issues early, to give operators plenty of lead time for adaptive management, which will reduce impacts as soon and as effectively as possible. Wastewater discharge from ships, including grey water, sewage, and exhaust gas cleaning system (scrubber) effluent, is one such issue.

Phase 2 follows phase 1, of the project Survey of Select Wastewater Discharges, that was included in the PAME Work Plan 2021-2023. The main goal of phase 1 was to gain a better understanding of vessel practices related to wastewater discharges in the Arctic,

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<sup>1</sup> Arctic Human Development Report boundary of the Arctic

through a survey directed at shipping operators and associations. The findings of both phases inform potential future dialogue on discharge reductions within the Arctic Council as well as ongoing discussions at the IMO.

## Key Objective(s)

To have a quantitative analysis of wastewater discharges in Arctic waters, and to produce recommendations for wastewater best practices for ships operating in the region.

## Scope

The Project Team (co-leads and steering committee members) will meet on a regular basis throughout the duration of this project. The tasks outlined below are intended to reflect the conceptual framework.

## List of Tasks/Activities

This work will provide Indigenous Peoples and Arctic stakeholders including industry, and national governments, amongst others, with estimates of the volume of wastewater produced and discharged into Arctic waters on an annual basis based on real-life ship traffic and attribute data. In turn, this will facilitate dialogue about enhancing the sustainability of marine shipping in high latitude regions, and will augment a discussion on, and the use of, best practices.

### **For quantitative modelling of operational waste production:**

- 1. Obtain the services of modelling expert.**
- 2. Technical briefing and feedback.** The Project Team will be briefed on the model methodology by the modelling expert and a list of desired outputs (i.e., specific values, figures, and tables) will be agreed upon.
- 3. Execute the model and share preliminary results.** The quantitative model will be run and preliminary results will be extracted and shared with the Project Team for review.
- 4. Draft report - I.** Based on the results, the co-leads will prepare a summary report complete with figures and tables indicating the amount and distribution of operational wastewater produced by shipping in the pan-Arctic. The report will be shared with the Project Team for review and feedback.
- 5. Draft report - II.** The co-leads will produce a refined draft taking into account the feedback provided by the Project Team on the draft report. This iteration will be open for input and review by the SEG.
- 6. Dissemination of final report and results.** Following approval of the final report and associated package of outputs, the results will be shared with the ASBPIF and submitted to the IMO as an information paper. The report will also be widely shared with Indigenous Peoples and stakeholders such as industry, and governments.

## **For best practices:**

Recommended best practices will provide those operating in the region with tools to mitigate their wastewater discharge impacts on Indigenous Peoples and the marine environment. The work will proceed as follows:

- 1. Scope of work.** The project team will develop the criteria and scope of work for an expert contractor, relying on expertise from the project co-leads and steering committee members.
- 2. Obtain expert contractor.** An expert in ship operations and wastewater treatment will be hired to draft recommended best practices for ships operating in Arctic waters. The contractor will consult with relevant industry and wastewater treatment entities to ensure viability of the recommendations for relevant stakeholders. Available guidance documents, if any, will be taken into account, as appropriate.
- 3. Draft Report.** Draft best practices will be circulated for review for input and revision by the SEG. Input will be incorporated into a final draft.

## **Dissemination of final recommendations**

Following approval of the final report and associated package of outputs, the results will be submitted to the IMO as an information paper. It will also be shared with the broader shipping community, particularly ship operators and community members.

## **Timeline and Major Milestones**

- Review of draft quantitative assessment - Summer 2024
- Completion of quantitative assessment - Autumn 2024
- Review of draft best practices document - Autumn 2024
- Completion of best practices document - Autumn 2024
- Approval by PAME - Winter 2025
- Submission to IMO - Spring 2025

## **Budget**

Consistent with the overall Arctic Council approach, the development of this project will be financed through both direct and in-kind contributions from the project co-leads.

<b>Item</b>	<b>Budget (USD/in-kind)</b>
Project management and coordination	40.000
Consulting fees	45.000
Data gathering and analysis	15.000
Dissemination of final report and recommendations	20.000
<b>Estimated total</b>	<b>120.000</b>

## Project Team/lead(s)

The project is co-led by Iceland, ICC, WWF, and CCU. The project steering committee consists of:

- Iceland, Sigurros Fridriksdottir, Advisor, Environment Agency of Iceland
- World Wide Fund for Nature (WWF), Sam Davin, Advisor
- Circumpolar Conservation Union (CCU), Sarah Bobbe, Advisor
- Inuit Circumpolar Council (ICC), Andrew Dumbrille, Advisor
- China, Hongying Zhao, Professor, Tongji University; Zhibo Lu, Professor, Tongji University; Fan Yang, Senior Engineer, Marine Design & Research Institute of China
- Association of Arctic Expedition Cruise Operators (AECO), Melissa Nacke, Head of Operations

## Permanent Participants engagement

- Have Permanent Participants been engaged in the development of the project proposal?

Yes, they are a co-sponsor.

- Will the use of Indigenous Knowledge lead to better project outcomes?

ICC will attempt to bring a perspective from Inuit communities and knowledge holders, with an emphasis on how wastewater discharges can impact food security, hunting rights, and ocean health. As well, it will study how efforts to mitigate these impacts would benefit and contribute to community wellbeing.

# Annex 2: The Development of a Regional Reception Facilities Plan

## Project summary

- Regional Reception Facilities Plan (RRFP) will include ports and terminals of Arctic states which will participate in the proposed RRFP, and ports identified in the RRFP as Regional Ships Waste Reception Centre (RSWRC) as well as all other necessary information to be required by 2012 Guidelines for the Development of a Regional Reception Facilities Plan.

## Background

- Adapted AMSA Recommendations III(A) (May 2021) addressed the infrastructure deficit: “That the Arctic states should continue to recognize that improvements in Arctic marine infrastructure are needed to enhance safety and environmental protection in support of sustainable development. Examples of infrastructure where critical improvements remain necessary include: ice navigation training; navigational charts; communications systems; aids to navigation, *port services, including reception facilities for ship-generated waste*; accurate and timely ice information (ice centers); meteorological forecasts; places of refuge; and icebreakers to assist in response.”
- The resolutions MEPC.359(79), MEPC.360(79) and MEPC.362(79) adopted amendments to MARPOL Annexes I, II, IV, V and VI, respectively, to provide for regional arrangements as an acceptable way to satisfy MARPOL obligations to provide port reception facilities for States the coastline of which borders on Arctic waters, provided that regional arrangements shall cover only ports within Arctic waters of those States, where a Regional Reception Facilities Plan has been developed taking into account the Guidelines developed by the Organization.
- The development of a Regional Reception facilities Plan is obligation for those States who are participating in a regional arrangement for port reception facilities.

## Key Objective(s)

- Identification of the region to be covered by a RRFP
- Identification of the nature of the unique circumstances that impact on the ability to provide adequate port reception facilities
- International and domestic shipping and the needs of ships operating in the region to discharge ship generated wastes and cargo residues
- All ports in the region, including type and available facilities
- Identification of the selected Regional Ships Waste Reception Centres (RSWRC)
- Identification of ports with limited facilities (PLF)
- Identification of a central point of contact

- Identification of stakeholder roles and responsibilities
- Period of review
- Description of consultations undertaken with stakeholders in developing an RRF

## Scope

This project will continue the project “Arctic Arrangements for Port Reception Facilities” (USA, Russian Federation), within the framework of which the relevant amendments to the MARPOL were prepared and take into account the result of project “Arctic Port Reception Facilities Inventory” (USA).

## List of Tasks/Activities

- RRF should be developed upon the entry into force of the amendments to MARPOL Annexes I, II, IV, V and VI on regional arrangements for port reception facilities. Relevant amendments regarding regional reception facilities within Arctic waters entered into force on 1 May 2024.
- The correspondence group (CG) should be established for implementation of this project. All Arctic states are invited to submit all necessary information.
- GISIS IMO and Arctic Port Reception Facilities Inventory will also review for obtaining background information for implementation this project.
- The Arctic States should consider and approve the identification of the Regional Ships Waste Reception Centres (RSWRC)
- CG will hold the virtual meetings for consideration of the ongoing status project as well as outstanding issues.
- Permanent Participants are invited in the implementation of the project, especially in exchanging, if appropriated, the knowledge regarding the treating, reusing, recycling, destroying or otherwise managing ship generated wastes and cargo residues collected by waste transporters.

## Timeline and Major Milestones

Actions		Time
1.	Established the CG	2025
2.	Collection and analyses of necessary information	2025-2026
3.	Consideration and approval of RSWRC	2026
4.	Prepare the final report, including the RRF	2026-2027
5.	Prepare rhw joint document to MEPC IMO	2027 (MEPC 86)

## Budget

Item	Budget (USD/in-kind)
Project management and coordination	will be determined
Preparation of reports and document to IMO	will be determined
Estimated total	will be determined

*Note: Consistent with the overall Arctic Council approach, the development of this project will be financed through voluntary contributions (in-kind) Project.*

## Team/lead(s)

- Russian Federation in collaboration with other Arctic States, Permanent Participants and observers.

## Permanent Participants engagement

- Have Permanent Participants been engaged in the development of the project proposal?
  - No (the project is based on the obligations of the Contracting Parties to MARPOL):
- Will the use of traditional and local knowledge (TLK) lead to better project outcomes?
  - Yes (knowledge, if appropriated, in the field of treating, reusing, recycling, destroying or otherwise managing ship generated wastes and cargo residues collected by waste transporters).

# Annex 3: POLARIS: Data collection and evaluation

## Project Summary

This project will collect information from ships using the Polar Operational Limitation Assessment Risk Indexing System (POLARIS), a key methodology for assessing ice operational risk and an integral tool of the IMO Polar Code. The POLARIS methodology was agreed at IMO as 'interim guidance' providing for a review four years after the entry into force of the Polar Code in 2017, in order to make any necessary amendments based on experience gained. To date no review has taken place, and the aim of this project is to collect data and evaluate it against the POLARIS methodology in order to inform the formal IMO review process. This will strengthen safety of navigation and protection of the marine environment in the Arctic.

To facilitate the project, information is required to be collected from vessel operators and/or maritime administrations, followed by an evaluation, with a Summary Report prepared with a view to informing an eventual IMO POLARIS Review. The project will seek relevant experts from all PAME Members (including PPs) as well as industry, to participate in a project correspondence group. This group will oversee the collection and evaluation of data and information and will develop a Summary Report.

With support from the PAME Secretariat, the data will be formulated and stored on a specific section of the PAME website to allow access for researchers and others interested in POLARIS. No data will be shared without authorization from relevant Administrations.

The group will meet regularly and report back to PAME, as well as PAME's Arctic Shipping Best Practice Information Forum and the IMO, as needed.

This project supports many recommendations from the AMSA Report, which were updated in 2019, strategic actions from the Arctic Marine Strategic Plan, and links to other projects within PAME, such as the Arctic Shipping Best Practice Information Forum.

## Background

Ships operating in polar waters require a Polar Ship Certificate, including identification of the ice regime methodology used for operational limitations, issued by its flag administration or its authorized representatives, attesting that the ship complies with the ship safety requirements in Part I-A of the Polar Code. The IMO issued [IMO Circular.MSC.1/Circ.1519](#) which contains POLARIS, a key methodology for assessing ice operational risk and is an integral tool of the IMO Polar Code to strengthen safety of navigation, and protection of the environment.

This methodology ensures that the vessel is capable of navigating in the ice conditions anticipated for each operation.

POLARIS provides a standard approach for the evaluation of risks to the ship in the ice conditions expected to be encountered by providing a risk index in any geographical area that the ship is intending to travel. This is a system similar to the established Canadian Ice regime, and effectively creates a Polar ice regime, drawing also on the very experienced Finnish- Swedish Baltic system, and the Russian system, with heavy input from those jurisdictions.

In brief POLARIS uses a Risk Index Outcome (RIO) value to assess limitations for operation in ice. For each geographical area encountered the Risk Index Values (RIV) assigned to the ship, based on the ice class, are used to determine a RIO that forms the basis of the decision to operate or limitation for operation. If the RIO is Zero or Positive the ship can proceed. If the RIO is between -1 and -10 the ship can proceed subject to certain limitations (e.g. speed restrictions). If the RIO is below -10 the ship is subject to additional operational requirements based on ice class.

Risk Values inputs are from IMO MSC.1/Circ.1519, illustrated below.

Polar Ship Category	ICE CLASS	Winter Risk Values (RVs)											
		ICE FREE	NEW ICE 0-10 cm	GREY ICE 10-15 cm	GREY WHITE ICE 15-30 cm	THIN FIRST YEAR 1ST STAGE 30-50 cm	THIN FIRST YEAR 2ND STAGE 50-70 cm	MEDIUM FIRST YEAR 1ST STAGE 70-95 cm	MEDIUM FIRST YEAR 2ND STAGE 95-120 cm	THICK FIRST YEAR 120-200 cm	SECOND YEAR 200-250 cm	LIGHT MULTI YEAR 250-300 cm	HEAVY MULTI YEAR 300+ cm
A	PC1	3	3	3	3	2	2	2	2	2	1	1	
	PC2	3	3	3	3	2	2	2	2	1	1	0	
	PC3	3	3	3	3	2	2	2	2	1	0	-1	
	PC4	3	3	3	3	2	2	2	2	1	0	-1	-2
	PC5	3	3	3	3	2	2	2	2	1	-1	-2	-2
B	PC6	2	2	2	2	1	1	0	0	-1	-2	-3	-3
	PC7	2	2	2	2	1	1	0	0	-2	-3	-3	-3
C	IAA	3	2	2	2	2	1	0	0	-2	-3	-4	-4
	IA	3	2	2	2	1	0	-1	-2	-3	-4	-5	-5
	IB	3	2	2	1	0	-1	-2	-3	-4	-5	-6	-6
	IC	3	2	1	0	-1	-2	-3	-4	-5	-6	-7	-8
	No Ice Class	3	1	0	-1	-2	-3	-4	-5	-6	-7	-8	-8

To date, data collection and formal evaluation of the effectiveness of POLARIS has been limited to isolated university-based studies which have typically focused on single ship experiences / load monitoring. No known coordinated or comprehensive review has taken place. Feedback from ship operations has not been forthcoming. As such the maritime community, including Indigenous Peoples, and the Arctic States that rely on the Polar Code (and through it, the use of POLARIS) to ensure safety of shipping in their waters and protection of the environment, have limited understanding of the suitability of POLARIS, both as an operational tool and as a component of maritime regulation.

To understand the effectiveness of POLARIS as an operational tool in order to identify any needs for refinement, as envisaged by IMO, and to support developments in safe and efficient Arctic shipping, data must be gathered, evaluated and conclusions fed back to the Arctic States, their maritime administrations, the IMO and the shipping industry.

## Key Objectives

- i) To establish a correspondence group with relevant experts, including Indigenous Peoples and experts from industry and research institutions, to identify what information is necessary to conduct a review of POLARIS.
- ii) To collect this information from operators with the assistance of Arctic States and Observer State administrations.
- iii) To evaluate the information collected to understand the effectiveness of POLARIS as an operational tool.
- iv) To identify any needs for refinement.
- v) To complete a Summary Report

## Scope and relevance to PAME's work

The project Correspondence Group will decide what data or information is needed to fulfil the project objectives. This will include information on which ships use POLARIS, and details on experience gained in each navigation. The information could be made available directly from industry, or through maritime administrations, and will include ships navigating inside the Arctic Polar Code area beyond 1 January 2017.

The project contributes to the PAME approved [AMSA recommendations I\(B\): IMO Measures for Arctic Shipping](#), which is for the Arctic States to “...cooperatively support efforts at IMO to strengthen, harmonize and regularly update international standards for vessels operating in the Arctic.”

The project contributes to the [Arctic Council Arctic Marine Strategic Plan](#), Strategic Actions 7.1.8: “Improve awareness of Arctic shipping activity and its impacts, promote expanded information sharing of ship traffic data among Arctic states and, as appropriate, other stakeholders, and update selected parts of the 2009 Arctic Marine Shipping Assessment (AMSA) Report, including those pertaining to the volume, composition and destination of Arctic shipping, shipping impacts, and key infrastructure needs such as hydrographic surveying and nautical charting.”

And Strategic Action 7.3.5: “Develop recommendations for consideration by Arctic states to promote maritime safety and environmental protection with the objective of reducing risks related to international shipping activities in Arctic waters.”

## Timeline

- Fall 2023: Intersessional PAME Approval
- Fall 2023: First meeting of Correspondence Group
- 2024: Data Collection and Analysis
- 2025: Completion of Final Report

## Budget

Consistent with the overall Arctic Council approach, the development of this project will be financed through voluntary contributions and in-kind support from the project co-leads as well as from PAME members and others as relevant in accordance with the Arctic Council Observer Manual for Subsidiary Bodies.

Item	Budget (USD (in-kind))
Project management and coordination	5.000
Reporting	25.000
<i>Total</i>	30.000

## Main Outcomes

The project will gather relevant data and information, evaluate that information, conclude with a report to PAME, and will include, if/as necessary, recommendations on necessary amendments based on experience gained. All data will be made available on the PAME website.

## Project Co-Leads

Canada, IMO.

# Annex 4: Designated Potential Places of Refuge for Vessels in Need of Assistance in the Arctic: An Inventory

## Project summary

According to the International Maritime Organization (IMO),<sup>2</sup> when a ship has suffered an incident, the best way to prevent pollution from its progressive deterioration is to transfer the ship's cargo and fuel, if possible, and repair the damage. If the ship cannot safely reach a port with the necessary infrastructure, temporary repairs are best carried out in a place of refuge.

Many Arctic States have officially designated potential places of refuge for ships in need of assistance. This project aims to create an Arctic-wide inventory of those officially designated places and disseminate that inventory broadly to Arctic stakeholders and the public.

## Background

The Arctic Marine Shipping Assessment (AMSA) Recommendation III(A) provides:

That the Arctic states should recognize that improvements in Arctic marine infrastructure are needed to enhance safety and environmental protection in support of sustainable development. Examples of infrastructure where critical improvements are needed include: ice navigation training; navigational charts; communications systems; port services, including reception facilities for ship-generated waste; accurate and timely ice information (ice centers); **places of refuge**; and icebreakers to assist in response. (Emphasis added.)

No single pan-Arctic inventory of all officially designated potential places of refuge for ships in need of assistance exists. The proposed project would create such an inventory and make it publicly available on PAME's website to aid regulators, mariners, marine insurers, and other Arctic maritime stakeholders. If appropriate, the inventory would be submitted by one or more Arctic States as an information paper to a relevant meeting of an IMO Committee or Sub-Committee.

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<sup>2</sup> See IMO, "Places of refuge" - addressing the problem of providing places of refuge to vessels in distress, at <https://www.imo.org/en/OurWork/Safety/Pages/PlacesOfRefuge.aspx>. On 6 December 2023, the IMO Assembly adopted revised *Guidelines for Ships in Need of Assistance*, [A.33/Res.1134 \(11 December 2023\)](#). The Assembly Resolution invites Governments to take the revised *Guidelines* into account, as a matter of priority, when determining and responding to requests for places of refuge from ships in need of assistance.

## Key Objective(s)

Create a single pan-Arctic inventory of all officially designated potential places of refuge in the Arctic for ships in need of assistance.<sup>3</sup> Note that if the project is approved, the USA would seek co-sponsorship from IMO.

## Scope

This project would improve awareness of and the processes for requesting access to potential places of refuge in the Arctic for ships in need of assistance, as recommended in AMSA Recommendation IIIA. It supports PAME's objective of protecting the Arctic marine environment by lessening the risk of pollution in the event of a disabled vessel, as well as protecting Arctic mariners and indigenous and local communities. This project aligns well with the efforts of both the Arctic Council and the IMO.

## List of Tasks/Activities

- Develop and circulate a questionnaire to Arctic State maritime administrations requesting information on all officially designated potential places of refuge in the Arctic for ships in need of assistance located in waters subject to their national jurisdiction.
  - The questionnaire would ask for information about such officially designated potential places of refuge, including: (1) location (latitude and longitude); (2) Arctic State requirements for requesting use of the potential place of refuge; (3) applicable requirements if the Arctic State grants a request to use a potential place of refuge; (4) the competent government authority for each officially designated place of refuge, including contact information; and other pertinent information, including any role accorded to indigenous and local communities in the Arctic State's decision to designate potential places of refuge and to allow their use in a particular instance.
- Prepare a draft table or spreadsheet of the information received. Circulate the draft to Arctic States, Permanent Participants, Observers, and other Arctic Council Working Groups for review and comment.
- Make the final inventory available on PAME's website as an aid to mariners, regulators, marine insurers, and other Arctic maritime stakeholders, including via the Arctic Shipping Best Practice Information Forum and its web portal, and as a new mapped data layer in the Arctic Ship Traffic Data (ASTD) System.
- If appropriate, submit the inventory as an information paper to a relevant meeting of an IMO Committee or Sub-Committee.

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<sup>3</sup> The proposed project does not address persons in distress at sea. There is a separate international law regime regarding the duty to render assistance to persons in distress at sea. The regime is codified in various international conventions, including the UN Convention on the Law of the Sea, the 1974 Convention on the Safety of Life at Sea, and the 1979 International Convention on Maritime Search and Rescue.

## Timeline and Major Milestones

- The questionnaire would be developed and circulated to Arctic States within three months of project approval.
- The project lead would ask Arctic States to respond to the questionnaire within three months of receiving it.
- Within three months of the questionnaire response deadline, the project lead would prepare a draft inventory with the information. The project lead would then circulate that draft to Arctic States, Permanent Participants, Observers, and other Working Groups requesting review and comment within three months.
- A final draft inventory would be prepared and submitted to PAME HoDs for final approval in consultation with the Permanent Participants at least 30 days before a PAME meeting or using the SAO guidance for written Working Group decisions.

## Budget

- This is a desktop project. No funds are required. Only in-kind contributions (that is, work time) are necessary to develop the questionnaire and then develop and publicize the final inventory.

## Project Team/lead(s)

- USA
- IMO

## Permanent Participants engagement

- Have Permanent Participants been engaged in the development of the project proposal?
  - Yes (please describe how): Comment on a draft of the project proposal was sought from the designated ICC-Alaska and AIA representatives to PAME by email on 10 June 2024.
- Will the use of traditional and local knowledge (TLK) lead to better project outcomes?
  - Yes (please describe how): The incorporation of TLK could be an important aspect of this project as it may provide new or supplemental information that leads maritime authorities to revise and update their potential places of refuge inventories.

# Annex 5: Arctic Marine Tourism - Mapping Whale Watching in the Arctic

## Project summary

Shipboard visitors to the Arctic are routinely rewarded with sightings of whales. However, careful management and dedicated research are needed to ensure that the growing Arctic marine tourism industry does not inadvertently harm these unique northern populations (especially of narwhal, beluga and bowhead whales), many of which are still recovering from heavy exploitation from historic commercial whaling and having to cope with climate driven changes to their habitats. While Arctic nations are working to mitigate the impacts of increased Arctic ship traffic on these species, far less focus has been placed on developing responsible marine wildlife watching measures and there is not yet a clear understanding of the extent of whale watching within Arctic waters.

This project will attempt to quantify and map whale watching activity within the Arctic, identifying which stock and populations are being routinely observed. This effort will help to obtain a better understanding of the extent of whale watching in Arctic waters, with a view to potentially help inform the development of responsible marine wildlife watching measures. While vessel-based tourism has the potential to affect whales, responsible tourism can also make a substantial contribution to local Arctic economies and whale conservation, through citizen science data collection, and by raising awareness of marine conservation. It is therefore important that this industry develop in a sustainable and well-managed manner, guided by research and the best available data.

## Background

Marine vessels, ranging from large cruise ships to smaller pleasure boats, are increasingly recognised for their persistent and pervasive pressures (e.g., noise, chemical, invasive species) in marine environments (1, 2, 3). Spatio-temporal variability of vessels and their associated impacts (2) pose a significant challenge for conservation, management, and planning (4, 5, 6). Although most large vessels (>300GT) can be tracked using Automatic Identification Systems (AIS), no similar mandatory methods exist for tracking the movements of smaller vessels that are not required to broadcast AIS (2), and these vessels can account for as much as 83% of all traffic in some areas (7). This hinders the understanding of the cumulative risks of impact associated with vessel traffic (e.g., the noise non-AIS carrying vessels contribute to the soundscape) (7, 8, 9) and our ability to monitor the activities of specific maritime industries (e.g., whale watching) that operate both AIS and non-AIS broadcasting vessels. It should be noted that AIS is widely used to model noise exposure and evaluate strike risk, particularly in the Arctic where there are challenges in deploying monitoring equipment such as hydrophones. The challenge is that these models underpinned by AIS alone are underrepresenting true exposure, as many vessels are not continuously broadcasting AIS.

Evaluating the relative contributions of all types of vessels is particularly important in remote northern regions where marine environments are under increasing pressure from climate driven changes (10). In these waters, the development of effective management and mitigation measures to reduce the risk of vessel impacts is critical for ensuring the conservation of vulnerable Arctic marine species (9, 11, 12), and improving the resilience of coastal and indigenous communities (13). These communities rely on marine mammals for subsistence, and increased vessel traffic can negatively impact their hunting activities.

This project provides value and connectivity to PAME and other Arctic Council working group activities. For example:

- This effort will build on past PAME work that explored the impacts of vessel-based tourism, notably the Arctic Marine Tourism Project;
- The results of this study will allow PAME's work on underwater noise to specifically consider the contributions of whale watching vessels to marine soundscapes. This will be achieved through extracting and analysing the specific subset of data relating to whale watching vessels and specific vessels such as expedition ships, allowing for the subsequent evaluation of vessel noise contributions from these specific ships through subsequent noise modelling; while this proposal does not intend to model noise, the cleaned data outputs would allow this to be undertaken);
- The data collected will enhance the Arctic Council's work on the ecosystem Approach to Management, which ensures sustainable management of human activities in the Arctic;
- The work supports PAME's efforts to expand the use of its Arctic Ship Traffic Data (ASTD) System, and to support research utilizing its data;
- Its potential to use the Arctic Biodiversity Data Service (ABDS), hosted by the Conservation of Arctic Flora and Fauna (CAFF) working group;
- Information generated by this work can be used to support both PAME's and CAFF's work on Arctic Protected Areas and to inform future briefs on Arctic marine environments under change;
- This project is primarily focusing on analysing vessel traffic data; while marine mammal data will also be collected through this project, it will not be analysed at this time but rather would be used to inform future research.
- Subsequent work exploring area-based measures for mitigating the impacts of whale watching activities would be informed by CAFF's and PAME'S Other Effective Area-based Conservation Measures (OECM) Areas in the Arctic Marine Environment project; and
- Future work would also benefit from collaboration with the Emergency Prevention, Preparedness and Response (EPPR) working group's Indigenous Knowledge Mobilisation Session, as well as PAME's work on applying indigenous and local knowledge to conservation planning to help inform potential monitoring strategies and gain a better understanding of how sensitive Arctic species might be to commercial whale watching.

## Key Objective

The overall aim of this work is to compile the first information on whale watching tourism in the Arctic using PAME's ASTD System in conjunction with industry engagement and a review of online information, in order to better understand recent development of this sector and to identify gaps in the data. Longer-term, this work could help inform the development of responsible marine wildlife watching measures.

## Scope

This project will compile information on whale watching tourism for the Arctic using PAME's ASTD System, in conjunction with industry engagement and a review of online information, to better understand this sector and identify gaps in data through:

- I. Updating analyses previously carried out on Arctic marine tourism [including the British Antarctic Survey (BAS) and PAME's report on Arctic Marine Tourism (14)] and conducting analysis of trends in Arctic marine tourism based on information from the ASTD system, and potentially other complementary datasets, with respect to the number of cruise ships, their size, and whether they offer whale watching excursions as part of their itinerary;
  - II. Identifying Arctic ports and harbours where whale watching operations take place and compiling an inventory of operators and their fleets; and
  - III. Identifying data/information gaps and potential ways to address these, for example, which vessels are broadcasting AIS A, B, or not at all, and how often these vessels encounter whales.
3. (It should be noted that data identifying specific vessels or operators will not be published; we are simply interested in getting an initial understanding of where whale watching operations are occurring and what the barriers are for understanding this using current data capabilities. By analysing the AIS data for other non-Arctic regions, while many whale watching operators do carry AIS, they do not always identify themselves as a whale watching boat. Likewise, while smaller vessels are generally far less likely to carry AIS, this may not be the case in the Arctic due to navigational safety. Therefore, AIS might be more suitable to consider whale watching in this region than others, or for specific areas, e.g., the high Arctic. To begin to understand which vessels are and are not being captured by AIS (including zodiacs deployed from expedition ships that may be engaging in whale watching), we are looking to get a better understanding of whether these vessels are included within our current database and within the vessel categories we're currently considering, e.g., passenger vessels.

This project will use the Arctic Circle as an approximate baseline, focusing on waters North of 60 degrees North, with adjustments made to the geographical scope as needed.

## List of Tasks/Activities

PAME will provide the team with access to the ASTD system to undertake this study, which will be completed through the following tasks and activities:

**T1:** Clean/filter, organise, and structure ASTD on cruise and passenger vessels.

- **A1** Online kick-off project meeting: refine participants' roles, finalise data transfer, and approve conference panel proposals.

**T2:** Identify vessels/cruise operators that offer whale watching excursions and where these occur.

- **A2** The idea is to identify which ships and companies are operating using the AIS data and use this as a starting point for doing some online research followed by reaching out to companies to solicit information from the combination of online data and informal interviews or emails.

**T3:** Analysis and mapping data (including overlaying vessel and whale distribution layers potential to use layers from CAFF).

- **A3** Online progress review meeting: consideration of AIS analysis

**T4:** Undertake an online review and interviews with industry (during Greentech meeting and virtually) and with relevant parties, including the incorporation of traditional and local knowledge whenever available) to identify ports and harbours where whale watching operations are based.

- **A4** In-person and virtual engagement with industry as required

**T5:** Prepare (writing retreat) and draft (working group meetings) a report to PAME and subsequent final submission.

- **A5** Writing retreat to draft findings report for presentation to PAME, develop materials for online dissemination (e.g., infographics, blog posts, and maps), and first draft of research paper. These materials will be targeted to specific audiences, e.g., general audience of Arctic Council member states, policy makers and managers, academics, and the international public. The proposed paper will be a pan-Arctic spatio-temporal analysis of tourist vessels, identifying trends over space and time in traffic and considering how this might have changed before and after the pandemic. There is also a discussion underway with World Wildlife Fund (WWF) colleagues to potentially consider the spatial overlap with tourist vessels in blue corridors or other identified important marine mammal habitats, but this is dependent on results of the primary analysis work. The reports will provide maps and figures for tourist vessel traffic for specific Arctic regions and territories (including updates of BAS analysis), and will also contain information on passenger numbers, as well as details of the Arctic ports with whale watching operators. Traditional and local knowledge will be incorporated to inform the project whenever possible.

**T6:** Review and dissemination of analysis findings via delivery of panel discussions and special sessions at the Arctic Circle and Arctic Frontiers to consider environmental impacts of ecotourism in the Arctic (proposals submitted months 2-6).

- **A6** Attend and deliver panel discussions at the Arctic Circle Assembly, in Iceland, and Arctic Frontiers, in Norway.

**T7:** Delivery of the final report to PAME for review.

## **Timeline and Major Milestones**

**D1** (months 1-2): Project kick-off meeting – planning for conferences and meetings confirmed

**D2** (months 2-4): Create a database of vessel/cruise operators that offer whale watching excursions (incorporating existing data from other databases wherever possible)

**D3** (months 3-6): Progress review meeting for AIS analysis (M1)

**D4** (months 3-8): Compile inventory of ports/harbours where whale watching operators are based

**D5** (months 8-10): Progress review meeting for 'Whale Watching Inventory' (M2)

**D6** (months 8-12): Wrap-up meeting – final report of 'Mapping Whale Watching Activities in the Arctic' (M3)

**D7** (months 10-12): Delivery of final report to PAME for review

**D8** (months 8-12): Preparation of scientific manuscript

## Budget<sup>4</sup>

Activity	Partner	Funder	Cost
Arctic Frontiers	UK (Heriot-Watt and Aberdeen University)	NERC – UKRI (confirmed)	15,300 CAD
Writing Retreat	UK (Heriot-Watt and Aberdeen University)	NERC – UKRI (confirmed)	5,400 CAD
Staff Time	UK (Heriot-Watt University)	In-Kind	9,000 CAD
Staff Time	UK (Aberdeen University)	In-Kind	18,000 CAD
Staff Time	PAME	In-Kind	9,000 CAD
Staff Time	Government of Canada	In-Kind	50,000 CAD
<b>Total Value</b>			<b>\$106,700 CAD</b>

## Project Team

### Project Co-Lead – Arctic Council Member State: Canada \*

- Project Co-Lead: Drummond Fraser – Senior Policy Advisor, Transport Canada: drafting of project proposal, attend project meetings, and provide feedback on analysis and reports. [drummond.fraser@tc.gc.ca](mailto:drummond.fraser@tc.gc.ca)

\*Other interested parties and Arctic States are more than welcome to join this proposal.

### PAME Secretariat:

- Hjalti Hreinsson – Project Manager, PAME Secretariat: data provision, drafting of project proposal, attend project meetings, and provide feedback on analysis and reports. [hjalti@pame.is](mailto:hjalti@pame.is)

### Project Co-Lead – non-Arctic State: United Kingdom \*

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<sup>4</sup> Current financing has been obtained to secure the time of researchers to work on the spatial analysis for this project. Currently there are no concrete plans to collect marine mammal data under the proposed work that has been outlined. Additionally, there are no plans to host or include any engagement events as current funding levels are not sufficient to allow for this. However, should additional funds become available, then this could be considered. The current work is focussed on data collation and preliminary analysis to allow for further questions to be asked. For example, once an initial inventory of operators is established, it would be great to work with communities and operators in different territories to identify any missing vessels/operators, identify the extents of their operations, what guidelines they follow, and what species they encounter, etc.

- Project Co-Lead: Dr Lauren McWhinnie (Heriot-Watt University) – lead, coordinate, and report on project, liaise with PAME and Arctic Council members, organise meetings and panel discussion events, support data gathering and analysis, report and manuscript drafting, as well as the wider dissemination of findings. [l.mcwhinnie@hw.ac.uk](mailto:l.mcwhinnie@hw.ac.uk)
- Lead Researcher: Dr Kate Gormley (Aberdeen University) – lead data analysis, contribute to report and manuscript drafting, project dissemination and panel discussions. [Kate.gormley@abdn.ac.uk](mailto:Kate.gormley@abdn.ac.uk)
- ECR: Emily Hague (Heriot-Watt University) – support data gathering and analysis, report and manuscript drafting, and wider dissemination of findings. [elh2001@hw.ac.uk](mailto:elh2001@hw.ac.uk)

\*While this project is being led by researchers from Heriot-Watt University and Aberdeen University, the leads collaborate closely with colleagues from other marine mammal research institutions, such as St. Andrews University's Sea Mammal Research Unit, as well as the WWF. It is anticipated that this project's findings will help inform the WWF's blue corridors project, as well as their work on vessel noise. However, the main lead for this project remains Dr McWhinnie with Heriot-Watt University.

## Permanent Participants' engagement

- Have Permanent Participants been engaged in the development of the project proposal?
  - While Permanent Participants have not been engaged during the development of this proposal, their views will be encouraged as this project moves forward and input provided will be incorporated in the project.
- Will the use of traditional and local knowledge (TLK) lead to better project outcomes?
  - The incorporation of TLK will be an important aspect in this project as it will greatly enhance the details provided on whale watching activities and marine mammal behavior. Accordingly, PP support will be key to the success of this project.

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# Annex 6: Development of a planning tool for area-based conservation of Arctic species and ecosystems: A case study on ice-dependent species

Joint PAME/CAFF project

## Project summary

The main objective of the project is to develop a tool for identifying Arctic areas of conservation priority for sea ice-dependent species to support their consideration and prioritization in marine planning and management, taking into consideration climate change and human use. The planning tool will be developed through a cooperative staged approach consisting of three phases: 1) horizon scan and scoping (Phase 1); 2) data portal and atlas (Phase 2); and 3) spatial planning app (Phase 3). Ultimately, the proposed tool could be expanded further to cover a wider selection of conservation features, allowing for a more comprehensive pan-Arctic analysis to support the planning and development of a climate-resilient network of area-based conservation measures, such as Marine Protected Areas, Other Effective Area-Based Conservation Measures and Indigenous Protected and Conserved Areas.

A staged approach will allow for an adaptive workplan and the active involvement of Permanent Participants, who will be invited to inform the early stages of project planning. The project will be based on the best available knowledge that will be made accessible through an interactive interface. The project will seek to include Indigenous Knowledge and local knowledge at all phases.

The proposed eventual planning area includes all 18 Arctic Large Marine Ecosystems. Phase 1 will identify (combinations) of LMEs, and hence species, to be prioritized, potentially narrowing down the geographical scope of the case study. Phase 2 will identify conservation features relevant for sea ice-dependent species, while data layers for human use may include commercial fisheries, ship traffic, mineral extraction, oil- and gas activities, tourism and subsistence harvesting.

Phase 3, spatial analysis and prioritization of areas to be considered for area-based conservation, will be based on the tool developed for recent work under the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) for the planning of the Weddell Sea Marine Protected Area Phase 2 (see [here](#)). This tool has proven successful and has been appreciated by those participating in this work under CCAMLR, not least due to its flexibility, speed, stability and suitability for use as support for interactive exploration of various conservation scenarios and solutions, for example in participatory workshops. While the complexity of human use, climate change, governance, jurisdiction and management regimes are considerably higher in the Arctic than in the Antarctic, the basic tool is considered suitable also for exploring conservation scenarios considering such complexities.

## Background

Ecosystem-based Management (EBM) is place-based, and various steps in the management cycle, such as description of biological and physical properties, assessing the ecosystem, and managing human activities, require spatial information to be effective and adaptive. Spatial management measures are therefore an important part of the toolbox to implement EBM and are the components of a pan-Arctic network of conservation measures (PAME 2015).

The goal of area-based conservation planning is to ensure that all conservation features are adequately represented in protected and conserved areas. By also including the present and projected future spatial distribution of human activities in planning exercises, it is possible to explore spatial solutions that minimize conflict with human use and promote sustainable use of ecosystems. Aiming to identify areas of higher conservation priority whilst minimizing the socio-economical cost, marine area-based conservation planning can be based on:

- (I) a specified geographical planning area;
- (II) conservation objectives with associated conservation features and representative targets;
- (III) potential cost/consequences and benefits for existing and projected human use of the planning area;
- (IV) spatial prioritization to support decisions on conservation planning.

Seasonally or permanently ice-covered Arctic marine areas provide for a globally unique ecosystem with habitats and specialized food webs that rely fully or in part on the presence of sea ice. This ecosystem is circumpolar in extent and is home to wide ranging species endemic to the Arctic, providing valued and valuable ecosystem services to peoples of the Arctic and beyond. Species and ecosystems linked to sea ice are highly vulnerable to rapid ongoing climate change, and as recommended in CAFF's Life Linked to Ice report (2013), Arctic Biodiversity Assessment (2013), and the State of the Arctic Marine Biodiversity Report (2017), the conservation requirements of these will likely change and become an increasing concern and priority of management efforts and international cooperation. For these reasons, sea ice-dependent species have been selected as a priority case study for development of a marine Arctic conservation planning tool.

## Key Objectives

The main objective of the project is to develop a tool for identifying and prioritizing Arctic areas of high conservation priority for sea ice-dependent species, taking into account climate change and human use. Ultimately, the proposed tool could be expanded to cover a wider selection of conservation features allowing for a more comprehensive pan-Arctic analysis to support the planning and development of a climate-resilient network of area-based conservation measures, such as Marine Protected Areas (MPAs), Other Effective Area-Based Conservation Measures (OECMs) and Indigenous Protected and Conserved Areas (IPCAs), as well as informing other

adaptive conservation measures contributing to EBM and that are based on spatial information.

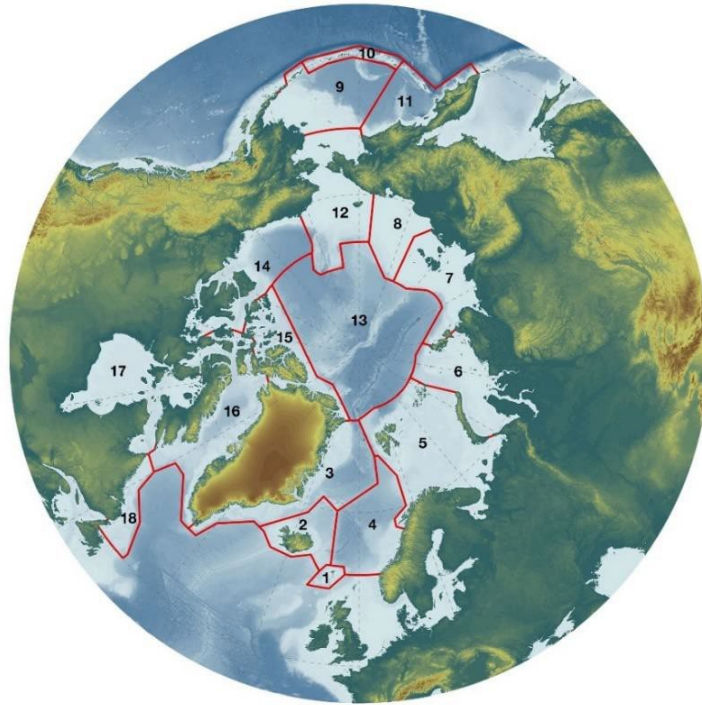
## Scope

The project will develop a conservation planning tool through a cooperative process consisting of three phases: 1) horizon scan and scoping (Phase 1); 2) data portal and atlas (Phase 2); and 3) spatial planning app (Phase 3). Such a staged approach allows for an adaptive workplan and active involvement of interested Permanent Participants (PPs) of the Arctic Council. It will be based on the best available knowledge and will be made accessible through an interactive interface to allow users to undertake planning exercises and produce scenarios according to their priorities. The project will seek to include Indigenous Knowledge and local knowledge at all project phases. The interactive data portal, data atlas, and the spatial planning app will aim to use existing datasets where available, to be scoped out during the initial Phase 1. A successful and meaningful outcome of this project depends on good cooperation among several Working Groups of the Arctic Council, to address both ecosystem states (e.g. CBMP, CAFF) and impacts (e.g. PAME, AMAP), and involvement of PPs and stakeholders. When in operation, the tool will be a contribution to the PAME MPA-Network Toolbox, that could be used for a variety of conservation planning purposes. Ultimately the planning tool could be further expanded to allow for more comprehensive pan-Arctic planning of climate-resilient area-based conservation measures.

## List of Tasks/Activities

### *Define Planning Area*

Large Marine Ecosystems (LMEs; see here) are outlined by physical and hydrographic boundaries but are characterized by distinct ecological features including productivity and trophic relationships, and as such provide geographical boundaries relevant for EBM on a large scale. This project includes all 18 LMEs (Figure 1) in the initial horizon scan and scoping phase, thereby allowing for an adaptive planning area covering up to 19.38 million km<sup>2</sup>. Phase 1 may prioritize (combinations of) LMEs based on various criteria and feasibility considerations including methodological feasibility and/or relevance towards the project objectives and scope.



**Figure 1.** Maximum extent of the adaptive planning area, including all Arctic Large Marine Ecosystems, as adopted by the Arctic Council in 2013.

### *Identify conservation features*

Conservation priorities and spatial planning should consider many different aspects such as habitats, species (across trophic levels), biodiversity aggregations, functional groups and communities, ecosystem functions and services, geological features, and areas or features valued by or providing value to people. The case study chosen for this project aims broadly at sea ice-dependent species. Phase 1 will therefore identify (combinations) of LMEs, and hence conservation features (such as populations of species, their habitats, and ecosystem functions manifested through their interactions), to be prioritized in this context. An example of such prioritization may suggest a focus on sea ice-dependent seabird and marine mammal species that are, in at least part of their life cycle, dependent on sea ice habitat and the marginal ice-zone (MIZ; Table 1). Phase 1 will also include a broader scoping of existing relevant data layers that may be used or adapted in this case study or in a later stage of development of the planning tool. For example, a scan of the already existing national and pan-Arctic data sets, including the ArcNet database developed under the lead of WWF, may be a part of such an exercise.

**Table 1.** Potential priority list of sea ice-associated Arctic seabird and mammal species. Adaptations will be made during Phase 1's horizon scan and scoping, identifying (combinations) of LMEs and species of higher methodological or conceptual feasibility.

<b>Species</b>	<b>Association with sea ice</b>
<b>Little auk (<i>Alle alle</i>)</b>	Foraging in the MIZ
<b>Least auklet (<i>Aethia pusilla</i>)</b>	Foraging in the MIZ
<b>Brünnich's guillemot (<i>Uria lomvia</i>)</b>	Foraging in the MIZ
<b>Glaucous gull (<i>Larus hyperboreus</i>)</b>	Foraging in the MIZ
<b>Ivory gull (<i>Pagophila eburnean</i>)</b>	Foraging in the MIZ
<b>Polar bear (<i>Ursus maritimus</i>)</b>	Most important hunting areas and access corridors to denning sites
<b>Bowhead whale (<i>Balaena mysticetus</i>)</b>	Entire lifecycle in the MIZ
<b>Narwhal (<i>Monodon monoceros</i>)</b>	Most of the life cycle in the MIZ
<b>White whale (<i>Delphinapterus leucas</i>)</b>	Sea ice-dependent life cycle (depending on the population)
<b>Ringed seal (<i>Pusa hispida</i>)</b>	Breed and moult on sea ice, and feed in association with sea ice
<b>Hooded seal (<i>Cystophora cristata</i>)</b>	Breed and moult on sea ice
<b>Harp seal (<i>Pagophilus groenlandicus</i>)</b>	Breed and moult on sea ice, and feed in association with sea ice
<b>Walrus (<i>Odobenus rosmarus</i>)</b>	Spend considerable amount of their lives on sea ice
<b>Ribbon seal (<i>Histiophoca fasciata</i>)</b>	Breed and moult on sea ice
<b>Largua seal (<i>Phoca largua</i>)</b>	Breed and moult on sea ice

#### *Develop climate change and human use scenarios*

According to the IPCC sixth Assessment Report (IPCC AR6), the Arctic Ocean will likely become practically sea ice-free during the seasonal minimum for the first time before 2050 in all global Greenhouse Gas Emission Scenarios (Shared Socio-economic Pathways, SSPs; anticipated climate change depending on a specific scenario of climate policies). Such projections will affect conservation features as well as human use, and it is therefore crucial to make the overall spatial identification and prioritization processes informed by ongoing and anticipated future climate change.

We will develop climate change impact scenarios using a range of environmental variables predicted by the most updated Coupled Model Intercomparison Project (currently CMIP6) and IPCC AR6 SSPs. Similarly, using existing time series, as well as forecasted development of human activities, future scenarios of change in human activities will be projected. This project is inclusive towards commercial fisheries, ship traffic, mineral extraction, oil- and gas activities, tourism and subsistence harvesting. These scenarios will expand the methodology developed under Weddell Sea MPA Phase 2 (WSMPA2), by adding in novel metrics to evaluate climate-resilience and by identifying climate forcing on human use.

#### *Spatial prioritization and interactive marine spatial planning tool*

An interactive tool for area-based conservation of Antarctic species and ecosystems has been developed as part of the WSMPA2 project. This spatial planning tool has proven successful in supporting stakeholder interactions and was furthermore commended for its ability to deliver best-available knowledge using open and reproducible science. This

shows the potential utility of such a tool which can be advantageously adapted to the Arctic and support relevant Arctic Council processes.

The use of this spatial prioritization tool is core to this project. Norway has extensive expertise and already an established network of global experts, including those that took part in the WSMPA2 project under CCAMLR and are committed to ensure a proper transfer of knowledge and adaptation of the tool.

Building on this tool, this project will use the same methodology and software as in the planning of the WSMPA2. This methodology uses “the minimum set objective function”, whereby spatial prioritization (using the R package “priorizr”) identifies areas of high conservation priority (e.g., areas with unique or multiple species) while also allowing for the exploration of solutions that take into consideration cost/consequences and benefits to people (e.g., avoiding areas valuable for human use).

#### *Potential future development(s)*

This project is adaptive at its core, ultimately aiming to develop an interactive spatial planning tool that can be used to support pan-Arctic climate-resilient area-based conservation of Arctic species and ecosystems, all based on the best-available knowledge, including Indigenous Knowledge and local knowledge. To promote its long-term impact, further development and adoption, this case study is rooted in Open and Reproducible Science principles geared towards both the FAIR Data Principles and the CARE Principles for Indigenous Data Governance. Any outcome of this project will lay the methodological and collaborative foundation for future inclusion of additional LMEs, conservation features (species, habitats, geological features, ecosystem services, functional groups), or human use that were not feasible within the scope of this case study. Expanded in this way, the spatial planning app will allow for exploration and discussion of potential spatial planning scenarios in a systematic conservation planning framework, using the same front-end interactive interface and back-end programming that was recently and successfully used in the WSMPA2 and will now be used in this case study.

## **Timeline and Major Milestones**

### ***Phase 1 (Year 1) – Horizon scan and scoping***

- *Scope how Permanent Participants will contribute to the project*

The inclusion of Indigenous Knowledge and local knowledge will be important at every phase of the project, including, but not restricted to, defining conservation objectives (Phase 3), selecting and developing conservation features, identifying cost/consequences of human use, and identifying user needs for the interactive data portal, atlas and spatial planning app.

- *Screen existing databases, data layers and sources, and identify data gaps for environmental, species distribution and human use*

This project aims at using existing data, currently hosted in databases or data portals by different countries and sources (within and outside Arctic Council Working Groups, such as CAFF, PAME and AMAP). Notably, recently a pan-Arctic database was created by ArcNet (see [here](#)), but is in need of further curation.

- *Adapt the scope of this project*

Given the ambitious aim to develop a pan-Arctic climate-resilient conservation planning tool, this project requires an adaptive staged approach. The outcomes of the above scoping exercises may identify (combinations) of LMEs, conservation features, human use of higher technical feasibility or conceptual priority, feeding into priorities of focus when executing Phase 2 and 3.

### **Phase 2 (Year 2) – Data portal and atlas**

- *Collate and harmonize environmental, species distribution and human use data*

Environmental, species distribution and human use data at the appropriate spatial and temporal scale is at the core of Phase 2, and compiling, harmonizing and quality-checking them according to Phase 1 priorities will be a comprehensive and challenging but necessary task.

- *Select and develop spatial layers of conservation features and human use*

The compiled environmental and species distribution data will feed into Habitat Suitability Models (HSMs) in order to model year-round environmental species niches and ultimately identify potential Areas of Ecological Significance (AESs). In the Atlantic Sector models already exist for a wide range of seabird (SEATRACK project; see [here](#)) and marine mammal species (see [here](#)).

- *Develop an interactive data portal and atlas*

All Phase 2 outcome on conservation features and cost/consequences, as well as underlying environmental, species distribution and human use data (observational and modelled), will be available in an interactive data portal and atlas (see WSMPA2 example [here](#)).

### **Phase 3 (Years 3-4) – Spatial planning app**

- *Define overall conservation objectives*

By combining criteria used to identify AESs with those used to identify and manage other types of important marine areas (Table 2) overall conservation objectives will be formulated, in consultation with Arctic Council Working Groups and PPs, guided by PAME's Framework for a pan-Arctic Marine Conservation Network, and prioritized for Phase 3 scenarios and spatial prioritization, again depending on Phase 1 priorities for (combinations of) LMEs, species and human use. These will be considered overall conservation goals, in order to provide direction for the selection of conservation features that need spatial data layers, the development of the interactive data portal and atlas, the construction of scenarios for future environmental change and human use, and the functionality of the spatial planning app.

**Table 2.** Examples of important marine areas classifications.

Type of marine area	Source
Marine Protected Area (MPA)	<a href="https://www.marinemammalhabitat.org/immas/imma-criteria/">https://www.marinemammalhabitat.org/immas/imma-criteria/</a> and <a href="https://portals.iucn.org/library/node/48887">https://portals.iucn.org/library/node/48887</a>
Other Effective Area-based Conservation Measure (OECM)	<a href="https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-08-en.pdf/">https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-08-en.pdf/</a>
Indigenous Protected and Conserved Area (IPCA)	<a href="https://conservation-reconciliation.ca/about-ipcacs">https://conservation-reconciliation.ca/about-ipcacs</a>
Particularly Sensitive Sea Area (PSSA)	<a href="https://www.imo.org/en/ourwork/environment/pages/pssas.aspx">https://www.imo.org/en/ourwork/environment/pages/pssas.aspx</a>
Area of heightened ecological significance	<a href="https://www.amap.no/documents/doc/identification-of-arctic-marine-areas-of-heightened-ecological-and-cultural-significance-arctic-marine-shipment-assessment-amsa-iic/869">https://www.amap.no/documents/doc/identification-of-arctic-marine-areas-of-heightened-ecological-and-cultural-significance-arctic-marine-shipment-assessment-amsa-iic/869</a>
Area of heightened cultural significance	<a href="https://www.amap.no/documents/doc/identification-of-arctic-marine-areas-of-heightened-ecological-and-cultural-significance-arctic-marine-shipment-assessment-amsa-iic/869">https://www.amap.no/documents/doc/identification-of-arctic-marine-areas-of-heightened-ecological-and-cultural-significance-arctic-marine-shipment-assessment-amsa-iic/869</a>
Ecologically or Biologically Significant marine Area (EBSA)	<a href="https://www.cbd.int/ebsa/">https://www.cbd.int/ebsa/</a>
Key Biodiversity Area (KBA)	<a href="https://portals.iucn.org/library/sites/library/files/documents/2016-048.pdf">https://portals.iucn.org/library/sites/library/files/documents/2016-048.pdf</a>
Important Marine Mammal Area (IMMA)	<a href="https://www.marinemammalhabitat.org/immas/imma-criteria/">https://www.marinemammalhabitat.org/immas/imma-criteria/</a>

- *Develop scenarios of future environmental change and human use*

Phase 1 priorities and Phase 2 outcomes will guide construction of policy and management-relevant scenarios of future environmental change and human use. Developments in environmental change and human use will be predicted and projected (up to 2100) in order to allow the spatial planning app to take into account anticipated change in climate and human use, as well as their potential interactions.

- *Develop a spatial planning app*

A spatial planning app with interactive web interface will be developed to allow exploration, discussion, and identification of potential spatial planning scenarios in a systematic conservation planning framework, using the same front-end visual interface and back-end programming as was recently and successfully used in the WSMPA2 (see [here](#)).

## **Budget**

This project requires substantial technical and scientific expertise. A dedicated full-time research technician will be needed for the duration of the project to gather and coordinate all the necessary data and their organization in an interactive data portal and atlas. This resource will also take part in the design and implementation of the spatial planning app. Additionally, a marine ecologist with a background in habitat or ecosystem modelling is needed to lead the entire process. Ideally, this ecologist with modelling expertise will then be in charge of the long-term operation and development of this project. Funding to ensure an adequate transfer of knowledge from the partners who developed the WSMPA2 interface is also needed and therefore included in the budget. The overall budget of basic operational costs assumes a start in May 2025 and completion in 2028, and would be 931,589 USD. This includes two positions at the Norwegian Polar Institute, Norway, knowledge transfer from partners and overheads. The annual operational costs are estimated to be in the range of 223,000-243,000 USD.

This preliminary budget does not cover costs related to workshops, expert meetings etc., that will likely be necessary, or the in-kind contributions of experts from other Arctic Council member states and Permanent Participants.

## **Project Team/lead(s)**

Lead: Norway/Norwegian Polar Institute; co-leads: Canada, Kingdom of Denmark, World Wide Fund for Nature. During Phase I of the project, both its content and partners will be further formulated, in addition to establishing an inclusive project group of experts.

## **Permanent Participants engagement**

This project proposal is based on approaches developed in the context of area-based conservation planning in Antarctica under the Convention for the Conservation of Antarctic Marine Living Resources. When applying these approaches to a pan-Arctic context, the involvement of Permanent Participants will be key to a meaningful and successful project. Permanent Participants are therefore invited to contribute and to participate in the project.

# Annex 7: Preventing loss of fishing gear parts and net cuttings from fisheries in the Arctic and Near-Arctic – Fishing Gear Management Plan (FGMP)

## Project summary

This project serves as an implementation activity under the theme “Reducing Marine Litter from Fisheries and Aquaculture” in the Regional Action Plan on Marine Litter in the Arctic ([ML-RAP](#)). Analyses of beach litter in the Arctic and Northeast Atlantic has shown that all nets from fisheries that were found on beaches, were parts of fishing gear rather than whole lost gear. Source analysis of these nets concluded that the parts mostly stemmed from operations on board the vessels (source: <https://doi.org/10.18174/541335>). This supports a theory that increased awareness and preventive planning of routines for handling of fishing gear is important to reduce the amounts of litter that end up on Arctic beaches. This project will build on the findings from the project under PAME’s Regional Action Plan on Marine Litter in the Arctic: “Fishing Practice & Gear Inventory: Enhancing Understanding of Abandoned Lost or otherwise Discarded Fishing Gear (ALDFG)”, and experiences from fishing industry in the Arctic. The project is an effort to compliment and contribute to the development of new requirements for fishing vessels and vessels engaged in fishing to be provided with a ship-specific “Plan for onboard management of fishing gear ship (Fishing Gear Management Plan-FGMP)” within IMO. These sources will be used to investigate which special conditions in the Arctic and near-Arctic that are relevant for routines and handling of fishing gear in light of a fishing gear management plan.

## Background

In March 2023 Norway submitted a document (MEPC 80/8) to IMO’s Marine Environment Protection Committee, with information on reasons for the loss of fishing gear, proposed additional active measure to reduce such losses, and a proposal to facilitate discussion on developing new guidance for management of fishing gear on board fishing vessels. The proposed “fishing gear management plan”, is comparable to the current requirement in MARPOL Annex V for all ships of 100 gross tonnage and above, and every ship which is certified to carry 15 or more persons, to carry a garbage management plan. The purpose of a “fishing gear management plan” is for every fishing vessel to develop a written procedure with clear routines to prevent fishing gear and parts of fishing gear from ending up in the sea during fishing and work operations on deck. IMO’s Sub-Committee on Pollution Prevention and Response (PPR 12) decided to include the proposal in the 2025 Action plan to address marine plastic litter from ships (“*Action No. 4, Consider the development of measures for a ship-specific management plan for the gear and equipment deployed in fishing activities, including the logging of fishing gear on board a fishing vessel*”). The revised action plan is pending adoption at MEPC 83.

Net cuttings and parts of fishing gear are a known source of marine litter on Arctic beaches, and a subject that is not largely tackled on international arenas to date. The Norwegian proposal to IMO's MEPC to establish requirements for a "fishing gear management plan" is an attempt to bring the subject on the agenda. Conducting a complimentary project under the Arctic Council is likely to have positive effects on other international work and will increase awareness on this problem.

In the PAME project "Fishing Practice & Gear Inventory: Enhancing Understanding of Abandoned, Lost or otherwise Discarded Fishing Gear (ALDFG)", fishing activities in the Arctic has been mapped in hopes that this can be used as a tool to reduce marine litter from fishing gear. This information will provide a valuable input to this project in an effort to identify the fishing activity in as much detail as possible, to tailor a "fishing gear management plan" to the specific Arctic fisheries.

Another possible synergy for the project is the ongoing work with OSPARs 2<sup>nd</sup> Marine Litter Regional Action Plan. One of the actions to reduce sea-based sources of marine litter in the OSPAR maritime area is "Promote practical solutions for reducing the impact of certain specific fishing related items, such as net cuttings and dolly rope".

## Key Objective(s)

- Increase awareness on a proved source of marine litter on Arctic beaches
- Reduce marine litter from fisheries in the Arctic and Near-Arctic through a tool for preventive planning
- Synergies with other international processes, and benefits for the IMO's efforts to develop measures to reduce littering from fishing vessels
- Create a platform for dialogue and cooperation between Arctic States and with fishing industry regarding the issue of lost fishing gear parts and net cuttings

## Scope

This project serves as an implementation activity under the theme "Reducing Marine Litter from Fisheries and Aquaculture" in the Regional Action Plan on Marine Litter in the Arctic ([ML-RAP](#)) and a follow-on to the ALDFG project. List of Tasks/Activities:

Co-leads from the Arctic States, with support from the PAME Secretariat, will engage a third party to carry out the project. This will entail analysis of existing knowledge, involvement of fishing industry, and writing of a report describing:

- Current status for fisheries and identified marine litter from fisheries in the Arctic and Near-Arctic
- Descriptions of why parts of fishing gear end up in the sea
- How a "fishing gear management plan" can be adapted to Arctic conditions to prevent marine litter

The Netherlands has proposed to organize a marine litter workshop in autumn 2025, which will be an integrated part of the project. The intent is to invite fisheries representatives, policymakers, researchers, NGOs and other experts to focus on providing an overview of current knowledge and identifying knowledge gaps related to waste management practices on board fishing vessels operating in the Arctic and Near-Arctic. Norway is proposed to co-lead for the workshop and the outcome of the workshop will contribute to the information gathering-phase of the project.

This project will also include a meeting or a workshop with representatives from Arctic States and fishing industry from the Arctic and Near-Arctic. This is important to increase the understanding of current practices and routines, and relevant challenges, and to facilitate dialogue on these issues.

## Timeline and Major Milestones

- May 2025 – Approval of the project as part of the PAME 2025-2027 Work Plan
- May-June 2025 – Co-leads and PAME Secretariat contracting third party consultants
- Autumn 2025 – Information gathering during “ALDFG and Fisheries Waste Management Workshop” proposed by the Netherlands
- Autumn 2025 - autumn 2026 – Active project phase
- Spring/Summer 2026 – Further information gathering through meeting(s) with representatives from fishing industry in the Arctic and Near-Arctic
- Autumn 2026 – Finished project delivery

## Budget

Budget for contracting third party/consultants: 50.000 USD

In-kind support from co-leads: oversee and provide steer for the work, including meetings with consultants, participation in meeting/workshop with fishing industry, reviewing and approval of final report.

## Project Team/lead(s)

Norway, Canada, Iceland and Kingdom of Denmark have agreed to co-lead the project. Because of the high variance and width in the fishing industry in the Arctic and Near-Arctic it is important to have input from several Arctic states. Contact-persons:

- Hilde Sofie Fantoft Berg, Norwegian Directorate of Fisheries, [HildeSofie.Berg@fiskeridir.no](mailto:HildeSofie.Berg@fiskeridir.no)
- Annsofie Kristiansen, Norwegian Environment Agency, [annsofie.kristiansen@miljodir.no](mailto:annsofie.kristiansen@miljodir.no)
- Bernard Leblanc, Fisheries and Oceans Canada: [Bernard.LeBlanc@dfompo.gc.ca](mailto:Bernard.LeBlanc@dfompo.gc.ca)

- Kingdom of Denmark: Heidi Mary Hansen, The Environmental Protection Agency: [heiha@mst.dk](mailto:heiha@mst.dk)
- Sóley Bjarnadóttir, Iceland's Environment and Energy Agency: [soley.bjarnadottir@uos.is](mailto:soley.bjarnadottir@uos.is)

## **Permanent Participants engagement**

The key knowledge will be related to deck operations onboard fishing vessels that may lead to plastic pollution, and inclusion of knowledge from fisheries operated by Indigenous Peoples will be sought.

# Annex 8: ALDFG and Fisheries Waste Management Workshop

## Project summary

The workshop will support work of PAME and the Arctic Council on the topic, and will be integrated into the activities of the project “Preventing loss of fishing gear parts and net cuttings from fisheries in the Arctic and Near-Arctic – Fishing Gear Management Plan (FGMP)” proposed by Norway. Fisheries representatives, policymakers, researchers, NGOs and other experts will be invited for the workshop. The focus will be on providing an overview of current knowledge and identifying knowledge gaps related to waste management practices on board fishing vessels operating in the Arctic, with a specific focus on waste produced on deck.

Format, location and timing of the workshop is to be determined (tentative late fall 2025).

## Background

Marine litter, particularly marine plastic litter, is amongst the most pervasive problems affecting the marine environment globally. This workshop is based on current and previous work of the Arctic Council on the topic of marine litter in the Arctic. The topics discussed are based on the strategic actions from the Regional Action Plan (2021) which supports Arctic States’ efforts to reduce marine litter, prevent negative impacts and mitigate risks, and improve cooperation and awareness. It furthermore is based on PAME’s work on Abandoned, Lost or otherwise Discarded Fishing Gear (ALDFG). Topics discussed at the workshop will provide input to PAME’s current and future work on ALDFG and feed into the Implementation of the Regional Action Plan. The workshop will also consider work of other Arctic Council Working Groups, such as AMAP. The workshop is also a part of PAME’s outreach activities related to marine litter in the Arctic.

## Key Objective(s)

To support the work of the Arctic Council and the Arctic States in their efforts to reduce ALDFG in the Arctic marine environment, prevent the potential negative impacts and mitigate the risks it may pose.

## Scope

The project relates to all of PAME’s work on marine litter in the Arctic, including the implementation of the Regional Action Plan, work on ALDFG and outreach activities.

## List of Tasks/Activities

- To establish a planning committee

- To plan the workshop
- Convening of the workshop
- Workshop report
- Outreach and communication

## Timeline and Major Milestones

- Early 2025: Project plan approved by PAME
- Spring, summer and fall 2025: Workshop planning
- Fall 2025: Workshop
- Winter 2025: Workshop summary

## Budget

TBD

## Project Team/lead(s)

- Kingdom of Denmark: Heidi Mary Hansen, The Environmental Protection Agency - [heiha@mst.dk](mailto:heiha@mst.dk)
- Norway: Hilde Sofie Berg and Annsofie Kristiansen, Norwegian Directorate of Fisheries ([hiber@fiskeridir.no](mailto:hiber@fiskeridir.no) & [annsofie.kristiansen@miljodir.no](mailto:annsofie.kristiansen@miljodir.no))
- The Netherlands: Wouter-Jan Strietman, Wageningen Social & Economic Research ( [-wouterjan.strietman@wur.nl](mailto:-wouterjan.strietman@wur.nl))
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In close collaboration with the Marine Litter Expert Group members.

## Permanent Participants engagement

Participation of the workshop is open to Arctic States, Permanent Participants, Observers and their respective experts.

# Annex 9: Arctic Mining Inventory: Overview of Regulatory, Operational, and Environmental Information for Coastal Mining

## Project summary

A centralized database is needed to summarize and consolidate information on mining operations across the Arctic that have potential impacts on coastal and marine environments. This resource would provide regulators, industry, and stakeholders with easy access to details about regulations and legal frameworks in different Arctic States, inventories of current and approved mining operations, and information on environmental management practices. Such a database would promote knowledge sharing among Arctic States and serve as a valuable tool to inform the sustainability and regulatory aspects of mining in the Arctic.

## Background

- This proposed work stems from the *Existing Waste Management Practices and Pollution Control for Marine and Coastal Mining* project, co-led by the Kingdom of Denmark and Canada. The project centered on a workshop to identify the main environmental challenges and issues in Arctic mining and discuss potential mitigation solutions. It was suggested that a web-based portal be developed as a continuation of this work, to ensure that results were accessible on a centralized platform. The portal would provide access to the knowledge shared during the workshop, as well as the results of a questionnaire distributed to participating Arctic States. This survey covered current and approved mining operations affecting the marine environment and collected a range of data, from basic details about each mine (e.g., name, location, and mineral exploited) to environmentally focused information (e.g., acid drainage, wastewater management, and biodiversity impacts).
- This Arctic Mining Inventory could be structured in a similar way to the *Arctic Offshore Oil and Gas Regulatory Resource*<sup>5</sup>, developed by PAME's Resource Exploration and Development Expert Group (REDEG). It could be used to inform other Arctic Council working groups about Arctic mining operations and their associated operational, environmental or regulatory contexts.

## Key Objective(s)

- Demonstrate the coordinated efforts of Arctic States related to Arctic mining operations with potential impacts to coastal and marine environments.

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<sup>5</sup> [Arctic Offshore Oil and Gas Regulatory Resource \(AOGRR\) | PAME](#)

- Facilitate the sharing of information on best practices from Arctic States and allow for better communication in the management, regulation, and enforcement of Arctic mining operations.
- Serve as a central hub for information sharing, and an outreach tool for Arctic Council Working Groups, Permanent Participants, observers and other stakeholders.

## Scope

The proposed scope consists of current and approved mining operations with potential impacts on the marine environment in the Arctic, including discharge of water, dust and other waste to the marine environment, or impacts on marine ecosystems related to infrastructure and transportation of mining materials (for example, links to shipping and underwater noise). This is the same scope as the *Existing Waste Management Practices and Pollution Control for Marine and Coastal Mining* project, which focused on land-based operations.

The scope may be modified based on discussions between project leads and PAME members, with the potential to include a broader range of operations including coastal placer mining and other operations that extend up to 12 nautical miles from the coast including internal waters. Similarly, in accordance with the data gathered in the initial survey, the database will focus on current and approved mines in the Arctic, with the possibility of incorporating information on abandoned mine sites at a later stage.

The project's survey included input from Canada, Finland, Greenland, Norway, and the United States, so any specific technical information will be based on these results. Although not all Arctic States participated in the initial survey, the project scope could be expanded to include additional countries that express interest.

## List of Tasks/Activities

- Collect all relevant data and materials from interested Arctic States, Permanent Participants and Observers to be included in the web portal. This includes compiling regulatory information (for example, relevant laws, mineral rights, environmental/impact assessment processes etc.), information from the workshop, survey responses, and any additional technical or environmental details (for example, biodiversity concerns, impacts of mining infrastructure on the marine environment, impacts of shipping related to the mining industry etc.). Ensure the data is well-organized and formatted for integration into the portal.
- Work with the PAME Secretariat and potentially a web designer to develop the portal. It is important that the platform is accessible, user-friendly and structured for easy navigation.
- Share a draft version of the web portal with Arctic States for review. Gather feedback on the content, functionality, and usability of the platform. Address any identified gaps, inaccuracies, or technical issues based on their input.

- Web portal will be reviewed on an ongoing basis to ensure that the database is maintained and contains up to date information. Arctic States will be asked to update information about their mining operations every 2 years (in the first year of the two-year Work Plan).

## Timeline and Major Milestones

- January 15, 2025: Draft proposal submitted to PAME for comments.
- February 21, 2025: Final proposal submitted to PAME for approval and inclusion in the PAME 2025-2027 Work Plan.
- Spring 2025: Project leads collect and organize information to be included in the web portal.
- Summer 2025: Information is reviewed by PAME.
- September-November 2025: Web portal is developed.
- December 2025: Web portal is circulated for final review and feedback.
- Winter 2026: Web portal is published on PAME website.
- Ongoing Activities: Arctic States to update their information every 2 years (in the first year of the two-year Work Plan).

## Budget

- This project relies on internal capacity of the project leads and PAME Secretariat. Depending on the structure of the web portal, a web designer may need to be contracted (TBD).

## Project Team/lead(s)

- Anders Mosbech (Kingdom of Denmark), Senior Researcher, Aarhus University: [amo@ecos.au.dk](mailto:amo@ecos.au.dk)
- Janne Fritt-Rasmussen (Kingdom of Denmark), Senior Researcher, Aarhus University: [jfr@ecos.au.dk](mailto:jfr@ecos.au.dk)
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- Filip Petrovic (Canada), Science Advisor, Crown-Indigenous Relations and Northern Affairs Canada: [filip.petrovic@rcaanc-cirnac.gc.ca](mailto:filip.petrovic@rcaanc-cirnac.gc.ca)
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- **Note:** WWF will contribute to the proposed web-portal by providing systematically organized information on conservation concerns and risks to biodiversity arising from current and planned mining operations (and the associated infrastructure).
- **Note:** Leads have been confirmed but are open to working with other Arctic States and interested Arctic Council Permanent Participants, Observers and partners.

## Permanent Participants engagement

- Have Permanent Participants been engaged in the development of the project proposal?
  - No: Since this project builds on a current REDEG project, the proposal was developed by the project leads. The information that will be included in the web portal includes technical information and regulatory information on mining operations. Permanent Participants will be invited to review the proposal, as well as the final web-based product.
- Will the use of Indigenous and local knowledge lead to better project outcomes?
  - Yes: The web portal will include an inventory of current and approved mining operations, as well as information on environmental regulations and management practices associated with the impacts of Arctic mining on coastal and marine environments. The website will also include links to guidelines and examples of best practices for the inclusion of Indigenous and local knowledge in mining. If there is interest from Permanent Participants, the project leads are open to including Indigenous and local knowledge in the resource, if relevant. Potential resources that could be considered include:
    - [Meaningful Engagement of Indigenous Peoples | PAME](#)
    - [EEE-Protocols-LR-WEB.pdf](#)
    - [Sámi Influence and Knowledge Exchange in EU Policy — Sámiráđđi](#)

# PAME

Protection of the Arctic Marine Environment

**PAME SECRETARIAT**

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