



Arctic Council SAO plenary meeting
13-14 March 201, Ruka, Finland
Meeting code: SAOFI204

Document Title

Arctic Marine Biodiversity Monitoring Plan (CBMP-Marine Plan) 2019
Annual Work Plan and Status Report

Agenda item number

InfoDoc08

Submitted by

CAFF

Document filename

SAOFI204_2019_RUKA_InfoDoc08_CAFF-CBMP-Annual-Report

Number of pages, not including this cover sheet

22

Arctic Marine Biodiversity Monitoring Plan (CBMP-Marine Plan)

2019 Annual Work Plan and Status Report

6th February 2019

Table of Contents

1. INTRODUCTION	1
2. CBMP-MARINE ORGANIZATION.....	1
3. 2019 WORK PLAN.....	2
3.1. BUDGET	2
3.2. FUNDING AND PARTICIPATION	3
4. EXPERT NETWORK UPDATES	3
4.1. SEA ICE BIOTA EXPERT NETWORK	3
4.2. PLANKTON EXPERT NETWORK	4
4.3. BENTHOS EXPERT NETWORK	5
4.4. FISH EXPERT NETWORK.....	6
4.5. CIRCUMPOLAR SEABIRD EXPERT GROUP (CBIRD)	7
4.6. MARINE MAMMAL EXPERT GROUP	9
ANNEX – 2018 PRESENTATIONS AND PUBLICATIONS BY CBMP ENS RELEVANT TO CBMP GOALS.....	12

1. Introduction

The Arctic Marine Biodiversity Monitoring Plan (the CBMP-Marine Plan) is a pan-Arctic, long-term, integrated biodiversity monitoring plan produced by the Conservation of Arctic Flora and Fauna's (CAFF) Circumpolar Biodiversity Monitoring Program (CBMP). Approved by the Arctic Council in 2011, the CBMP-Marine Plan's objectives are to integrate existing circumpolar monitoring datasets and models to improve the detection and understanding of changes in Arctic marine biodiversity, as well as to initiate policy and management responses to these changes. The CBMP-Marine Plan represents agreement across Arctic marine nations on how to generate better results from existing collective monitoring efforts for Arctic marine ecosystems, designed to provide more comprehensive and timely circumpolar information for effective decision-making.

In 2017 the CBMP-Marine Steering Group (MSG) and Marine Expert Networks (ENs) completed the first State of the Arctic Marine Biodiversity Report (SAMBR). This report includes baselines, as well as the status and trends for several Focal Ecosystem Components (FECs) that were identified in the CBMP-Marine Plan. Furthermore, the SAMBR also contains advice for Arctic marine biodiversity monitoring. In 2018, the MSG and ENs started the first steps towards reviewing and adjusting CBMP's marine monitoring activities according to advice contained in SAMBR.

The work plan for 2019 (Table 1) includes a scoping workshop in the Fall of 2019 which will include a review of key elements of the monitoring program and identify potential areas of collaboration within the Arctic Council. The scoping workshop will be an important activity of the CBMP-Marine in 2019 and will help guide their work for the coming years.

2. CBMP-Marine Organization

CBMP-Marine consists of a Marine Steering Group (MSG) and six expert networks (EN). The primary functions of the Marine Steering Group (MSG) are to:

- Coordinate the implementation of the CBMP-Marine Plan;
- Ensure effective communication among and between the implementing states;
- Coordinate and provide direction to the Marine ENs;
- Facilitate input from national experts;
- Tracks implementation of the CBMP Marine Plan in response to advice from SAMBR; and
- Provide reports and information derived from monitoring activities to CAFF.

Chairs rotate on the MSG every two years. The MSG is currently led by Canada and Greenland. It is composed of one representative and an alternate from each Arctic marine state as well as representatives from interested Permanent Participants (PPs) and other members as appropriate:

- **United States:** John Bengtson, National Oceanic and Atmospheric Administration; Catherine Coon, Bureau of Ocean Energy Management (alternate)
- **Norway:** Eirik Drabløs Pettersen, Norwegian Environment Agency; Dag Vongraven, Norwegian Polar Institute (alternate)

- **Russia:** Vadim Mokievsky; P.P. Shirshov, Institute of Oceanology Russian Academy of Sciences.
- **Kingdom of Denmark:** Thomas Juul-Pedersen, Greenland Institute of Natural Resources; Fernando Ugarte, Greenland Institute of Natural Resources (alternate); Jan Sørensen, Kaldback Marine Biological Laboratory
- **Canada:** Bronwyn Keatley, Fisheries and Oceans Canada; Alain Dupuis, Fisheries and Oceans Canada (alternate)
- **Iceland:** Steinunn Hilma Ólafsdóttir, Icelandic Institute of Natural History; no alternate currently in place
- **AMAP:** Jason Stow, Fisheries and Oceans Canada
- **PAME:** Elizabeth McLanahan, National Oceanic and Atmospheric Administration
- **CBMP co-Chair:** Tom Christensen, Aarhus University, Kingdom of Denmark
- **CAFF Secretariat:** Kári Fannar Larusson, Courtney Price

Further information can be found here: www.caff.is/marine/marine-steering-group

The six ENs are based on FECs identified in the CBMP-Marine Plan: Sea Ice Biota, Plankton, Benthos, Fishes, Seabirds and Marine Mammals. The ENs are:

- Adopting and implementing the CBMP Marine Plan;
- Identifying priority knowledge gaps;
- Identifying existing datasets for aggregation;
- Meeting annually to review program implementation;
- Producing regular reports and publications; and
- Reviewing and adjusting the approach to monitoring approach.

Further information can be found here: www.caff.is/marine/marine-expert-networks

3. 2019 Work Plan

The table on the next page outlines the CBMP MSG work plan for 2019, which identifies tasks and associated details including linkages to the recommended actions of the CBMP Strategic Plan 2018-2021.

3.1. Budget

Estimated costs for continued implementation of the CBMP-Marine Plan are presented in the Plan and previous annual reports (for further details please see Appendix A. Implementation Schedule and Budget. In: *Arctic Marine Biodiversity Monitoring Plan*, CAFF Monitoring Series Report No.3, April 2011, ISBN 1. 978-9979-9778-7-2).

Based on this information, the 2019 budget for implementing the Marine Plan is estimated to be \$5000 USD per representative per meeting (travel and in kind), and an additional for hosting of the annual meeting. In 2019, a scoping workshop is being planned in conjunction with the CBMP-Marine annual meeting and this is estimated to increase the hosting cost due to the anticipated greater number of participants (venue size, etc.). The annual meeting and scoping workshop are planned to be held concurrently. The total estimated cost is 15.000 USD, not including travel support for invited experts.

In 2018, a CBMP coordinator was hired for the period of June 2018 to June 2020 to support the MSG and other CBMP activities including helping with the delivery of key elements of the CBMP Strategic Plan, such as the CBMP-Marine scoping workshop, revised workplan, and monitoring plan revisions.

3.2. Funding and participation

An ongoing challenge of the CBMP-MSG and ENs is securing consistent travel support for national representatives, both in the MSG and ENs. Inconsistent funding for EN work results in inconsistent deliverables. This varies across countries, ENs and projects. Additionally, there continues to be a need to support participation of Permanent Participants in the MSG and ENs.

Table 1. CBMP MSG work plan for 2019

#	Tasks	Project Components	Start-end date	Status	Details	CBMP strategic plan 2018-2021
1	CBMP-Marine organization	Encourage involvement by all participating countries/PPs	2011-	Ongoing	<ul style="list-style-type: none"> CAFF Secretariat to extend invitation to those countries/PPs that are not currently represented in the MSG and Marine ENs 	3.5; 4.1
2	Establish coordinated CBMP monitoring in each Arctic Marine Area	Arctic-based monitoring networks adopt parameters and sampling approaches		Ongoing	<ul style="list-style-type: none"> Funding is a limitation for making progress Progress made in some ENs (e.g., benthos) 	1.1; 2.4; 2.5
3	Further engagement of Observers and experts	Goal is to increase engagement and fill vacancies in Expert Networks	2017-	Planned/Ongoing	<ul style="list-style-type: none"> Update Terms of Reference for CBMP MSG (and ENs). ENs to consider further involvement from Observers and experts, MSG will work with CAFF Secretariat. 	2.3,2.4,2.5
4	Data management structures	Continued development of a system for data storage and sharing from CBMP Marine for inclusion within ABDS; entry of data from ENs, interoperability with relevant data frameworks, e.g., GBIF and OBIS web analysis tools; metadata added	2013-	Ongoing	<ul style="list-style-type: none"> MSG, CAFF Secretariat to encourage and support development of EN data management structures 	2.6
5	Reporting, communication, outreach	Annual work plan and status report; CAFF Board memo; national implementation reports (one-pagers); general communications; presentation of SAMBR at conferences	Ongoing	Ongoing	<ul style="list-style-type: none"> Annual work plan and status report: 2019 Memo to CAFF Board (scoping workshop memo including input from ENs from 2018 CBMP-Marine Annual meeting) Summary report of the 2019 CBMP-Marine Annual meeting and scoping workshop, location tbd SAMBR translation into Inuktitut (Canada) 	1.4; 2.2; 2.6
6	Fundraising	Continue to actively seek funding and other support/capacity for implementation	Ongoing	Ongoing	<ul style="list-style-type: none"> Application by CAFF to relevant sources MSG representatives seek travel support 	4.3

#	Tasks	Project Components	Start-end date	Status	Details	CBMP strategic plan 2018-2021
7	Annual face-to-face meeting of MSG and ENs	Fall 2019: Location tbd	Annually		<ul style="list-style-type: none"> CBMP-Marine annual meeting will be combined with the scoping workshop (see item #9). The preliminary plan is to have a 3-4 day meeting in the Fall 2019, i.e., 1 day for the annual meeting and 2-3 days for the scoping workshop. 	2.3; 3.1; 3.2; 3.5; 4.2
8	SAMBR next steps	SAMBR information is used and recommendations/gaps are addressed.	2017-	Planned/ Ongoing	<ul style="list-style-type: none"> CAFF Board representatives to discuss internally and at Board meetings with goal to provide direction to CBMP-Marine CBMP-Marine Scoping Workshop (item #9) considers SAMBR findings for review and planning next phase. 	2.1
9	Program review & adjustments: CBMP-Marine Scoping Workshop	Workshop to review the monitoring program including: 1) reviewing information users needs and questions, 2) identifying interactions with others groups (including PAME and AMAP), 3) refining/ adjusting the monitoring plan (e.g., drivers, parameters) and, 4) reviewing ways to inform users (e.g., reports, communication products, etc.)	Ongoing	Planned	<ul style="list-style-type: none"> Beginning late 2018: Planning committee to work on draft memo to CAFF board on scoping workshop, other tasks include refining objectives, developing agenda, identify preparatory tasks, identify participants/roles and plan logistics. Fall 2019: CBMP-Marine annual meeting + scoping workshop, location and date tbd. 	1.1; 4.1
10	Links to other groups	Establishing/strengthening collaboration with relevant organizations, e.g. Arctic Council Working Groups, ICES Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean, scientific experts on the Fish Stocks in the Central Arctic Ocean and contributing information to support the Convention on Biological Diversity (CBD).	Ongoing	Started	<ul style="list-style-type: none"> MSG members discussions with CAFF Board representatives and by the CAFF Board Related to item #9, i.e., planned discussions of linkages with other groups at the CBMP-Marine Scoping Workshop 2019. 	1.1

4. Expert Network Updates

This section provides updates on the top priorities, past year’s activities, and upcoming activities and needs for each of the six ENs.

4.1. Sea Ice Biota Expert Network

List of members

- Russia: Igor Melnikov
- US: Eric Collins
- Canada: Michel Poulin
- Norway: Bodil Bluhm (lead) and Cecilie von Quillfeldt (with input from Mikko Vihtakari, Haakon Hop)
- Iceland: N/A (no sea ice)
- Kingdom of Denmark: Thomas Juul-Pedersen

Top five needs, estimated cost and contributions (in-kind and otherwise)

Top need	Estimated cost	Contributions to date
Securing travel funds for meetings	~\$5000 USD per participant per meeting	Norway: requested from the Norwegian Environment Agency Kingdom of Denmark: sources are currently not identified Canada: sources are currently not identified US and Russia: sources are currently not identified

Top activities in the previous year (2018)

- Produced two draft manuscripts on sea ice amphipod pan-Arctic distribution
- Expanded data compilation on pan-Arctic ice algal biodiversity with temporal trend analysis and prepared draft manuscript (for special issue in *Frontiers in Marine Science*)
- Presented SAMBR sea ice biota chapter at various meetings (see Annex)
- Published several publications relevant to CBMP-Marine SIB EN, and partly directly resulting from SAMBR (see Annex)
- Brief field work at ice camp Barneo (had to be taken down due to poor ice conditions)
- Field work in Nansen Basin under The Nansen Legacy project

Main activities to be continued/completed in year ahead (2019)

Main activity	To be continued/completed in the year
Participate in scoping workshop to identify new activities and deliverables	2019
Finish two manuscripts on sea ice amphipod pan-Arctic distribution	Mid-2019

Finish manuscript on pan-Arctic ice algal biodiversity with temporal trend analysis	Mid-2019
Field work at MOSAIC ice camp, and in Svalbard fjord (Gradinger et al.)	Fall 2018-Fall2019; spring 2019

4.2. Plankton Expert Network

List of members

- Russia: Ksenia Kosobokova
- US: Russ Hopcroft (co-lead)
- Canada: Connie Lovejoy (co-lead), Michel Poulin
- Norway: Cecilie von Quillfeldt
- Iceland: Astthor Gislason
- Kingdom of Denmark (Greenland): Mie Winding
- Faroe Islands: Ian Salter

Top five needs, estimated cost, and contributions (in-kind and otherwise)

Top need	Estimated cost	Contributions to date
Securing support for a co-ordinator, data compilation, data management	\$20 000 to \$30 000 USD per year	None in 2018
Securing travel funds for meetings	~\$5000 USD per person per meeting	Suggest other countries follow Norway's lead and provide predictable travel funds. Funding especially critical for Canadian and Russian members

Top activities in the previous year (2018)

- Ongoing data aggregation on zooplankton, phytoplankton, and molecular data
- Publized SAMBR Plankton chapter
- Creation of bibliography of publications by CBMP members relevant to CBMP-Marine Plankton EN (PEN) (see Annex II)
- Presented at three international scientific conferences (Marine Biodiversity Congress, Montreal; Polar 2018, Davos; Arctic Biodiversity Congress, Rovaniemi)
- Continued development of partnerships with Alfred Wegener Institute (AWI, Germany), University Centre in Svalbard (UNIS, Svalbard) and, several laboratories of the Centre national de la recherche scientifique (CNRS, France).
- The Plankton EN added a member from the Faroe Islands.

Main activities to be continued/completed in year ahead (2019)

Main activity	To be continued/completed in the year
Compile new datasets on marine microbial eukaryotic biodiversity	Ongoing
Zooplankton mapping exercise	Ongoing

Continue search for funding and partnership development	Ongoing
Phytoplankton identification guide and new records; linked to involvement in the <i>TaxMArc</i> Norwegian project (<i>Diversity, taxonomy and distribution of marine protists in a changing Arctic</i>)	Ongoing
Incorporate data sets for Bacteria and Archaea	Ongoing

4.3. Benthos Expert Network

List of permanent members

- Russia: Nina Denisenko, Stanislav Denisenko
- US: Katrin Iken
- Canada: Virginie Roy (Lead), Philippe Archambault
- Norway: Lis Lindal Jørgensen
- Iceland: Guðmundur Guðmundsson
- Kingdom of Denmark: Martin Blicher (Greenland) and Jan Sørensen (Faroe Islands)

Observer countries

- Germany: Dieter Piepenburg and Jan M. Holstein
- Poland: Monika Kędra (co-lead)

Top five needs, estimated cost and the contributions (in-kind and otherwise)

Top need	Estimated cost	Contributions to date
Top Priority: Securing travel funds for meetings	~\$5000 USD per participant per meeting	<p>Travel funds needed for participants from: Canada, Greenland, Russia, US. Suggestion: Based on the low 2018 expert member attendance at Rovaniemi/Finland annual CBMP-Marine meeting, we propose that CAFF-CBMP Board should pay for one expert member from each of the 6 sub-groups every year (= funding for 6 participants at least).</p> <p>Norway: Institute of Marine Research, paid by the Norwegian Environment Agency</p> <p>Iceland: Guðmundur Guðmundsson, paid by the Icelandic Institute of Natural History.</p> <p>Observers: Germany: Piepenburg (paid by Alfred Wegener Institute Bremerhaven)</p>
Project Priority: Financial support for time spent to work on collecting macrobenthic (grab) national data and creating maps.	Cost tbd for Zoological Institute Russian Academy of Science (ZIRAS) scientist for compiling Russian grab-sample metadata.	Alfred Wegener Institute Bremerhaven is willing to provide 2-month stipend (in the framework of an AWI-ZIRAS MoU-based cooperation).

Top activities in the previous year (2018)

- Presented SAMBR results at several conferences and meetings in 2018 (Ecosystem Approach workshop in Seattle, US in January; Alaska Marine Science Symposium, in Anchorage, US in January; 4th World Conference on the Marine Biodiversity Montreal, Canada in May; Polar 2018, Davos, Switzerland in June and; Arctic Biodiversity Congress, Rovaniemi, Finland in October).
- Workshop in November 2018 on Long Term Monitoring Benthos from fish-assessment surveys: data work Reklavik, Iceland.
- Published 16 peer-reviewed publications in 2018 with regards to Arctic benthic biodiversity and trends (see Annex)

Main activities to be continued/completed in year ahead (2019)

Main activity	To be continued/completed in the year
Continue to develop trawl-monitoring	Continued under the project <i>Long-Term Benthos Monitoring network for detecting changes in the Arctic benthic ecosystem (LTM-Benthos) 2017-2020</i> . Funding from the Nordic Council, lead Lis Lindal Jørgensen. Jørgensen LL, Blicher M, Bluhm B, Christiansen JS, Fredriksen R, Hammeken N, Logerwell L, Ólafsdóttir SH, Roy V, Strelkova N, Sørensen J, Thangstad TH (2017) Detecting changes in the Arctic Ecosystem. RAPPORT FRA HAVFORSKNINGEN nr. 1-2018, ISSN 1893-4536 (online: https://www.hi.no/filarkiv/detecting_changes_in_the_arctic_ecosystem.pdf/nb-no)
Develop pan-Arctic maps on epifauna information (LTM-benthos)	See LTM project above. Initiated in Nov 2017 (Copenhagen) and to be continued to 2020. Meeting Nov. 12-16, 2018 (Reklavik, Iceland).
Gather available information on macrofauna collections on pan-Arctic scale (latitude, longitude, depth, date, sample status) to develop an overview of Arctic grab-surveys	Need to develop a sub-group to work on that project in 2019.
Develop overview of benthic species atlas (Barents Sea, Greenland Sea, US, Canada).	See LTM project above.
Continue consideration for future focus on ecological hotspots. Could be a cross cutting issue for CBMP marine. Focus could include mapping hotspots on a pan-Arctic scale. Identify driving forces behind these, identify stressors and map these, evaluate cumulative effects.	Continued. Nothing done in 2018.

4.4. Fish Expert Network

List of members

- Russia: Vadim Mokievsky (not active)

- US: n/a
- Canada: Kevin Hedges
- Norway: Edda Johannesen
- Iceland: Hreiðar Þór Valtýsson
- Kingdom of Denmark: n/a

Top five needs, estimated cost and the contributions (in-kind and otherwise)

Top need	Estimated cost	Contributions to date
Active participation by all Arctic countries on the CBMP-Marine Fish Expert Network (FEN)	Varies by country	Canada, Iceland and will likely continue to work together in the MFEN. Active, participation by US, the Kingdom of Denmark and Russia would greatly enhance our opportunities for data integration, analysis and monitoring.
Meeting travel	~\$5000 USD per participant per meeting	

Top activities in the previous year (2018)

- Published the Pan-Arctic marine fish atlas online February 2018:
<https://www.caff.is/marine/marine-monitoring-publications/marine-fishes-of-the-arctic>
- Presentation of SAMBR Fish chapter and Pan-Arctic marine fish atlas at the ABC in Rovaniemi and at the 4th World Conference on Marine Biodiversity Montreal, Canada in May; Polar 2018
- Printed and distributed 100 copies of the Pan-Arctic marine fish atlas
- Participated in the Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean (WGICA)
- Chaired 5th Meeting of Scientific Experts on Fish Stocks in the Central Arctic Ocean

Main activities to be continued/completed in year ahead (2019)

Main activity	To be continued/completed in the year
Participation in the Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean (WGICA)	Ongoing: 2017-2019
Participate in meetings of the group of Scientific Experts on Fish Stocks in the Central Arctic Ocean	Ongoing: 2016-2019

4.5. Circumpolar Seabird Expert Group (CBird)

List of members:

- Russia: Yuri Artukhin, Maria Gavrilov
- US: Kathy Kuletz, Robert Kaler
- Canada: Grant Gilchrist, April Hedd, Mark Mallory
- Norway: Hallvard Strøm, Tycho Anker-Nilssen
- Iceland: Erpur Hansen
- Kingdom of Denmark: Flemming Ravn Merkel, Bergur Olsen, Anders Mosbech

- Finland: Mia Rönkä (lead)
- Sweden: David Schönberg Alm

Observer countries:

- Netherlands: Maarten Loonen
- UK: Tim Dunn, Norman Ratcliffe
- France: David Grémillet
- Japan: Akinori Takahashi

Please note that CBird has their own workplan and that highlights of that workplan have been captured here. Related to the CBird workplan the group will at its next meeting in Akureyri, March 2019, further discuss top needs, estimated costs and contributions. However, prior to this meeting, the group has highlighted two top needs:

- On-line data portal for seabird population trend and breeding success data
- Travel funding for annual CBird meetings and CBMP meetings (~\$5000 USD per participant per meeting)

Top activities in the previous year (2018):

- Compiled an updated workplan
- Developed a format for country reports and started collecting the reports
- Finalized the SAMBR Seabird chapter, revised the CBMP Marine workplan and compiled the CBMP Marine annual report for CBird
- Contributed seabird monitoring data to SAMBR and Seabird Information Network
- Initiated CBird database cooperation with CAFF Secretariat
- Implemented species-specific conservation strategies and action plans
- Developed an on-line workspace for working documents
- Reviewed the Arctic Migratory Birds Initiative (AMBI) workplan
- Reviewed flyway base maps of auks for AEWA (fall 2018)
- Developed the Circumpolar Review of Arctic Tern Population Trends
- Developed the Murre harvest model study
- Developed the Black-legged Kittiwake conservation strategy
- Assessed seabird bycatch in Lumpfish fisheries
- Initiated an international Ivory Gull survey
- Initiated a shipping risk assessment in circumpolar regions
- Initiated a review and evaluation of seabird – polar bear interaction studies
- Initiated an assessment of the status and trends of Leach's and European Storm-Petrels
- Participated in the Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean (WGICA)
- Held an annual meeting, Cambridge, UK, March 2018
- Planned the annual meeting 2019 and started to plan the annual meeting 2020
- Participated in conferences and other meetings, in particular the Arctic Biodiversity Congress in Rovaniemi, Finland, and the World Conference on Marine Biodiversity, where in particular the SAMBR findings of CBird were presented

Main activities to be continued/completed in year ahead (2019) (up to 10 activities)

Main activity	To be continued/completed in the year
Annual meeting and participation in the CBMP Marine workshop	March 2019 and autumn 2019
International Ivory Gull survey	Ongoing
North Atlantic Murre Harvest model	Ongoing: 2017–2020
Shipping Risk to Seabirds in Circumpolar Regions	Ongoing: 2018-2021
Seabird – polar bear interaction studies review and evaluation	Ongoing
Circumpolar Black-legged Kittiwake Conservation Strategy and Action Plan	Ongoing
Participation in the Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean (WGICA)	Ongoing: 2017-2019
Circumpolar Review of Arctic Tern Population Trends	Ongoing
Bycatch in Lump sucker fisheries	Ongoing
Status and trends of Leach’s and European Storm-Petrels	Ongoing

4.6. Marine Mammal Expert Group

List of members

- Russia: Stanislav Belikov
- US: Rosa Meehan, Peter Thomas
- Canada: Steve Ferguson, Garry Stenson
- Norway: Dag Vongraven, Kit Kovacs
- Denmark/Greenland: Fernando Ugarte, Kristin Laidre
- North Atlantic Marine Mammal Commission: Genevieve Desportes

Top five needs, estimated cost and the contributions (in-kind and otherwise)

Top need	Estimated cost	Contributions to date
Update and maintain database – status and trends Converting summary data table into a custom database that can be dynamically updated and online in coordination with CAFF	Cost of updating: ~one week per country Cost of custom online database: tbd	Updating of database: in-kind from each country representative Majority of work done in gathering data; protocol needed to dynamically update database
Add focal parameters including health, telemetry, acoustic data and harvest samples. Work needed to add focal parameters:	Cost of initial scoping: ~2 weeks Cost of scoping	All parameters need further discussion to clarify parameters and design database; and to specify what topics or questions such data sources will help

<ul style="list-style-type: none"> Initial scoping – 2 weeks; further analysis and database development need group discussion Needs further scoping discussion – Canada planning initial meeting Needs further scoping discussion and identification of potential sources Identification of archived samples and potential availability for analysis – needs scoping; catch statistics available in some jurisdictions and by NAMMCO 	meeting organized by Canada: tbd	address
Evaluate habitat changes – potential focus on “hot spots” such as polynyas Potential evaluation as a system type analysis; Propose broader analysis based on initial Canadian workshop	Cost of at least 2-month salary: tbd Cost of collaboration meeting: tbd	Funds needed for 2-month salary and for collaboration meeting
Evaluate habitat changes – sea ice changes over time in Snow, Water, Ice, Permafrost in the Arctic (SWIPA) by AMAP (as per Stern and Laidre 2016 methods). Potential need for 4-month science salary to provide ice analysis	Cost of 4-month salary: tbd	Funds needed for 4-month salary
Re-establish ringed seal ecotypes analyses.		Data collation, clearing and preliminary analyses have been completed based on inputs from national programmes Funds needed for 2-month salary.

Top activities in the previous year (2018)

- Updated parameters in status table
- Added harvest occurrence to status table
- Participated in CBMP-Marine SG meeting (Ottawa)
- Finalized the Global Review of Monodontids (NAMMCO)

Main activities to be continued/completed in year ahead (2019)

Main activity	To be continued/completed in the year
Update status table	Ongoing
Evaluate health as a focal parameter	Initiating in 2018
Evaluate telemetry as an analysis tool	Ongoing
Evaluation discussions on acoustic data	Initiating in 2018
System type issue – “Hot spots”. Propose broader analysis based on initial Canadian workshop	Continued

System type issue – Ice dynamics. Propose broad analysis of measured biota response related to sea ice retreat over time	Continued
Evaluate compilation of Beluga morphometric data. No new research, gathering of comparable data throughout circumpolar range (similar to ongoing ringed seal evaluation)	Continued
Presentation of SAMBR results at World Conference on Marine Biodiversity	May 2018
SAMBR outreach workshop	January Alaska Marine Science Symposium
Ringed seal ecotype analyses/paper	Ongoing – to be completed in 2018
SAMBR implementation project (Rosa Meehan)	Ongoing
Meetings regarding mm planned for CAFF meeting in Finland (e.g. EN, Atlantic Arctic bowhead meeting)	October 2018
SAMBR – marine mammals results – presented at CAFF Biodiversity Congress in Rovaniemi	October 2018
Beluga meeting (in partnership with the Mystic Aquarium) – Arctic Countries presenting status etc.	Planning phase in 2018 – meeting in March 2019

ANNEX – 2018 Presentations and Publications by CBMP ENs Relevant to CBMP Goals

Selection of presentations and publications related to activities of CBMP-Marine by the members of the CBMP-Marine Expert Networks in 2018.

Marine Mammal Expert Network

- No 2018 publications directly related to CAFF

Sea Ice Biota Expert Network

Presentations

- SAMBR presentation in Oslo
- Bluhm BA, H Hop, IA Melnikov, M Poulin, M Vihtakari, RE Collins, R Gradinger, T Juul-Pedersen and C von Quillfeldt. 2018. State of the Arctic Marine Biodiversity: Sea ice biota. 12th Annual Arctic Frontiers Conference. Connecting to the Arctic, Tromsø, Norway. 21-26 January.
- Hop H, BA Bluhm, IA Melnikov, M Poulin, M Vihtakari, RE Collins, R Gradinger, T Juul-Pedersen and C von Quillfeldt. 2018. Sea ice biota: findings and recommendations from the State of the Arctic Marine Biodiversity Report. World Conference on Marine Biodiversity, Montreal, 13-16 May.
- Kunisch E, Drivdal M, Berge J, Bluhm BA, Daase M, Gradinger R, Hop H, Melnikov IA, Varpe Ø, Vihtakari M. Exploring life-cycle adaptations in a declining sea-ice environment: are sympagic amphipods truly sympagic? POLAR 2018 Davos, 19-23 June 2018 (talk)
- Poulin M. Project meeting *Diversity, taxonomy and distribution of marine protists in a changing Arctic* (TaxMArc) led by Drs B. Edvardsen and W. Eikrem, Drøbak, Norway
- von Quillfeldt C, Hop H, Vihtakari M, Bluhm B, Melnikov I, Poulin M et al. Sea ice – State of the Arctic Marine Biodiversity. 2nd Arctic Biodiversity Congress, Rovaniemi, Finland, 9-11 Oct 2018

Publications

- Bluhm BA, Hop H, Vihtakari M, Gradinger R, Iken K, Melnikov IA, Søreide J (2018) Sea ice meiofauna: meta-analysis of distribution and abundance documents large variability on local to pan-Arctic scales and across seasons. *Ecology and Evolution*, DOI: 10.1002/ece3.3797
- Hop H, Bluhm BA, Melnikov IA, Poulin M, Vihtakari M, Collins RE, Gradinger R, Juul-Pedersen T, von Quillfeldt C. 2018. Sea ice biota: excerpts from the State of the Arctic Marine Biodiversity Report by the sea ice biota expert network/CBMP. *Peer J*, 6: e26822v1.
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