



# **PAME-II 2007**

**SEPTEMBER 26<sup>TH</sup> - 27<sup>TH</sup>  
REYKJAVÍK, ICELAND**

## **WORKING GROUP MEETING REPORT**

**PAME**  
Protection of the Arctic Marine Environment



**PROGRAM FOR THE  
PROTECTION OF THE ARCTIC MARINE ENVIRONMENT**

**PAME**

**Working Group Meeting Report  
No: II-2007**

**SEPTEMBER 26-27, 2007  
Reykjavik, Iceland**

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**PAME Ecosystem Progress Report (29 August 2007 version)**

### **Agenda Item 1: Opening of the Meeting**

The Protection of the Arctic Marine Environment (PAME) Working Group met 26-27 September in Reykjavik, Iceland. The list of participants attending the Meeting is in Appendix I.

The meeting was opened by Mr. Ragnar Baldursson with the Ministry for Foreign Affairs and former Arctic Council SAO for Iceland. Chris Cuddy chaired the Meeting and expressed gratitude to Iceland for arranging and hosting this Meeting.

### **Agenda Item 2: Introduction and Adoption of the Agenda**

A list of documents submitted for consideration at the Meeting is in Appendix II. All power-point presentations will be sent out separately and are available within the password protected area of the PAME homepage.

*The Meeting adopted the agenda as presented in Appendix III.*

### **Agenda Item 3: Information from the Chair and Secretariat**

The PAME Chair reminded the Meeting of the main priorities and deliverables as identified in the PAME Work Plan 2006-2008 and emphasised the main goal of this Meeting to review mid term progress on all projects. He further reminded participants of the need to start thinking about inclusion of activities in the 2009-2011 PAME Work Plan.

The PAME Chair informed the Meeting of the Working Group Chair Meeting that was convened in Tromsø, Norway, 13-14 September 2007. The main purpose of this meeting was to introduce the role and responsibility of the newly established Arctic Council Secretariat in Tromsø, provide an update on the Norwegian Chairmanship priority issues, discuss main agenda items of the upcoming SAO meeting 28-29 November in Narvik and review updates on projects by working groups.

Three persons are working with the Arctic Council Secretariat and have been assigned as contact persons with the role to follow-up and communicate with the Arctic Council working groups i.e. Jesper Hansen for PAME and EPPR, Maria Gunnarsdottir for AMAP and ACAP and Tana Stratton for CAFF and SDWG.

As a follow up to the last SAO meeting, inputs were required from working groups on “Effectiveness and efficiency of the Arctic Council” and “Use of Working Group Logos and Endorsements”. This is for the purpose of advancing the Norwegian Chairmanship priority theme on “The Structure of the Arctic Council”. The PAME Secretariat submitted a one-pager on this in addition to PAME’s Operating Guidelines (Appendix IV).

Effectiveness and efficiency of the Arctic Council will be on of the agenda item for the next SAO meeting. The schedule of SAO meetings are: 22-24 April 2008 in Lofoten, 7-9 October 2008 in Svalbard. The next Ministerial meeting is planned to be held in March 2009

## **Record of Decisions and Follow-up Actions**

*The Meeting agreed to the following actions:*

*Coordination with other Working Groups: PAME Chair to inform PAME representatives about any correspondence concerning collaboration with other working groups.*

### **Agenda Item 4: Arctic Marine Shipping Assessment (AMSA)**

Mr. Ross McDonald/Canada gave an update on the AMSA process and AMSA data collection effort (presentation as a separate file and on the PAME homepage). He informed the Meeting that record minimum ice cover in the Arctic was on 11. September 2007 and noted a clear passage on the Canadian route first time ever this summer.

He talked about the issues of so call “Wild Cards” such as multiple ocean uses, Arctic ship emissions of nitrogen oxides and carbon monoxide, and today’s and hypothetical future EEZ maritime Arctic (after UNCLOS Article 76).

### **AMSA Chapters**

He provided a status on work on the AMSA chapter outline:

- 1. Introduction & Geography – work is underway*
- 2. History of Arctic Marine Transport & Governance*
- 3. Current (2004) Levels of Arctic Marine Use*
- 4. Indigenous Arctic Ocean Use/Town Hall meetings*
- 5. Scenarios and Futures of Arctic Marine Activity ~ 2020/2050*
- 6. Environmental Impacts ~ Current /Future Marine Activity*
- 7. Social/Economic Impacts ~ Current/Future Marine Activity*
- 8. Current Arctic Marine Infrastructure & Anticipated Needs*
- 9. Findings of the Assessment*

*Appendices, Research Agenda*

Work on Chapter 1 (Introduction & Geography) and Chapter 2 (History & Governance) is underway and several contractors funded by Transport Canada are drafting a number of key sections. For example Prof. Bill Barr, a noted Arctic historian, is writing on the Early History and a team of experts from Dalhousie University led by Prof. David VanderZwaag is writing the governance section.

Chapter 3 - Most of the 2004 Arctic shipping data has been received. The contractor is currently checking on accuracy and producing GIS maps. Each Arctic State will be asked in November to approve the final submission of their data.

**Chapter 4** - Indigenous Input/Town Hall meetings are ongoing and have already been held in Canada and Iceland; an AMSA survey on indigenous Arctic Ocean use has been sent by RAIPON to many communities in the Russian Arctic. Latest Town Hall meeting was held in Norway (27-29 September) and organized in cooperation with the Saami Council. The AMSA leads have planned to convene such meetings in Alaska (November/December 2007), Canada (Spring 2008), Greenland (tbd) and Russia (tbd).

**Chapter 5** – The scenario development process is proceeding well with two highly successful scenario workshops held in San Francisco (April 2007) and Helsinki (July 2007). An AMSA brochure on “Scenarios of the Future” has been published (distributed to participants at the Meeting) and can be downloaded from the PAME homepage or ordered from the PAME Secretariat. This brochure will be distributed widely in the Arctic Council and throughout the maritime industry. The scenario work to date illustrates that the two major drivers i.e. Governance and Resources & Trade have been developed to guide the ongoing drafting of the scenario narratives; the narratives will be plausible futures or stories for Arctic marine activity in 2050 and 2020. Major funding/support for the scenarios effort has come from: BP Shipping; Transport Canada; U.S. Arctic Research Commission; U.S. Department of State; and, U.S. National Oceanic & Atmospheric Administration. Drafting of the scenarios continues with drafts expected to be completed in October.



The Environmental and Socio/Economic Impact **Chapters 6 and 7** are causing a major challenge in advancing this assessment due to a lack of resources. Work on this is a bit further advanced for Chapter 6 then for Chapter 7. The AMSA leads are striving towards

establishing lead and contributing authors for those two chapters by November 2007. The leads reminded participants of previous announcements by countries towards contributions and noted that at the April 2007 SAO meeting in Tromso, Norway, Denmark and Finland offered to assist in the preparation of the AMSA Chapters and were willing to give this a further consideration as to availability to experts and associated resources. At the Meeting Norway informed that they had organised a group of experts that are willing to contribute in writing Chapter 6.

Work on Chapter 8 - Infrastructure will start with a Workshop for AMSA Chapter 8 Co-Lead and Contributing Authors 29-31 October in Ottawa, Canada.

Each Chapter will identify areas of research and findings and from there to recommendations. The leads will develop a process to turn findings into recommendations to present to PAME.

AMSA continues to be presented at a host of international venues and extensive networking has been conducted with elements of the global maritime industry; major maritime firms have contributed to the scenarios work

### **AMSA Timeline**

The AMSA timeline is such that all chapter drafts are to be completed in December 2008. In January 2009 editing will take place and AMSA Summary Report completed following the development of recommendations and presentation to the 6<sup>th</sup> Arctic Council Ministerial Meeting (tentatively scheduled for March 2009). The full AMSA report will be printed after the Ministerial Meeting.

### **AMSA Challenges**

The main challenges facing this assessment are:

- Urgent need to nominate lead/co-lead author(s) for Chapters 6 and 7 in addition to a group of contributing experts and Permanent Participants. Countries are urged to support this assessment, financially and/or in the form of providing experts.
- A vast majority of the AMSA effort and funding has come from Canada and the United States. Support from all Arctic States, especially support to contributing authors, will be required to make AMSA a true circumpolar effort.
- Additional funding must be secured to enhance the Permanent Participant outreach effort.
- Concern for the timeline and level of comprehensiveness of AMSA as data survey has taken much longer to execute in addition to needed resources (financial and human) from non-lead countries which has slowed progress of AMSA.

### **Discussions**

The Meeting discussed in general the AMSA process, content of chapters and general need for resources and below are some of the points mentioned and questioned raised during this discussion:

- The United States reiterated the importance of this assessment and expressed concern and surprise that it was not receiving deserved interest and resources (financial and human) from non-lead countries. The importance and urgency for this assessment, in particular in light of ACIA, increased interest and new information on climate change, merit a much more active involvement by non-lead countries.
- Norway asked why climate change was not one of the drivers in the scenario development and if climate change scenarios for 2050 are still appropriate in light of accelerated climatic changes and noted that some reports indicate 4-8 times greater changes than IPCC predictions. Norway further asked if the ASMA Roundtable had been used as a discussion forum for the assessment.
- Sweden suggested that maybe the assessment should not include such specific timelines as 2020 and 2050.
- AMSA leads replied by reiterating that climate change is not the main factor driving increased shipping in the Arctic, but reduced ice is a significant factor. The 2050 date for a long term scenario is still appropriate.
- The question on the significance of Townhall meetings was raised and the AMSA leads explained the need to engage Permanent Participants at the community level to affirm traditional and current usage of the sea, confirm current Permanent Participants concerns about shipping, and describe how these will be used in Chapter 4. In addition the United States added that these Townhall meetings should be viewed as a good faith effort in reaching out to these communities. The Chair noted the importance of these outreach activities.
- The question of need for clarification on the coverage of the Socio/Economic Impacts Chapter was raised and it was suggested that maybe the best way forward would be to use case studies.
- ICC-Greenland emphasised the linkages between Chapters 4 and 7. IPS noted that Permanent Participants have emphasised the need to address governance issues within Chapters 2, 4 and 7.
- EPPR noted the relationship with the AMAP Oil and Gas Assessment and Chapter 8.

### **Record of Decisions and Follow-up Actions**

*The Meeting agreed to the following actions:*

- *PAME chair to consult with lead countries representatives in developing a submission to the SAOs November 2007 meeting on any outstanding requirements for contributions (human and financial) to AMSA.*
- *PAME Chair and AMSA lead countries will report to the next SAO meeting on AMSA progress and issues.*

- *PAME chair to consult with lead countries representatives in developing a process for preparing draft recommendations based on key findings. This process needs to take into account PAME preparation process of recommendations and subsequent SAO review and approval process.*
- *Norway to confirm if they can provide a lead or co-lead author for Chapter 6 (Environmental Impacts) in addition to several contributing authors. Contributing authors from other countries should be identified.*
- *Lead countries to follow up with Denmark, Iceland and Sweden to determine if they could contribute a lead or co-lead author for Chapter 7 (Social and Economic Impacts).*
- *Lead countries will present draft chapters of the assessment that have been completed to the next PAME meeting.*
- *Lead countries to consider using roundtable as a forum to discuss issues of relevance to this assessment.*

#### **Agenda Item 5: Regional Programme of Action (RPA: Canada and Iceland)**

Canada and Iceland as the lead countries in advancing the implementation of the Regional Programme of Action for the Protection of the Arctic Marine Environment from Land-based Activities (RPA) convened a RPA Workshop on September 25<sup>th</sup>, 2007 in Reykjavik, Iceland. A RPA Workshop report will be published separately. This Workshop was hosted by the Icelandic Ministry for Environment.

The RPA Workshop was attended by experts from Arctic Council countries, Arctic Council Working Groups, Permanent Participants, Observers, Industry, NGOs and Academia.

The objective of the RPA Workshop was to seek broader Arctic Council input from Working Groups, Permanent Participants, and others on how their work contributes to the RPA, and how the RPA can be updated to make it more supportive of Arctic Council Work.

The results of the workshop will contribute to the preparation of the draft updated RPA document. Related information also to be considered include: assessments on priority substances causing marine pollution, habitat alteration issues, and climate change; and ways that other Arctic Council Working Groups and Permanent Participants might better engage in the RPA toward addressing these issues.

Below are proposed RPA milestones:

**Proposed RPA Milestones**

<b><u>ACTION</u></b>	<b><u>TIMELINE</u></b>
<b><u>2007</u></b>	
1) Draft Workshop Report ready for distribution to workshop participants	Late October
2) Comments from Workshop participants	Early November
3) Final workshop report ready for the SAO meeting. Notes to be provided to PAME Chair	Mid November
<b><u>2008</u></b>	
4) First Draft RPA to be distributed to RPA Contact Group & AC Working Groups, Permanent Participants and key workshop participants (including GPA Coordination Office and others)	Mid January
5) Comments from RPA Contact Group & AC Working Groups, Permanent Participants and key workshop participants (including GPA Coordination Office and others)	Early February
6) Possible conference call with RPA Contact Group & AC Working Groups, Permanent Participants and key workshop participants (including GPA Coordination Office and others)	Early February
7) Second draft distributed to RPA Contact Group & AC Working Groups, Permanent Participants and key workshop participants (including GPA Coordination Office and others)	Early March
8) Deadline for Comments from RPA Contact Group & AC Working Groups, Permanent Participants and key workshop participants (including GPA Coordination Office and others)	Late March
9) Distribute to PAME WG and SAO's (as an information item for SAO meeting)	Early April
10) Penultimate draft distributed to PAME and other Working Groups	Early May
11) PAME meeting – final approval / endorsement of penultimate draft	June
12) Address any final comments recommended from PAME	Late June
13) Forward final version to SAO's for Approval at Fall Meeting	Fall
14) PAME Secretariat to prepare / print new RPA document	Late Fall / Winter 2009
<b><u>2009</u></b>	
15) Forward new RPA to Arctic Ministers for Approval at Spring Meeting	Early Spring

## **Record of Decisions and Follow-up Actions**

*The Meeting agreed to the following actions:*

- *Lead countries will complete the workshop report and distribute it to all participants as well as other interested persons.*
- *Lead countries to take into consideration the RPA Workshop results when updating the RPA.*
- *Lead countries will contact the PAME/RPA points of contact group to assist in preparing a preliminary draft revised RPA.*
- *Lead countries to bring forward a preliminary draft RPA to the next PAME meeting.*
- *PAME to work closely with other working groups during the process of updating the RPA.*

### **Agenda Item 6: Evaluation and Update of the Arctic Offshore Oil and Gas Guidelines**

The United States as the lead country in Evaluation and Update of the Arctic Offshore Oil and Gas Guidelines referred to the response of Arctic Council countries to the inquiry regarding adequacy of the 2002 Arctic Offshore Oil and Gas Guidelines as per decision from PAME-I 2007 Meeting. Each of the respondents affirmed the need for such an update and provided areas warranting review, leading the United States to proceed with the second item of Objective 1, Action 3 of PAME's 2006-2008 workplan.

Objective I, Action 3 contains provisions for reviewing and updating the Guidelines as follows:

1. *Examine the adequacy of Arctic Council guidelines related to the prevention of marine environmental impacts of oil and gas activities in light of the Arctic Council's oil and gas assessment and in keeping with the review cycle approved by the Council.*
2. *Organize a workshop to assess the implementation of the Arctic Council Oil and Gas Guidelines, and whether there are gaps and a need to update in light of the findings and recommendations of the Arctic Council Marine Strategic Plan (AMSP) and Oil and Gas Assessment (OGA).*

The Arctic Offshore Oil and Gas Guidelines (Guidelines) were first published in 1997 and updated in 2002 recommend voluntary standards, technical and environmental best practices, management policy, and regulatory controls for Arctic offshore oil and gas operations. The Guidelines are periodically updated and revised—the last version can be viewed on the PAME website.

The United States informed the Meeting that a PAME Guidelines workshop would be convened December 7-8, 2007 in Miami, Florida, immediately following the 2007 International Regulators' Offshore Safety Conference (IROSC) - *Improving Offshore Safety Through International Cooperation* from December 3 - 6, 2007, at the Trump International Sonesta Beach Resort in Miami, Florida. This conference is hosted by the International Regulators' Forum (IRF), an informal group of oil and gas regulators from Australia, Brazil, Canada, the Netherlands, New Zealand, Norway, the United Kingdom, and the United States.

Regulatory officials and industry representatives from all nations with ongoing or proposed offshore oil and gas activity are invited to attend. The purpose is to share experiences and to compare differences in regulatory approach and safety performance. Information and registration is at: <http://www.mms.gov/international/IRF/IRF.htm>

This PAME Guidelines Workshop will be open to all stakeholders and will launch the updating effort of the Guidelines. To inform these discussions, experts are asked to: describe how the Guidelines have been used; discuss areas that need new or revised text; and identify the work needed to complete the task.

Furthermore, the December workshop will follow the planned publication of the Arctic Council's Arctic Monitoring and Assessment Working Group (AMAP) Overview Report of the *Assessment of Arctic Oil and Gas Activities—Effects and Potential Effects* and the public posting of the assessment on the AMAP web page. This will enable the process of updating the Guidelines to take full account of this assessment.

Participants are encouraged to attend at least part of the International Regulators' Offshore Safety Conference which deals with offshore oil and gas regulatory issues. It is also hoped that IROSC attendees will be able to join the PAME workshop. The opportunity to gain input and interest from this international body will prove very useful to the applicability of the Guidelines.

In preparation of the December workshop, attendees are requested to have reviewed the current version of the Guidelines and come prepared to discuss specific issues that are proposed for updating or improvement of the Guidelines. This may include

- Short interventions or presentations on how the guidelines have been used by countries, industry or by others;
- Short interventions or presentations on suggested updated information and new issues.
- Short papers with draft language or new text proposed for consideration and discussion.
- Nominations of experts by countries, PPs or observers to work on the rewriting of the Guidelines.

After this workshop, work will continue via an internet writing group and at side meetings during regular PAME meetings. The projected delivery date of a revised *Arctic Offshore Oil and Gas Guidelines* is mid to late 2008.

The lead for the United States is Tom Laughlin and the staff contact person is Dennis Thurston, Department of Interior/Minerals Management Services (MMS). His contact information is: [Dennis.Thurston@mms.gov](mailto:Dennis.Thurston@mms.gov) or +1-907-334-5338 (Alaska).

### **Record of Decisions and Follow-up Actions**

*The Meeting agreed to the following actions:*

- *PAME representatives to pass on information about the Miami meeting (7-8 December 2007) to their respective experts on oil and gas management.*
- *The Lead Country (USA) to provide information to PAME representatives on the main areas under consideration for updating the Offshore Oil and Gas Guidelines as proposed to date.*
- *ICC-Greenland will follow up with the Lead Country on possible funding for travel to the PAME expert meeting in Miami.*

### **Agenda Item 7: Ecosystem Approach – Large Marine Ecosystems (LME)**

Dr. Kenneth Sherman of the National Oceanic and Atmospheric Administration (NOAA) gave a general overview and update of the Large Marine Ecosystem Approach (LME) on behalf of the lead country (presentation as a separate file and on the PAME homepage).

He referred to the ecosystem progress report from 29 August 2007 (Appendix V) which includes update on the following: (1) Advance on the work of indicators, (2) Arctic LME map, (3) Contribute expertise, and (4) South north dialogue and networks.

He informed the Meeting of firm commitment to place the West Bering Sea LME project in the GEF pipeline for funding. A draft list of issues to be addressed by both the US and the Russian Federation has been prepared and is presently being reviewed. The UNDP is serving as the implementing agency for both the US and the Russian Federation in this effort. The approach includes the suites of ecosystem indicators and 5 modular strategic assessments. This project fits nicely into the fourth replenishment of the GEF trust Fund (2007-2010) and GEF has allocated funds for the West Bering Sea LME project. A draft of the West Bering Sea LME project proposal can be found at the password protected section on the PAME homepage or by contacting the PAME Secretariat.

The PAME/LME expert group has communicated by email correspondence since PAME-I 2007 meeting. The plan is that a meeting of the PAME/LME expert group will be convened within the next 6 months. Both Canada and the United States have expressed a willingness to host such a meeting but final decision is subject to available funds. The PAME/LME expert group will continue to consider both generic and specific indicators for three pilot areas i.e. West Bering Sea LME, Barents Sea LME and the Beaufort Sea LME.

He noted that contacts would be made with the lead countries of the shipping assessment to maintain close liaison as plans are formulated for prototype assessments of conditions in the West Bering Sea LME, the Beaufort Sea LME and the Barents Sea LME by respectively

US/Russia; US/Canada; and Norway/Russia. Special attention is to be paid to projections of ice reduction as it affects shipping and also LME bottom up food chain dynamics.

In closing he informed the Meeting of a south-north dialogue and networks i.e. a network of African GEF-LME projects which could possibly establish close linkages with interested parties in the Arctic Council countries on the results of ongoing LME projects around the entire African continent with other LME projects where ecosystem-based assessment and management activities are presently underway.

IPS informed the Meeting of socio/economic indicators being worked on by other groups of the Arctic Council such as SDWG.

The LME work is for the purpose of assessments and management so collaboration with other work within the Arctic Council is important. Thus the work on indicators by the PAME expert group on LMEs should be shared with other Arctic Council working groups that may be working on other indicators of relevance e.g. SDWG working on socio-economic indicators, AMAPs various assessments and CAFFs biodiversity assessment.

### **Arctic Marine Ecosystems - AMAP Oil and Gas Assessment**

Dr. Hein Rune Skjoldal from the Institute of Marine Research in Norway gave an overview of the Arctic marine ecosystems: ecological features (The AMAP Oil and Gas Assessment perspective) (presentation as a separate file and available on the PAME homepage).

He gave a brief update and status of the following AMAP Oil and Gas Assessment chapters:

- Chapter 1 Introduction
- Chapter 2 Oil and gas activities
- Chapter 3 Social and economic effects
- Chapter 4 Sources, inputs and concentrations
- Chapter 5 Effects on biota and human health
- Chapter 6 Status and vulnerability of ecosystems
- Chapter 7 Conclusions and recommendations

He informed the Meeting that LMEs are being applied in this assessment (Chapter 6 – Status and Vulnerability of Ecosystems) which has a direct relevance to the shipping assessment and the LME work. He further noted that this assessment uses the map of the 17 Arctic LMEs for descriptive purposes to assess impacts of oil and gas activities in the Arctic.

Questions were raised as to the version of the 17 Arctic LMEs map being used in the AMAP Oil and Gas Assessment. It was noted that this was not the Arctic Council endorsed final version of the working map of the 17 Arctic LMEs.

## **Record of Decisions and Follow-up Actions**

*The Meeting agreed to the following actions:*

- *The work on indicators by the PAME expert group on LMEs should be shared with other Arctic Council working groups that may be working on other indicators of relevance e.g. SDWG working on socio-economic indicators, AMAPs various assessments and CAFFs biodiversity assessment.*
- *The PAME expert group on LMEs to continue to contribute their expertise and products to the Arctic Marine Shipping Assessment and the updating of the RPA.*
- *The PAME Secretariat will distribute information on the LME work on LMEs in other areas of the world, e.g. the LME project in Africa.*
- *The PAME expert group on LMEs to meet within the next 6 months to review ongoing work on indicators and explore consensus on some generic indicators and consider with an eye to further develop specific indicators for the Arctic with emphasis on the three pilot areas. The Lead Country to invite the chairs of AMAP, CAFF and SDWG to send an expert to this meeting.*
- *PAME to promote the use of LME working map in work of the Arctic Council. The working map of the 17 Arctic LMEs as endorsed by Ministers in 2006 is the working map of the Arctic Council and as such should be used in Arctic Council related assessments.*
- *PAME takes note of the AMAP Oil and Gas Assessment methodology for consideration in developing recommendations for the AMSA.*

### **Agenda Item 8: Best Practices in Ecosystem-Based Ocean Management in the Arctic (BePOMAr)**

Norway is the lead country on the Implementation of the project on Best Practices in Ecosystem-Based Ocean Management in the Arctic (BePOMAr Project). This project is a joint PAME/SDWG effort and is based on one of the priorities of the Norwegian chairmanship from 2006 to spring 2009 i.e. integrated oceans management, and the mandate given on this issue at the 2006 Salekhard Ministerial meeting.

The BePOMAr Project has been revised as per requests made by SAOs at the April 2007 meeting. Lead authors for the participating countries have been identified. Additional authors for chapters on indigenous perspectives on ecosystem based management and large marine ecosystems have been identified.

The work schedule has been slightly modified following inputs from the authors. The deadline for first draft of chapters is now 1 November 2007. An authors meeting will be held in February 2008, after which the project will revert to its original schedule.

A website for the project is in the process of being established.

The United States informed the Meeting that they will not recruit a lead author for the country chapter writing but will submit a US paper which is currently going through an internal review.

The United States requested that the lead country provide a timeline for this project.

### **Record of Decisions and Follow-up Actions**

*The Meeting agreed to the following actions:*

- *Norway to provide PAME representatives with a timeline consisting of more details on next steps and to provide a draft report on the BePOMAr project for the next expert management meeting on this project and the next PAME meeting.*
- *Norway to follow up with the project coordinator to confirm that the Swedish contact person, as identified by Sweden, be included on the list of country contact persons for this project and that this person receive all relevant information on this project.*
- *Norway to provide information to PAME representatives and the PAME Secretariat whether an international workshop on this project is planned and if so its purpose and when and where.*

### **Agenda Item 9: Update of the GEF/Russian NPA-Arctic**

Dr. Ivan N. Senchenya, Project Manager of the UNEP/GEF project - Russian Federation: Support to the National Programme of Action for the Protection of the Arctic Marine Environment gave an update on its status (presentation as a separate file and available on the PAME homepage).

The overall GEF project work progress was discussed in the Steering Committee Meeting in St Petersburg, 25-26 April 2007 and IWP Phase I was revised. Decision was made by the Steering Committee to prolong Phase I of the Project until the end of 2008 to complete a minimum set of activities to ensure further project sustainability. It was also decided to carry out pre-investment studies during the Phase I.

He informed the Meeting of following priority next steps as follows:

- Finalization of round table discussions at regional and federal levels to the middle of November;
- Approval of SAP-Arctic by regional and federal authorities and publishing SAP-Arctic in Russian and English; International evaluation of the SAP-Arctic;
- Investment Forum on June 25-27<sup>th</sup> 2008 in Moscow to promote corporate social responsibility and public-private partnerships in the region. The main goal of the Forum is to promote and align corporate social responsibility (CSR) issues with investment opportunities in the Russian Arctic. The forum should foster a dialogue between the business community, government and intergovernmental organizations and other stakeholders.

- Completion of set of pre-investment studies by September 2008;
- Completion 3 main demonstration project by October 2008;
- Completion of a number of small size pilot projects by October 2008.

*The Meeting welcomed the update on the GEF/UNEP Russian NPA-Arctic Project and noted the importance of this Project for the protection of the Arctic marine environment.*

## **Agenda Item 10: Reports from Arctic Council Working Groups**

### **AMAP**

AMAP gave an overview of projects/assessments of some relevance to the PAME work, in particular the updating of the RPA which included the following:

- The 2007-2008 Mercury report.
- Updated assessment of POPs in the Arctic – scientific review articles on seven topics to, among others, support the Stockholm Convention.
- Updated assessment on radioactivity in the Arctic – reassessment of sources and evaluation of actions.
- Updated assessment on human health issues in the Arctic
- As a part of the follow up to ACIA work the AMAP Climate Expert Group is leading work on the Cryosphere project i.e. 1) Greenland ice cap, 2) Arctic Sea ice and 3) terrestrial (rivers, lakes and hydrology) – focus will be on impacts.

### **EPPR**

EPPR reminded the Meeting of the mandate of this working group (presentation as a separate file and on the PAME homepage) i.e. to deal with the prevention, preparedness and response to environmental emergencies in the Arctic. Members of the Working Group exchange information on best practices and conducts projects (e.g. development of guidance and risk assessment methodologies, response exercises, training etc.). EPPR is not a response agency. The work has focused mainly on oil and gas transportation and extraction, and on radiological and other hazards. In 2004, EPPR was directed by the Arctic Ministers to expand its mandate to include natural disasters.

EPPR Records of Decisions for 2007 of some relevance to PAME are as follows:

Request from AMSA: The secretariat will contact the AMSA lead (Dr. Lawson Brigham) about what kind of information is needed from EPPR to support the AMSA project. This request has been responded to by the AMSA leads.

Circumpolar maps: EPPR is planning to work with AMAP in further developing interface for Arctic generic maps.

Possible new project on Oil and Gas: Russian proposal on Development of Safety Systems in the Arctic while Implementing Infrastructural and Other Economic Projects. Other countries were invited to participate in the project.

The objective of EPPR is to focus on a set of issues regarding oil pollution, radiological and other hazards and Natural disaster in the Arctic region.

EPPR emphasised their interest in participating in the update of the Offshore Oil and Gas Guidelines.

Sweden asked for coordination on their proposed work on circumpolar maps with AMAP as all working groups of the Arctic Council are working on maps in various projects.

### **Record of Decisions and Follow-up Actions**

*The Meeting agreed to the following actions:*

- *PAME to review any papers prepared by AMAP as it relates to Arctic Ocean aspects of the cryosphere project.*
- *PAME to review EPPR project description for the development of generic circumpolar maps.*

### **Other Business and the next PAME Working Group meeting**

Sweden informed the Meeting of an upcoming IPY workshop on Sustaining Arctic Observing Networks (SAON). AMAP is in charge of this work within the Arctic Council. The Swedish and Canadian IPY Committees have agreed to take the lead in launch of this initiative by running a succession of workshops. The first workshop will be held in Stockholm, Sweden 12-14 November 2007. The second and third workshops, to be held in Alberta, Canada, in spring 2008 and in Finland Autumn 2008, respectively. Further information on this initiative and workshops are at: [www.arcticobserving.org](http://www.arcticobserving.org)

Canada informed the Meeting that they will host the next PAME meeting. Suggested timing is within the first two weeks of June 2008 and participants are urged to send in preferred dates to the PAME Secretariat.

The PAME Chair will convene a conference call with the Country Representatives prior to the SAO Spring 2008 meeting for preparation and status purposes.

## APPENDIX I – LIST OF PARTICIPANTS

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## **APPENDIX II – LIST OF DOCUMENTS**

### **Agenda Item 2 - Introduction and Adoption of the Agenda**

- Draft agenda with a timeline

### **Agenda Item 3 - Information from the Chair and the Secretariat**

- Agenda of the Meeting of Arctic Council WG Chairs and Secretariats Sep 13-14, 2007

### **Agenda Item 4 - Arctic Marine Shipping Assessment (AMSA - Canada, Finland, USA)**

- August 2007 Update on the Arctic Marine Shipping Assessment (AMSA)

### **Agenda Item 5 - Regional Programme of Action (RPA: Canada and Iceland)**

- Status Update of the Regional Programme of Action (RPA)

### **Agenda Item 6 - Evaluation and Update of the Arctic Offshore Oil and Gas Guidelines (USA)**

- Arctic Council Offshore Oil and Gas Guidelines-An Update. Information on an International Workshop December 7 and 8, 2007 in Miami Florida

### **Agenda Item 7 - Large Marine Ecosystems (USA)**

- Progress Report on the Ecosystem tasks: PAME Report -- United States -- August 29, 2007
  - Annex 2a - Large Marine Ecosystem Approach to Marine Resource Assessment and Management (Paper for Proceedings of 26-28 September 2006 Bergen Conference on implementing the ecosystem approach to fisheries (CIEAF).
  - Annex 2b - Draft GEF documents relating to LMEs

### **Agenda Item 8 - Best Practices in Ecosystems-Based Ocean Management in the Arctic (BePOMAr) project (Norway – PAME/SDWG)**

- Progress Report on Best Practices in Ecosystem-Based Ocean Management in the Arctic (BePOMAr)
- Project Document on Best Practices in Ecosystems-based Oceans Management in the Arctic (BePOMAr)

### **Agenda Item 9 – Update/Status of the UNEP/GEF Russian NPA-Arctic project (Russia)**

### **Agenda Item 9 – Summary of Report of UNEP/GEF Russian NPA-Arctic project (ACOPS)**

### **General Information**

- List of Participants
- Logistics (meeting location and hotels)
- PAME Meeting Report I-2007 (6-7 March 2007)
- Record of Decisions PAME I-2007

## APPENDIX III – AGENDA

### WEDNESDAY, September 26

#### 09:00-10:00

- Item 1:** Opening (Ragnar Baldursson, Ministry for Foreign Affairs, Iceland)
- Item 2:** Introduction and Adoption of the Agenda (PAME Chair)
- Item 3:** Information from the Chair and the Secretariat
- Main outcomes from the SAO meeting in April 2007
  - Outcomes from the meeting of Arctic Council WG Chairs and Secretariats Sep 13-14, 2007

#### 10:30-14:00

- Item 4:** Arctic Marine Shipping Assessment (Canada/Finland/USA)
- Progress Report
  - Tour de table and next steps

#### 15:30-17:00

- Item 5:** Regional Programme of Action (RPA: Canada and Iceland)
- Progress Report
  - Outcome of the RPA Workshop held on 25 September 2007
  - Tour de table and next steps

### THURSDAY, September 27

#### 09:00-10:00

- Item 6:** Evaluation and Update of the Arctic Offshore Oil and Gas Guidelines (USA)

#### 10:30-11:30

- Item 7:** Ecosystem Approach (USA)
- Progress Report on the Ecosystem tasks
  - Cooperation with other working groups
  - Tour de table and agreement on next steps

#### 11:30-12:00

- Item 8:** Best Practices in Ecosystems-Based Ocean Management in the Arctic (BePOMAr) project (Norway – PAME/SDWG)
- Progress Report and next steps

#### 13:00-16:00

- Item 9:** Update status of the GEF/Russian NPA-Arctic (Russia)
- Item 10:** Norwegian chairmanship and cooperation with Arctic Council WGs and activities: AMAP, ACAP, CAFF, EPPR and SDWG.
- Item 11:** Summary of Meeting Decisions and Follow up Actions (Chair & Secretariat)
- The PAME Progress Report to the SAO meeting in November 2007
- Item 12:** Any other business and closing of the Meeting

## **APPENDIX IV**

### **PAME input to the following two questions for the Meeting of Chairs and Secretaries, 13-14 September, Tromso, Norway**

#### **1. Effectiveness and efficiency of the Arctic Council:**

The activities of the Protection of the Arctic Marine Environment Working Group are governed by the Rules of Procedure of the Arctic Council. The PAME Working Group works within the framework of Operational Guidelines (attached) which should be read in conjunction with the Rules of Procedure.

PAME usually meets twice a year and the duration of each meeting is 2-3 days. The meeting locations are determined by the PAME members with the intent to have all countries host PAME meetings. The timing is usually scheduled approximately 2 months prior to SAO meetings. Invitations are sent to country representatives, Arctic Council working groups, PPs, Observers and copied to SAOs. Additional invitations are sent to experts in instances of specific project related activities. The attendance in general is such that all Arctic Council countries are represented, PPs present are generally from RAIPON, Saami Council, ICC and representation from the IPS. UNEP and WWF are the observers that occasionally attend PAME meetings.

Project specific meetings may occasionally be convened by respective leads in addition to the PAME bi-annual meetings. But PAME-related activities are most often coordinated by conference calls, emails and side-meetings at other venues. Informal meetings of only PAME country representatives ("Board Meetings") are sometimes convened at lunchtime during the PAME bi-annual meetings.

Project execution is usually through lead country commitments as identified in PAME work plans. PAME-related activities are only included in PAME work plans if lead country commitments have been secured. Some limited activities are undertaken by the Secretariat

Coordination with other working groups is a standing item on the agenda of PAME bi-annual meetings and is done in various ways such as by sharing of information/documents to chairs and secretariats, request for comments on specific activities, guidance on experts, emails etc.

Resources, both financial and labor, are through lead country approach and in-kind expert contributions. The PAME Secretariat works as a supporting function and is generally involved in PAME projects on an expert level.

The areas in need of improvement include better and more active involvement of working groups in each other activities of relevance i.e. attendance of each others experts in meetings and more active delegation of work and responsibilities. More involvement of PPs.

#### **2. Use of WG logos and endorsements:**

The PAME logo has been in use since 2000 and is only used on PAME approved documents and venues. Endorsement of projects follows the Arctic Council Rules of Procedures i.e. consensus decisions.

## **OPERATING GUIDELINES**

### **FOR THE PROTECTION OF THE ARCTIC MARINE ENVIRONMENT (PAME) WORKING GROUP**

The activities of the Protection of the Arctic Marine Environment Working Group are governed by the Rules of Procedure of the Arctic Council. The following guidelines should be read in conjunction with the Rules of Procedure.

#### **1. Representation**

- 1.1 Each Arctic State and Permanent Participant assigns one lead representative respectively and other representatives each Arctic State and Permanent Participant thinks appropriate.
- 1.2 The number and names of the representatives shall be given to the Secretariat at least 14 days prior to the meeting.

#### **2. Chair, Vice-Chair, and Secretariat**

- 2.1 In consultation with the SAOs, the Working Group shall select a Chair and Vice-Chair. The period for these positions will be 2 years.
- 2.2 The Chair shall act in a neutral capacity.
- 2.3 The duties of the Chair shall be to preside over PAME meetings and to direct and manage work programs approved by the Working Group, and to take initiatives and put forward proposals to the Working Group that could provide the efficient execution of its work.
- 2.4 The duties of the Vice-Chair are to substitute for the Chair when the Chair is not available and to also assist the Chair in his or her duties.
- 2.5 The duties of the Secretariat are to help co-ordinate the work program, facilitate information exchange, arrange meetings, support reporting on and implementation of the program, and undertake tasks assigned by the Working Group.

#### **3 Meetings**

- 3.1 The responsibility for organisation of these meetings shall be rotated among the Arctic States and co-ordinated by the Chair and Secretariat.
- 3.2 An invitation to the meeting with a draft agenda proposed by the Chair in consultation with the representative of the Host Country should be submitted by the Secretariat to those invited to the meetings at least 30 days in advance.

#### **4 Reports**

- 4.1 A draft final meeting report including the record of decisions shall be distributed to all Arctic States, Permanent representatives and other meeting participants by the Secretariat within 30 days of the conclusion of the meeting.
- 4.2 Comments on a draft final meeting report shall be submitted to the Chair and Secretariat within 30 days after issuance and the final meeting report shall be subject to the approval of participating Arctic States.

#### **5 Document Management**

- 5.1 All documents shall list the title, author, and date, after which the Secretariat shall provide a relevant agenda number.
- 5.2 Every effort shall be made to submit papers to the Secretariat for circulation at least 30 days prior to the meeting at which they are to be considered.

## **APPENDIX V**

### **PAME ECOSYSTEM PROGRESS REPORT – 29 August 2007**

#### **1. Advance on the work of indicators**

Through correspondence on March 13, 2007 (Annex 1), the US provided background information to each member of the LME experts group, and provided a copy of the Large Marine Ecosystem Approach to Marine Resource Assessment and Management (Paper for Proceedings of 26-28 September 2006 Bergen Conference on implementing the ecosystem approach to fisheries (CIEAF) (Annex 2). The response was limited to Canada, whose expert supported the approach suggested. Opportunities to discuss the indicator approach for LMEs was presented at the July meeting of the Consultative Committee meeting on LMEs in Paris, which was attended by 3 members of the PAME expert group (Kenneth Sherman, Gennady Matishov and Hein Rune Skjoldal). In further discussion, the approach was again supported. A 3<sup>rd</sup> opportunity was presented during the GEF meeting in Cape Town with International Waters experts participating in a panel discussion on LMEs with project managers of GEF-supported projects, including Paula Caballero, Yihang Jiang, Kenneth Sherman, Chidi Ibe, Mick O'Toole, and representatives of the Caribbean and Gulf of Mexico LME projects. The LME approach was supported, along with a review of high priority areas for GEF support during replenishment 4 (2007-2010), which will include approximately \$230 million in funds for GEF LME projects with a focus on the recovery of depleted fish stocks, the reduction of nutrient over-enrichment, the reduction and control of coastal pollution, and adaptation to climate change effected by ice melt in the Arctic regions.

There was a firm commitment for placing the West Bering Sea LME project in the GEF pipeline for funding. A draft list of issues to be addressed by both the US and the Russian federation has been prepared and is presently being reviewed. The UNDP is serving as the implementing agency for both the US and the Russian Federation in this effort. The approach includes the suites of ecosystem indicators and 5 modular strategic assessments.

A draft of the West Bering Sea LME project proposal is presented in Annex 3.

It is now appropriate to arrange a meeting of the expert group. Both Canada and the United States have expressed a willingness to host such a meeting within the next 6 months, contingent on available funds. We will keep the Secretariat advised on the venue.

#### **2. Arctic LME map**

The Arctic LME map is available to members of PAME on request.

#### **3. Contribute expertise**

The US side will be in contact with the co-chairs of the shipping assessment to maintain close liaison as plans are formulated for prototype assessments of conditions in the West Bering Sea LME, the Beaufort Sea LME and the Barents Sea LME by respectively US/Russia; US/Canada; and Norway/Russia. Special attention is to be paid to

projections of ice reduction as it affects shipping and also LME bottom up food chain dynamics.

#### **4. South north dialogue and networks**

A network of African GEF-LME projects was established during the Consultative Committee meeting on LMEs in Paris in July 2007. The Group was established as the African LME Alliance (ALMEA). Through this network it will be possible to establish close linkages with interested parties in the Arctic Council countries on the results of ongoing LME projects around the entire African continent including: the Mediterranean Sea LME, the Canary Current LME, the Guinea Current LME, the Benguela Current LME, the Agulhas and Somali Current LME, and the Red Sea LME. Other information will be made available from a more northern tier of LME projects including from the Baltic Sea LME, the US Northeast Continental Shelf LME, the Norwegian Sea LME, the Icelandic Shelf LME, the Yellow Sea LME, the Gulf of Alaska LME and the East Bering Sea LME, where ecosystem-based assessment and management activities are presently underway. Benefits, summaries of the effects of climate change, and lessons to be learned from ongoing activities can be communicated through network activities and through the portal development underway in the NOAA-Fisheries Narragansett Laboratory.

Sea Surface Temperatures in 61 of the 64 LMEs were in a warming trend over the past 50 years. In the past 25 years, in situ observations show that SST has accelerated for the years 1985 to 2006 at a level that is 4 to 8 times greater than previously reported in a global SST analysis by Japanese scientists. This finding will be important in the assessment of the 17 Arctic LMEs. One of the issues to be examined will be the effects from global warming of strengthening thermoclines on the exchange of nutrients between surface and bottom waters, and bottom up annual productivity cycles affecting Arctic food webs including fish, marine mammals and marine birds. The time series information on SST, chlorophyll, and primary productivity will be made available through the LME Narragansett Laboratory portal to the Arctic Council, specialists and working groups. These findings will be presented at the Reykjavik meeting by the US.

## **Annex 1**

### **E-mail Correspondence**

#### **1) 13 March 2007 e-mail correspondence with LME experts**

Included the paper, Large Marine Ecosystem Approach to Marine Resource Assessment and Management (Paper for Proceedings of 26-28 September 2006 Bergen Conference on implementing the ecosystem approach to fisheries (CIEAF))

Denmark: O. Vestergaard

Sweden: Jan Thulin

Iceland: O. Astthorsson

Norway: Hein Rune Skjoldal

Russia: G. Matishov

Canada: R. Siron

Greenland: E. Sorensen

Finland: Maija Pietarinen

To the Members of the LME expert study group of PAME:

We have received encouragement to move forward, based on the deliberations of the last PAME meeting. The purpose of this initial correspondence is to invite you, in recognition of your expertise and interest in PAME activities, to serve as a member of an expert study group of PAME and to participate in the deliberations for introducing an ecosystem-based approach to the assessment and management of Arctic LMEs.

While the task of selecting a suite of indicators to be used in monitoring changes in conditions of 17 LMEs is challenging, we can benefit from LME experiences where the indicator approach has been most useful. The case studies we can benefit from include 40 years of experience in management and assessment of changing states of the Northeast shelf LME, and in results forthcoming from applying this approach to the Benguela Current LME by Angola, Namibia and South Africa, and to the Guinea Current LME through the efforts of 16 countries in West Africa. In both of these cases, productivity and fish and fisheries measurements were taken during survey operations conducted aboard the Norwegian vessel *Nansen* with the assistance of Norwegian scientists and technicians. We now have the benefit of other start-up operations being conducted by Norway: one in the Bering Sea in cooperation with the Russian Federation, the other in the Norwegian Sea. In effect we have considerable experience and expertise to draw from within the group, including the activities underway in the Baltic Sea LME project that include application of all 5 modules: productivity; fish and fisheries; pollution and ecosystem health; socioeconomics; and governance. The reports to ICES from Iceland are indicative of long term assessments of the Iceland Shelf LME, and there are ICES reports from Canada, Denmark, Sweden, and Finland. Attached is a description of the generic broad-scale modules to the U.S. Northeast Shelf ecosystem ("The Large Marine Ecosystem Approach to Marine Resources Assessment and Management"). Insights into the kinds of assessments to be made on socioeconomics and governance can be found in the Handbook on Governance and Socioeconomics of Large Marine Ecosystems, that is based on a GEF-supported workshop that was conducted in March 2006, on the web at [www.iwlearn.net/abt\\_iwlearn/pns/learning/lme-gov-handbook.pdf](http://www.iwlearn.net/abt_iwlearn/pns/learning/lme-gov-handbook.pdf). Another handbook

on indicators for integrated coastal and ocean management is available at the IOC website at <http://ioc3.unesco.org/icam/>.

From our experience to date, we would be dealing with 2 classes of indicators:

1) Those that are generic, broad-scale, and responsive to generic sources of stress, as identified by Jackson et al. in *Science* 293, 27 July 2001, where the authors highlight 5 principal causes of LME degradation: fishing, pollution, habitat destruction, introductions of non-indigenous species, and climate change, for this generic approach. The application of the 5 LME modules will provide the framework for the appropriate spatial and temporal measurements and assessments of changing ecosystem condition on the broad scale.

2) For the second class of indicators at the smaller scale within the LMEs, it is important to select specific indicators to address high priority stressors for specific LMEs. For example in the Baltic Sea LME, special emphasis will be placed on the effects of dioxins on fish resources as a significant pollution and ecosystem health issue for mitigation. Monitoring and assessment of persistent organic pollutants and persistent toxic substances would be a high priority for the Arctic LMEs with relation to sub-lethal toxic effects on humans, marine mammals and marine birds, whereas the reduction of ice cover and mass would be addressed principally in relation to large ecosystem-wide effects.

Within the context of this 2-level indicator strategy, it would be useful if we could reach consensus on large-scale generic measurements across all 17 LMEs to provide a common baseline, and specific indicators of LME condition at the smaller scale. Given our collective experience, I would envision pursuing these deliberations initially through correspondence, and in two months time discussing the results of these deliberations at a workshop to be convened over a 2 day period in late spring or early summer. Your views on this approach would be most welcome.

Very best regards,

Ken

## **2) 24 April 2007 e-mail correspondence with LME experts**

LME Expert Study Group of PAME

Canada: Robert Siron

Denmark: Ole Vestergaard

Finland: Hermanni Kaartokallio

Greenland: Eskild Lund Sorensen

Iceland: Olafur Astthorsson

Norway: Hein Rune Skjoldal

Russia: Gennady Matishov

Sweden: Jan Thulin

United States: Kenneth Sherman

To the Members of the LME Expert Study Group of PAME:

To address the task of selecting a suite of indicators to be used in monitoring changes in conditions of the 17 Arctic LMEs, we are sending you references and websites for published results of applications of the LME 5-modular approach, for your review and comments. We ask your thoughts on whether you are willing to agree to this generic approach and how to suggest a way forward.

A key factor in reaching a determination on the status of ecosystem condition is the quantitative output from 5 modules of spatial and temporal indicators of ecosystem: productivity; fish and fisheries; pollution and ecosystem health; socioeconomics; and governance.

### **1) Productivity:**

For this module, we recommend the book by Hein Rune Skjoldal, “The Norwegian Sea Ecosystem” (2004, Tapir Academic Press, Trondheim, 559p). Other examples of applications are the chapter on “Zooplankton-fish interactions in the Barents Sea”, by P. Dalpadado, B. Gostad, H. Gjosoeter, S. Mehl, and H.R. Skjoldal, in: “Large Marine Ecosystems of the North Atlantic—changing states and sustainability”, edited by Kenneth Sherman and Hein Rune Skjoldal (Elsevier 2002. 449 pages. 269-292). We have several examples of applications of time series data collected from ships, satellite remote sensing, and continuous plankton recorder that have been used effectively, as depicted in the powerpoint presentation by Svein Sundby, “Marine ecosystems and fish stocks under climate variability and change” (electronic file available upon request), and in the paper by Astthorsson & Vilhjalmsón, “Iceland Shelf LME: Decadal Assessment and Resource Sustainability”, in “Large Marine Ecosystems of the North Atlantic—changing states and sustainability”, edited by Kenneth Sherman and Hein Rune Skjoldal (Elsevier 2002, 219-244). Also available in the same volume is a paper by K. Sherman, J. Kane, S. Murawski, W. Overholtz, and A. Solow on “The US Northeast Shelf Large Marine Ecosystem: Zooplankton Trends in Fish Biomass Recovery” (195-216). Should you not have access to the North Atlantic volume, we can provide electronic copies of the chapters of interest.

### **2) Fish and Fisheries:**

On the application of the Fish and Fisheries module, we recommend the conduct of seasonal surveys of demersal and pelagic fish, following, once again, the Norwegian approach, and also the US Northeast Continental Shelf approach (the results of Northeast Shelf surveys are available at the Northeast Fisheries Science Center (NEFSC) at [www.nefsc.noaa.gov/nefsclibrary/](http://www.nefsc.noaa.gov/nefsclibrary/)). We also recommend the presentation of data to be found in the annual publication of Our Living Oceans (available on the web at: [www.st.nmfs.gov/LivingOceans.html](http://www.st.nmfs.gov/LivingOceans.html)), which takes into consideration several levels of quantification required for fish stock assessments. Fish stock assessments pertinent to an ecosystem-based approach are described on the websites of ICES, at: [www.ices.dk](http://www.ices.dk), and of the Northeast Fisheries Science Center (SOS status of the stocks report, at: <http://www.nefsc.noaa.gov/sos/index.html>, and Northeast regional stock assessments (SAW/SARC), on the web at: [www.nefsc.noaa.gov/nefsc/saw/](http://www.nefsc.noaa.gov/nefsc/saw/)).

### **3) Pollution and Ecosystem Health:**

For this module, we recommend the application of the 5 indicator suites developed and described by the U.S. Environmental Protection Agency (EPA) in the National Coastal Condition Report 2, available at: <http://www.epa.gov/owow/oceans/nccr2/>.

#### **4) and 5) Socioeconomics and Governance:**

These are the least developed modules, presently best described in the Handbook on Governance and Socioeconomics of Large Marine Ecosystems, on the web at: [www.iwlearn.net/abt\\_iwlearn/pns/learning/lme-gov/handbook.pdf](http://www.iwlearn.net/abt_iwlearn/pns/learning/lme-gov/handbook.pdf).

With these 5 suites of indicators I believe it will be possible to provide assessments of the changing state of Arctic LMEs at the generic broad scale. Finer scale measurements will be contingent on more localized issues such as hotspots of persistent organic pollutants or persistent toxic substances (PTS). General descriptions of the context within which a GEF-supported LME project would apply these suites of indicators is attached. The International Waters (IW) focal area of the GEF Strategic Operational Guidance for the period 2007-2010 is focused around 3 themes: Fish and Fisheries and LMEs; Nutrient over-enrichment and LMEs; and Freshwater in relation to Drainage Basins. The 4th Theme is pertinent to our interest in ice melt and its effect on Arctic LMEs, and glacial ice melt in terrestrial ecosystems including the Himalayas and the Andes and the effects on their drainage basins. The GEF is allocating \$345 million to address the negative impacts that overfishing, nutrient over-enrichment, water conflicts and climate change/ice melt will have on the global economy of developing nations and those nations that are recipients of GEF grants. The Russian Federation as a GEF-recipient country is eligible for funding to support the kinds of generic indicators under consideration by the LME Expert Study Group of PAME (LME ESG). Dr. Marie-Christine Aquarone will be assisting the LME ESG in our deliberations for reaching consensus. Dr. Aquarone will explore the possibility of holding at least one phone conference to discuss the way forward. We look forward to receiving your comments on the suggested “generic categories”.

Ken

#### **Annex 2**

(a) Large Marine Ecosystem Approach to Marine Resource Assessment and Management (Paper for Proceedings of 26-28 September 2006 Bergen Conference on implementing the ecosystem approach to fisheries (CIEAF). Available upon request or can be downloaded from the list of documents distributed for this meeting from the password protected area of the PAME homepage

(b) GEF document

#### **Annex 3**

**Draft of the West Bering Sea LME Project Proposal.** Available upon request or can be downloaded from the list of documents distributed for this meeting from the password protected area of the PAME homepage

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