Project Proposal Title: Factsheet series on Arctic climate change impacts

(1st work package)
(revised version 20 Aug 2018)

Note: This version builds on the document version prepared for the Arctic Council Chair’s meeting at Levi in March, compiled by US and FI (based on all earlier version compiled by the PAME MPA EG group until then).

Project description

Main Tasks 2019-2021:

✓ Develop a template for Arctic Council thematic factsheets
✓ Develop a “master” Arctic Council fact sheet on Arctic climate change impacts
✓ Develop the 1st thematic factsheet on Arctic climate change impacts on MPAs and indigenous people’s lives.

Background

The rate of change in the Arctic is unprecedented in the climate record for at least the past few thousand years, with average Arctic temperatures increasing at about twice the global average. The warming has led to massive retreats in the extent and thickness of summer sea ice and the disintegration of ice shelves that have persisted for millennia. Simultaneously, acidification of the Arctic Ocean increases. On land, the warming increases the Active-Layer Thickness (ALT). The average active-layer thickness (ALT; determined by mechanical probing and typically accurate to 0.5 cm) in 2016 for 20 North Slope sites was 0.52 m, which is 4 cm greater than the 1996-2016 average. The coastal erosion also increases and the temperature is also threatening the existence of unique Arctic environments such as Palsa mires. These changes are devastating not only to Arctic biota, but also to the way of life of Arctic indigenous people as we know it.

The Arctic Council has a unique voice to leverage in communicating these facts. However, in order to, the Arctic Council need something to complement the high-quality reports produced by its working groups when addressing decision makers to take actions to mitigate the impact of climate change.

Project goals

✓ To leverage and synthesize factual information from the Arctic Council’s work in a layman’s format to communicate to decision makers and the public.
✓ Contribute to cross-working groups cooperation on common topics
✓ Contribute to the outreach aspect of the Arctic Council and ensuring close collaboration with the Arctic Council Secretariat.

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Building on previous work

At PAME’s 3rd workshop (co-organized by Finland and Sweden in September 2017) in a series on Arctic Marine Protected Area (MPA) networks, invited speakers presented the UK’s Marine Climate Change Impact Partnership (MCCIP) and the MCCIP Report Card (refer to Annex I). The MCCIP has published thematic Report Cards at regular intervals since 2006. The most recent card focussed on climate change and MPAs. Key to the Report Cards’ success in the UK is their summary of scientific information – both current conditions and projected trends -- in a concise and digestible format. The Report Cards do not make policy recommendations, leaving the reader free to draw his or her own conclusions based on the science. In UK, every Member of Parliament received printed versions of the cards. The public could also get the cards, either as printed versions or as online (pdf) versions. This process has also benefitted the scientific community by encouraging more collaboration and communication across disciplines. Our intention is to use the main components of success in our own project and, if possible, invite experts from the MCCIP into the advisory group. Extractions from the UK Report Cards are included in Appendix 1, as examples.

Finland presented the project idea for an Arctic Marine Climate Change Impact Fact Sheet at PAME-1-2018 in Quebec, Canada. The presentation piqued the interest of the CAFF and AMAP representatives at this meeting, and after discussing it in plenary, the group realized that such a fact sheet could be used more widely by other Working Groups, and, possibly by the Arctic Council as a whole (now, in June 2018, this latter option is possible). The PAME Record of Decision states as follows on this subject:

PAME appreciates Finland’s draft proposal for an Arctic Marine Climate Change Impact Fact Sheet and proposes the following next steps:

✓ PAME Secretariat to facilitate a discussion at the March Working Group Chairs’ meeting regarding idea to develop fact sheet(s) and how to collaborate and coordinate across Working Groups.
✓ Based on outcomes of the Working Group Chairs’ meeting, PAME Project Proposer(s) to draft proposal in cooperation with other relevant Working Groups with the goal of developing a joint Working Group proposal to be made available in advance of Fall 2018 Working Group meetings.
✓ PAME Secretariat, in cooperation with other Working Group Secretariats, to coordinate submission and presentation of a joint proposal to Fall 2018 SAO Meeting.
✓ PAME Project Proposer(s) to update PAME on progress at PAME II-2018.
✓ PAME Secretariat to coordinate with other relevant Working Group Secretariats on the identification of potential funding opportunities and development of draft funding proposals, as appropriate.

Project components and products

The project will take into consideration various successful templates such as the MCCIP’s template which is a concise, well informed, and easy to understand fact sheet that inspires the reader to reach his or her own conclusions of what actions need to be taken, without giving direct recommendations (Annex I). The project setup should ensure the active participation of all interested Arctic Council working groups toward a joint product.

Structure and Main Products

Structure

The factsheets will be developed according to the following outline:

1. A template/shared design that can be used for all of the fact sheets to include the following:
   i. a summary of the state of affairs today,
   ii. a bulleted list of key facts, and
iii. “what this means for you” – impacts for the daily lives of humans who are not intimately engaged with these issues in this part of the world.

2. A “basic” fact sheet that presents the general impact of climate change on the Arctic Ocean and the circumpolar land areas. How climate change impact on the lives of indigenous people can either be included in the “basic” fact sheet, or in the first thematic fact sheet as suggested below in point 3. It should be written in a way that makes it possible to use it in connection with all of the more specific fact sheets.

3. **Fact sheets on the impact of climate change on specific topics.** Per PAME I-2018, the first fact sheet idea is to focus on climate impacts to the marine environment, the impact of these changes on indigenous people, and the role of MPAs in building resilience to climate impacts. Translation of the fact sheet into the Arctic States’ main and minority languages would be a priority. These three topics could be presented in a single fact sheet with 8 pages, or less.

4. **Length:** a half-folded A3 (4 pages total).

5. **Digital/paper:** Primarily seen as digital resources but should be print-ready as well.

6. **Brand/layout:** The Arctic Council will be the primary brand with other working group’s logos following, as relevant to the topic.

7. **Audience:** The primary audience for all fact sheets would be policy makers at all levels and sectors within and outside the Arctic, but important additional audiences would be the public, educators and students. The fact sheets would not advocate specific policy positions or provide recommendations, but rather they would lay out major scientific findings to inform policy discussions. The fact sheets will help integrate and communicate recent products by Arctic Council working groups on climate change, and they will be based mainly on these reports, scientific publications and traditional and local knowledge, the latter in particular when describing the impact of climate change on indigenous people’s lives and cultures.

**Main Products**

It is proposed that this project be developed in a stepwise approach by starting on the following activities/work packages:

1. Develop a template/outline for the factsheets based on the proposed structure

2. Develop a “master” Arctic Council fact sheet on Arctic climate change impacts

3. Develop the 1st thematic factsheet on Arctic climate change impacts on MPAs and indigenous people’s lives based on the “master” fact sheet.

4. The design and the desktop editing and publishing of the final products

Following are examples of possible thematic factsheets that could be developed in collaboration and coordination with Arctic Council working groups. All thematic factsheets would be based on the “master” template e.g.:

- Heavy fuel oil in the Arctic
- Shipping in the Arctic
- Cooperating across Arctic borders
- Search and rescue in the Arctic
- Preventing oil pollution in the Arctic
- The changing Arctic climate
- Arctic coastlines under threat
- Marine life in the Arctic
- Arctic migratory birds
• Pollution in the Arctic (other than oil)
• Marine litter and plastic in the Arctic Ocean
• Indigenous languages in the Arctic
• Indigenous knowledge and science in the Arctic
• Connectivity in the Arctic
• Food culture in the Arctic
• Renewable energy in the Arctic
• Arctic Ocean acidification
• Black carbon in the Arctic
• Radiation in the Arctic
• Subsistence lifestyles in the Arctic

These products will be developed in close coordination and cooperation with other working groups and the Arctic Council Secretariat.

**Project timetable and milestones**

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 2018</td>
<td>Discuss project concept with PAME, as well as with CAFF and AMAP representatives, at the PAME-1-2018 (done)</td>
</tr>
<tr>
<td>Late Feb. 2018</td>
<td>PAME Secretariat to prepare to facilitate discussions by the AC Working Groups on how to incorporate this joint project into the work programmes of PAME, CAFF and AMAP, respectively, and how to collaborate and coordinate across Working Groups</td>
</tr>
<tr>
<td>March 2018</td>
<td>PAME proposes, and all interested Working Groups begin planning, the project at the Workgroup Chairs meeting in Levi, Finland</td>
</tr>
<tr>
<td>Fall 2018</td>
<td>Based on the outcomes of the Working Group Chair’s meeting, redraft the project proposal in cooperation with other relevant Working Groups, with the goal of developing a joint project proposal in advance of Fall 2018 Working Group meetings</td>
</tr>
<tr>
<td>Fall 2018</td>
<td>PAME Secretariat, in cooperation with other Working Group Secretariats, to coordinate submission and presentation of a joint proposal to Fall 2018 SAO Meeting</td>
</tr>
<tr>
<td>Fall 2018</td>
<td>PAME Project Proposer(s) to update PAME on progress at PAME II-2018.</td>
</tr>
<tr>
<td>Late 2018</td>
<td>The foreseen project leads and the Working Group’s Secretariats together identify potential funding opportunities and draft joint funding proposals, as appropriate.</td>
</tr>
<tr>
<td>2019</td>
<td>The project begins (depending on the funding)</td>
</tr>
</tbody>
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**Project Team Structure/Lead Countries**

**Project Team**

The leads for the initial work package are: Finland, USA, Canada (and Norway/TBC)

Other co-leads:

- ✓ PAME Secretariat and AMAP and CAFF secretariats (TBC)
✓ Each working group and Permanent Participants’ organization to appoint a project team member which could be from its secretariat.

The project team will serve as the advisory group and have an oversight over this work. Each subsequent work package/thematic factsheet could be led by a working group of which its topic is of direct relevance to its work. However, the thematic groups should have strong communication with the overall project team for coordination purposes and to ensure that the factsheets are consistent in content and structure.

Due to the cross-working group nature of this project, the project team should consider meeting in connection with the biannual meetings of the working groups chairs and executive secretaries. A consideration could also be given to include this project as a standing agenda item of the biannual meetings of the working groups chairs and executive secretaries.

Observers and External Partners

Observers and external partners are also invited to participate in the project advisory group and the sub-projects/sub-groups or be invited as experts in the meetings of these.

Indicative Budget and Funding

Consistent with the overall Arctic Council approach, the development of this project will be financed through voluntary contributions and in-kind support from member governments. The proposed stepwise approach will facilitate financial planning and budgets. Financial contributions will be sought from other sources as well, such as the Nordic Council of Ministers and the Moore Foundation.

<table>
<thead>
<tr>
<th>Item</th>
<th>Budget (USD/in-kind)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project management, coordination, consultation and outreach</td>
<td>50,000</td>
</tr>
<tr>
<td>Project consultant(s) for 2 years (e.g. ToR) ¹)</td>
<td>75,000</td>
</tr>
<tr>
<td>Meetings and travel costs</td>
<td>15,000</td>
</tr>
<tr>
<td>Editing, final layout and printing</td>
<td>30,000</td>
</tr>
<tr>
<td><strong>Estimated Total:</strong></td>
<td><strong>170,000</strong></td>
</tr>
<tr>
<td><em>(150,000 euros)</em></td>
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¹) Terms of Reference could e.g. be explored with GRID Arendal.
ANNEX I. Extracts form the UK Marine Climate Change Impact Partnerships Report Cards (extracts are from several cards (not only from one annual card)).
Confidence assessments

Contributing authors were asked to consider the level of confidence in the science for ‘what is already happening’ and ‘what could happen in the future’ for their specialist topics.

Authors were asked to mark an ‘X’ in the following grid to indicate the current level of confidence in the science, based on ‘level of agreement / consensus’ and the ‘amount of evidence available’ (see below for an example from the fisheries topic for ‘what is already happening’):

<table>
<thead>
<tr>
<th>What is already happening (fisheries)</th>
<th>Overall Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>High</td>
</tr>
<tr>
<td>M</td>
<td>Medium</td>
</tr>
<tr>
<td>L</td>
<td>Low</td>
</tr>
</tbody>
</table>

Each rating has an arrow to indicate whether there is an increase, decrease or no change in confidence.

Confidence may go up or down due to new data and model outputs becoming available or through changes in understanding of the science.

The majority of confidence ratings have stayed the same since 2007-2008. However, nine have gone up, whilst six have gone down.

2009 MCCIP Ecosystem Linkages Report Card

The 2009 MCCIP Ecosystem Linkages Report Card looked at five key issues (CO₂ and ocean acidification, Arctic sea-ice loss, seabirds and food webs, non-native species, and coastal economies) to show how the interconnected nature of the marine ecosystem magnifies the many discrete impacts of climate change, documented in the MCCIP Annual Report Cards.
Snapshots of marine climate change impacts

What is already happening

1. Improved environmental conditions (e.g., summer warming) for anchovy have led to an increase in their abundance.
2. A general northerly range shift is being observed in the Bering Sea, while both walruses and beluga whales are increasingly using the coast and further north in the region.
3. Short-beaked common dolphins are being reported in the Northern North Sea and the eastern part of the Scottish Continental shelf more regularly.
4. Warming of the sea surface by 0.1°C is increasing the population of Arctic cod species in the area.
5. The northerly movement of the northern gannet colony in the Arctic is increasing the last decade of the region of breeding colonies.
6. Numbers of harp seals and polar bears are increasing in response to increasing sea temperatures.
7. Population densities of blue whales (Balaenoptera musculus) and bowhead whales (Balaena mysticetus) have increased in response to increasing sea temperatures.
8. Declines in certain species, such as the North Atlantic right whale (Eubalaena glacialis), have been observed.
9. The number of polar bears is increasing, which is likely due to increased sea ice and more accessible breeding areas.
10. The range of some fish species, such as cod and haddock, is expanding.
11. The length of the growing season in some areas has shifted earlier, which may lead to earlier spawning in some species.

What could happen

1. A warmer climate will allow the expansion of temperate species, such as the Atlantic cod and haddock, into colder waters.
2. Some species, such as the Atlantic cod, may face increased competition and reduced availability of their preferred food sources.
3. Changes in ocean currents and sea ice patterns could lead to changes in the migration patterns of certain species, such as the Atlantic cod, which could affect their distribution and abundance.
4. The melting of sea ice, which is a driver of increased temperature and reduced ice formation, could have significant impacts on species that rely on sea ice, such as the polar bear and the walrus.
5. Changes in ocean temperatures and currents could lead to changes in the distribution and abundance of certain species, such as the Atlantic cod, which could affect their distribution and abundance.
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