

# ACA Scoping Workshop

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**Oslo, 28-30 September 2011**

## **Workshop Report**

Final Version 7 November, 2011



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## Introduction

### *Background*

Over the past 20 years, numerous ‘thematic’ assessments have been produced concerning the Arctic, both by groups working under the Arctic Council and others. Some of these assessments address future change; some include policy-relevant recommendations. A few have attempted to ‘synthesize’ information from different subject areas, typically where the linkages are obvious.

Against a background of unprecedented recent changes in the Arctic, largely related to climate change, decision-makers are increasingly calling for assessments that are not only-multi-disciplinary in nature, but that also integrate information from diverse subjects in a manner that is more useful for informing policy- and decision-making processes.

The ‘Arctic Change Assessment’ (ACA) was therefore conceived as a process for bringing together information from various ‘thematic’ assessments that have already been conducted, and those that are planned to deliver information during the period from 2012 to 2015, in order to prepare, by 2017, an assessment that truly integrates multiple perspectives on Arctic change and its impacts on the Arctic environment, ecosystems and societies.

These ideas are reflected in the ‘ACA prospectus’ from 31 March 2011, and in the Senior Arctic Officials (SAO) report to the Ministers.

At the Arctic Council (AC) Ministerial meeting 12 May 2011 in Nuuk, Greenland, it was decided that a scoping exercise should be arranged during autumn 2011 to clarify the scope and organizational aspects of the proposed integrated assessment of multiple drivers of Arctic change – the Arctic Change Assessment. The outcome of this scoping workshop was the foundation for the proposal prepared for the SAO meeting in November 2011.

### *About this report*

This report presents minutes from the Arctic Change Assessment Scoping Workshop, held in Oslo on 28-30 September 2011. The scoping workshop was attended by about 110 participants from all Arctic countries, permanent participants, local governments, Arctic Council Working Group representatives, observing countries and organizations, and representatives of a wide range of stakeholder groups (e.g., shipping, oil and gas, mining, tourism).

The minutes are arranged according to agenda items. The following annexes are also included:

Annex 1: Agenda

Annex 2: List of Participants

Annex 3: Chairs and Rapporteurs for Breakout Sessions

Annex 4: Outcome of Breakout Session 1 discussions

Annex 5: Outcome Breakout Session 2 discussions

Annex 6: Quotes received after the ACA Scoping Workshop

Annex 7: Arctic Change Assessment (ACA) Proposal to SAOs

Presentations in Agenda Items 5 and 6 and background documents for the ACA process can be downloaded from:

<http://amap.no/workdocs/index.cfm?dirsub=%2FArctic%20Change%20Assessment%20%28ACA%29%2FACA%20Scoping%20Workshop%20-%20Oslo%20-%20September%202011&sort=default>

## **Minutes of the ACA Scoping Workshop**

### **1 Opening of the Workshop**

Karsten Klepshvik, Norwegian Senior Arctic Official, Ministry of Foreign Affairs, Norway, opened the Arctic Change Assessment (ACA) Scoping Workshop at 10:00 on 28 September 2011 and welcomed the participants to Oslo. He noted that the proposed project may be one of the largest of the Arctic Council and this scoping workshop with 120 participants will provide an important basis for this work.

### **2 Welcome to the Workshop**

Erik Lahnstein, State Secretary to the Ministry of Foreign Affairs in Norway, stated that policy on the High North is very important to the Norwegian government, which has worked for the past six years to strengthen the knowledge base and activities in the Arctic. He welcomed the Arctic Change Assessment, as only through cooperation can the Arctic countries deal with the challenges of the region. The ACA Scoping Workshop is the beginning of what he hoped would be a flagship project of the Arctic Council. This will be a challenging endeavor, but it will also be rewarding to the participants and to the greater society.

He noted that during the first decade of cooperative work in the Arctic, AMAP concentrated on pollutants, creating an important basis for major decisions to reduce pollutants. During the second decade, the focus was on climate change in the High North, resulting in descriptions of changes in the Arctic that have been clear and also very disturbing. The current decade calls for expanding the scope of the work to prepare for the changing conditions as it is too late to stop the process of climate change or the other key drivers including demographic changes and the need for resources.

The aim of ACA is to bring together existing knowledge, create new knowledge, and try to understand all the combined effects. This requires creativity, a broad range of expertise, and interactions between policy-makers, scientists, and practitioners to be fruitful.

Ambassador Gustav Lind, Chair of the Arctic Council, Ministry of Foreign Affairs, Sweden, noted that the major changes impacting the Arctic region and its inhabitants necessitate the development of new strategies for assessment, management, and action. The ACA Scoping Workshop seeks answers to how to approach this. Two days ago the first event in the Swedish chairmanship was opened in Stockholm with the start of work on the Arctic Resilience Report, which will be part of the ACA. Today, the opening of the ACA Scoping Workshop represents the largest and most ambitious project under the Swedish chairmanship. One of the ambitions under the Swedish chairmanship is to increase cross-sectoral work within the Arctic Council and the work with ACA until 2017 will create opportunities to achieve this. He stated that he was impressed by the participants list for the workshop, which includes broad participation by representatives from industry, universities, government agencies, NGOs, and indigenous peoples, as well as all Arctic Council Working Groups, who are co-leading the ACA.

Karsten Klepšvik thanked AMAP for preparing for and organizing this scoping workshop, emphasizing that all Arctic Council WGs will be involved in this work. He then handed over the chair to Barry Goodison (WMO) to chair the workshop.

### **3 Tour de Table**

The Chair of the Workshop, Barry Goodison, noted the large interest in polar work and the excellent mix of participants from different backgrounds at the workshop.

There was then a tour de table of all participants, who introduced themselves and their area of interest and expertise.

### **4 The Goal of the Workshop**

The Chair summarized the goals of the workshop, emphasizing that this is an Arctic Council initiative in which all WGs should be involved. Consideration of the issue of overall change in the Arctic was authorized in the Nuuk Declaration by the Seventh Arctic Council Ministerial Meeting in May 2011 as follows:

**“Direct SAOs to review the need for an integrated assessment of multiple drivers of Arctic change as a tool for Indigenous Peoples, Arctic residents, governments and industry to prepare for the future, and, based on that review, to make recommendations for consideration by Arctic Council Deputy Ministers at their next meeting of a possible Arctic Change Assessment, including an Arctic Resilience report,”**

The main task for an Arctic Change Assessment is to clarify the significant consequences of some of the main drivers of change on Arctic ecosystems and peoples. Key concepts for the work are integration and regionalization to develop options for actions, especially adaptation. The Arctic region and its inhabitants are undergoing significant change due to increases in climate change impacts, human demographic shifts, industrialization, shipping traffic, demands for natural resources (renewable and non-renewable), culture shifts, and long-range transport of pollution. Many of these drivers of change will result in cumulative effects that are interlinked, resulting in challenges that require new strategies for assessment, administration and management of these issues. Several important Arctic issues have been addressed by AC WGs over the past decades through the conduct of specific (thematic) assessments, and by major Arctic research programmes, but there has been no major integrative approach to consider the cumulative impacts of some of the most important drivers, which will be necessary for the development of proper adaptation strategies.

The Chair showed a conceptual diagram of a proposed ACA process under which an update of the knowledge on the scientific, technical, and socio-economic aspects of change across the circumpolar Arctic region would be prepared and integrated to serve as a rigorous and balanced basis for decision-making. This will be mainly based on existing work, so in preparation for this workshop, a questionnaire had been distributed to identify ongoing activities and projects of relevance to an Arctic change assessment. More than 120 projects have been identified in responses to this questionnaire, which have been compiled into one document.

The immediate objective of this workshop is to develop a proposal for terms of reference for an Arctic Council-led project to address cumulative effects of changes in the Arctic, culminating in an integrated synthesis and assessment of these effects.

## **5 Assessment of change—expectations and challenges**

Martin Fortier, Executive Director of ArcticNet, Canada, described the use by ArcticNet of Integrated Regional Impact Studies (IRIS) of the changing Canadian Arctic to inform stakeholders and policy-makers. ArcticNet, hosted at Université Laval in Quebec City, is one of 14 Networks of Centres of Excellence jointly funded by the three research councils of Canada and Industry Canada. It is currently in its second seven-year cycle (2011–2018). One of the general objectives of ArcticNet is to help translate the growing understanding of the changing Arctic into impact assessments, and national and global policies and adaptation strategies. Accordingly, he stated that this Arctic Council initiative fits well with ArcticNet.

Martin Fortier described the network management structure, driven by the user sector, which includes a Research Management Committee with 35 research projects funded in 2011 to 2014 on natural, human health and social sciences over the entire Canadian coastal Arctic. About 140 researchers from 30 universities and 20 government agencies are contributing to four Integrated Regional Impact Studies covering eight to nine topics each. As an example, in the report ‘Nunavik and Nunatsiavut: from science to policy. An integrated regional impact study of climate change and modernization’, Part I contains a science to policy synthesis covering four priority issues: human health, safety and security, municipal and transportation infrastructures, and socio-economic development and resource exploitation. Part II of this report contains twelve scientific chapters describing past and recent climate trends and projections of their expected changes on a range of key issues. Another ArcticNet activity concerns providing information on the effects of climate change to the great number of communities in Arctic Canada built on permafrost.

Challenges include the identification of major stakeholders and ensuring their involvement in the entire process, the downscaling of models and scenarios to the regional level, defining appropriate regions for assessments, and the production of assessments aimed at policy-makers. The timing of the ACA is well aligned with the timeline for production of ArcticNet assessments and he expected good collaboration between the projects.

Martin Sommerkorn, WWF Global Arctic Programme, described one means of obtaining an assessment that informs policy. The project Rapid Assessment of Circum-Arctic Ecosystem Resilience (RACER) brought together experts to identify key features that confer ecological resilience to marine and terrestrial ecosystems. This began with the need to define a framework and an endpoint, including defining the Arctic of tomorrow: what do we want the Arctic to look like? This needs to be defined first to be able to define what needs to be done to achieve it. The scale to focus on also needs to be determined, to be relevant to people and to relevant ecosystems. There is also a need to agree on credible, realistic and relevant driver scenarios and, wherever possible, alternatives. It is also important to integrate drivers; this is difficult, but preparing an integrated map is one possibility. Resilience may also be a core concept to maintain

the Arctic identity through rapid change, with a view to adaptive capacity, vulnerability, thresholds, etc.

Colleen Henry, Arctic Athabaskan Council (AAC), reviewed the perspectives and needs in an Arctic change assessment. She stated that the overall purpose of such an assessment should be to understand and influence change by engaging key sectors, transferring information from sector to sector, and preparing recommendations for all sectors. It should be applied not academic, and iterative not linear. Key outcomes should be the promotion and improvement of 1) education at all levels, 2) research and integration of natural and social sciences and traditional knowledge, 3) domestic governance, 4) collective circumpolar governance, and 5) the development of key messages for international and global institutions. For example, challenges in northern Canada include the lack of universities in the North, inadequate infrastructure, and the need for community-based research and researchers. Top concerns in the Yukon include climate change, wildlife, food and water security, landscapes, and human concerns; most of these are also future concerns. The great majority of people in the North feel that traditional or local knowledge can play a role in finding solutions for climate change planning, together with science.

Svein Mathiesen, International Centre for Reindeer Husbandry, stated that approximately 100,000 people work with reindeer husbandry spanning from northern Norway to Chukotka, mostly in Russia. Climate change will affect their work tremendously. Global and regional climate scenarios project dramatic changes in these areas, and an 8 °C difference will have a major impact in both winter and summer. Other major changes include oil and gas development and degradation of the environment with infrastructure and roads. Furthermore, the salary in the oil and gas industry is far larger than that from reindeer herding. With these changes, it will be difficult to maintain the traditional culture of the Indigenous Peoples. There is a societal cost of adaptation and degradation. This emphasizes the need to engage indigenous societies and particularly the indigenous youth in the ACA process.

Frigg Jørgensen, Association of Expedition Cruise Operators (AECO), spoke about cruise tourism in the Arctic. AECO includes about 20 vessels operating in the area from Svalbard to Jan Mayen and Greenland. She stated that the objectives of her association are to ensure environmentally friendly, safe cruise experiences in the Arctic. AECO has prepared guidelines on environmental considerations regarding vessels, fuel types, and protection of fauna and vegetation; safety considerations; and cultural and social considerations. There is a long tradition of cruise tourism in the Arctic and ACA should acknowledge the economic importance of such tourism. Although the growth in tourism has been slow, there has been a recent increase in local investment in tourism.

## **6 Presentation of the outcome of the ARR workshop in Stockholm**

Annika Nilsson, Stockholm Environment Institute, presented the highlights from the Scoping Workshop for the Arctic Resilience Report (ARR) that was held in Stockholm on 26–28 September. The ideas behind resilience are that ecosystems, social systems, and social-ecological systems are self-organizing and the ecological and social domains are strongly interlinked. However, there are limits to how much a system can change and still recover; beyond those limits, the system functions differently and changes to some other state that is not easily

reversible. One example of this is the change from shrub landscapes to grassland in the Siberian tundra. Resilience has been defined as ‘the capacity of a system to absorb disturbance and reorganize so as to retain essentially the same function, structure and feedbacks – to have the same identity’.

A resilience assessment comprises three steps: 1) defining the system – resilience of what and to what, including system boundaries, scales, stakeholders; key assets, values, ecosystems; and disturbances, shocks, trends and drivers; 2) determining the system dynamics (assessing resilience), including thresholds and controlling variables, general resilience and adaptability, and transformability; and 3) determining the implications. A matrix can be prepared of the interacting thresholds across scales and social, economic, and biophysical domains to test the shocks to the system and ways to increase its resilience.

A distinguishing feature of the ARR is that it will focus on changes that have associated thresholds that, if crossed, may imply a permanent change of state or function for some component of the Arctic system. In this context, the ARR will form an important complementary contribution to the ACA process.

The ARR project will work via a series of workshops, with an interim report at the 2013 Arctic Council Ministerial Meeting and a final report at the 2015 Ministerial Meeting.

## **7 Breakout Session 1**

Six multidisciplinary groups were created for Breakout Session 1, which were requested to consider seven questions concerning the potential objectives of an Arctic change assessment, the information needs it could supply, the types of products that would be useful, the drivers and pressures it should address, and criteria to prioritize the work. Chairs and Rapporteurs of these Breakout Sessions are listed in Annex 3.

After some discussion, the six groups summarized what they considered to be the key issues in relation to an ACA, as follows:

Group 1: There is a need to consider the scales; there is a need to go from the wide, broad scale to more local scales to determine the changes and what is manageable to accomplish.

Group 2: The process is very important. There is a need for flexibility and to produce something that is useful. There is a need to prepare for the changes and have communities that can be ready to adapt and to have professionals to work with them to deal with the changes.

Group 3: A key issue is the need for flexibility and resilience in planning the ACA because the system is so complex that there is a need to be able to change the work. The process is more important than the product and thus there needs to be a process for modifying the work and modifying the interim products along the way.

Group 4: The outcome of this work should be easily accessible reports, not ‘bricks’ on a bookshelf.

Group 5: The audience for this assessment should be broadened by identifying the full range of stakeholders. The group identified the family unit as the local scale for this work. There is a role for the preparation of intermediate products in this assessment.

Group 6: There is a need to have ACA outcomes that can be used on the regional and local scales. There is also a need to have an array of deliverables ranging from those for scientists to layman's reports and all in between.

The following day, the Chairs of each of the six groups gave more detailed presentations of the outcomes of their discussions of each of the seven questions. These presentations contained a broad range of ideas and suggestions, and are compiled in Annex 4.

In the discussion of these presentations, it was emphasized that the ACA process is its legacy and the process is more important than its products. The communication strategy is very important and flexibility, new ways, and new tools should be used to disseminate the information, which should be geared to different types of audiences from scientists to policy-makers to Arctic communities. The work should cover different scales from the pan-Arctic down, and the appropriate downscaling of models will need to be considered. Stakeholder participation is very important and it would be useful to engage Arctic youth.

## **8 Introduction of on-going activities**

Christine Daae Olseng, AMAP Deputy Executive Secretary, introduced the list of more than 120 relevant projects that had been reported in response to a questionnaire that she had sent out in advance of the meeting. This list was not complete, as it was still missing relevant Arctic Council projects among others. This document is meant to be a "living" document that will be updated when necessary. This document is available at

<http://amap.no/workdocs/index.cfm?dirsub=%2FArctic%20Change%20Assessment%20%28ACA%29%2FACA%20Scoping%20Workshop%20-%20Oslo%20-%20September%202011&sort=default>

## **9 Breakout Session 2**

The seven groups composed for Breakout Session 2 aimed to explore the issues from a thematic perspective. The seven groups were as follows:

Group 1: Climate, hydrology/modelling, etc.

Group 2: Climate/pollution

Group 3: Energy/oil and gas/shipping

Group 4: Local and regional development – human health, indigenous peoples, etc.

Group 5: Local and regional development – economy/tourism/climate

Group 6: Local and regional development – terrestrial ecology, reindeer

Group 7: Local and regional development – marine ecology/fishery/climate

Chairs and Rapporteurs are listed in Annex 3. These groups were initially requested to focus on the purpose of the ACA. After discussion, the group Chairs summarized their considerations, as follows:

Group 1 (Climate, hydrology/modelling, etc.): The purpose of ACA should be to identify and analyze major primary and higher-order drivers and impacts of changes in the Arctic and their effects on living conditions in the Arctic in order to contribute to an informed basis for decision-making at the Pan-Arctic, regional and local scales and inform the global society of major Arctic changes. There is a need to develop a matrix for primary and secondary drivers of changes and their impacts on key issues to be covered by ACA together with estimates of their importance and scales of impact. Such a matrix should also be prepared for major climate change impacts, for uncertainties and for data availability. Possible gaps need to be identified and regionalization needs to be decided on. Climate change in the Arctic has a great impact on the rest of the world and the Arctic Council has a mandate and requirement to inform about this. It is important that products are made available throughout the lifetime of the project and that a portal for relevant information is created as the project develops.

Group 2 (Climate/pollution): The general purpose of ACA is to make scientific information much more applicable to the general public, policy-makers, industry, etc. This will require integration, which will be a challenge, and the involvement of all stakeholders, which implies moving away from using only peer-reviewed literature. There is a need to develop a template to bring together all ongoing activities and modify them as needed. Climate change is a major overarching driver. Pollution from industry is another driver and also the most documented issue in the Arctic. Building on existing multidisciplinary data and meta-data repositories, new integration tools can be defined and developed. The management structure will be critical to this work; a clear organizational structure should be developed and participating organizations should make a specific commitment to the principles and work of ACA. Expectations should be kept realistic.

Group 3 (Energy/oil and gas/shipping): The purpose of ACA should be to provide information and guidance to help decision-makers to decide on future development in the Arctic to attain a sustainable use of industrial opportunities, taking care of local needs, being socially responsible, and using ecosystem-based management to sustain ecosystem services. Integration, scaling, and industry participation and support are important to this work, which should provide tools and facilitate the development of integrated management plans. While some issues are pan-Arctic, most are regional; however, issues at a pan-Arctic level can be used to develop tools and input for integrated assessments at regional and local levels. It is important to identify critical gaps in knowledge and policy-making. A major change in thinking is required and the work should be continuous and include all Arctic Council Working Groups.

Group 4 (Local and regional development – human health, indigenous peoples, etc.): The purpose of ACA should be the improvement of human life in the Arctic in a changing climate and environment. One of the top priorities is the need to integrate and to create a new working framework including better communications at all levels, e.g., among health workers, among administrators. Cultural identity is an important factor in the Arctic. Corporate social responsibility is also an important factor in industrial development and the exploitation of

resources to ensure sustainability. Further development of education and capacity building is also crucial. Climate change impacts on health and well-being need to be addressed. ACA should build on existing and ongoing programs.

Group 5 (Local and regional development – economy/tourism/climate): The focus of ACA should be a user-driven agenda and analyses to underpin the assessment; this strategy should engage the user communities continuously with feedback and engagement. The framework should focus on the peoples of the Arctic, the resources of the region and its institutions, set in a global context. Basic drivers are the need for food, energy, and clean water, as modulated by cultural settings, policy and regulations, and human well-being. Goals and objectives need to be linked to indicators that can measure the status and trends. New vehicles of communication will need to be implemented and more frequent, and often more targeted, products should be prepared to disseminate information to stakeholders, policy-makers, and communities. A number of industry and educational organizations are ready to contribute to the ACA.

Group 6 (Local and regional development – terrestrial ecology, reindeer): The ACA should provide adaptation and transformation options for managing change (maximizing benefits and minimizing risk) by focusing on social-ecological systems; providing policy relevance across scales; focusing on critical drivers and drivers that can be influenced; integrating knowledge systems; learning from success stories and history; and improving the capacity to make integrative projections. Integration is needed on many levels, and finding appropriate models to help integration should be a priority. A multi-scale approach is needed because the scales of the social-economic system are all connected and integrated. Cross-scale interactions affect the dynamics of a complex social-ecological system, requiring approaching each topic across several scales. There is a need for a level playing field for the topics to be integrated. Important issues include land use, biodiversity and ecosystem services, and indigenous traditional knowledge versus Western science.

Group 7 (Local and regional development – marine ecology/fishery/climate): This work should be renamed ‘Arctic Futures’ and the term ‘assessment’ removed. There should be a common purpose and approach. Scenario development should be updated annually or biannually and based on best available, up-to-date integrated data. The key audience should be politicians and stakeholders including at the local level, with strong two-way communication. The work should cover a pan-Arctic scale with regional applications also covering local concerns. A small advisory panel should be created with the principal task to identify and respond to key issues of concern in a timely fashion, with the aim to shorten the response time. This work should be housed in the Arctic Council Secretariat.

Further details of the presentations are given in Annex 5.

In the discussion of these presentations, it was considered that an innovative management-driven framework is required for this work. Stakeholders currently outside the Arctic Council sphere also need to be included. The Network Management Scheme of ArcticNet was reviewed and considered to be a useful model, although it was pointed out that it will need to be tested to make sure that it is fully applicable for the Arctic as a whole. However, this type of structure could be supplemented by additional groups and regional structures, as necessary. The management

structure should make clear that this is an Arctic Council-driven process that includes Permanent Participants and indigenous peoples' organizations; the relationship to current Arctic Council Working Groups should also be clear. It was further suggested that it would be useful to establish an advisory board at the stakeholder level.

A small team should develop this framework, and it was agreed that the work should be considered user-inspired rather than user-driven.

## **10 Stakeholder perspectives**

A representative of the shipping industry stated that they want to see industrial development in the Arctic; local people should also welcome industry, but there is a need to have clear environmental standards. The shipping industry is very aware of the environmental issues and the expectations of customers regarding environmental protection.

A representative of the oil and gas industry stated that that industry has decreased its footprint in the past two decades and is applying environmental standards. ACA should be practical as industry can work together with the scientists and indigenous peoples. The industry wants to make this project a success in a dynamic manner.

From local government, a representative said that, with a more user-driven process, there is a need to consider the inclusion of regional governments as well as the process to develop proposals for actions.

It was proposed that a committee be established or a workshop held to obtain further industry input, which should be more specific than that given at this workshop.

An adaptive management approach with stakeholders, policy-makers, and scientists was suggested as a good model to follow.

## **11 The way forward: Conclusions from the scoping workshop and a tentative time schedule for the work. The report to the SAO meeting in November**

The next steps will be as follows:

A proposal must be developed for Senior Arctic Officials/Permanent Participants by 7 October, for discussion at the SAO meeting on 7–8 November. This proposal will be prepared over the weekend and sent to Arctic Council Working Groups by Sunday, 2 October, with comments required by Tuesday, 4 October so that the proposal can be sent in on Friday, 7 October. This time frame is challenging as AMAP and other Working Groups are meeting next week. The proposal will also seek views and guidance from SAOs for the further planning of this work so that it can feed into policy development in the Arctic Council and elsewhere.

A draft report of this workshop will be prepared and distributed to all workshop participants for their review and comment in October.

A plan will be developed and consideration will be given to holding a smaller follow-up workshop before the spring SAO meeting to make a more detailed proposal including a management framework.

## **12 End of the ACA Scoping Workshop**

In closing, the AMAP Chair, Russel Shearer (standing in for the Workshop Chair Barry Goodison) invited participants to offer their comments on the workshop and these comments are compiled in Annex 6. He thanked all the participants for their input on this potentially game-changing work and closed the meeting at 12:30 on 30 September.

## Annex 1

# ACA Scoping Workshop

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## AGENDA

**Time:** Starting at 10:00, 28 September and ending 30 September at 15:00

**Venue:** Oslo, Norway.

### Wednesday 28 September

Venue: Radisson Blu Plaza hotel, Sonja Henies plass 3.

**09.00 - 10.00 Registration and Coffee**

#### Plenary session 1

**10.00 - 10.10 Opening** (Chair: Barry Goodison)

**10.10 - 10.30 Welcome to the workshop**

Erik Lahnstein (State Secretary to the Ministry of Foreign Affairs, Norway)

Gustaf Lind (Arctic Council Chair, Ministry of Foreign Affairs, Sweden)

Karsten Klepsvik (Norwegian SAO, Ministry of Foreign Affairs, Norway)

**10.30 - 10.40 Practicalities** (Lars-Otto Reiersen)

**10.40 - 11.10 Tour de Table** – presentation of participants

**11.10 - 11.40 The Goal of the Workshop. Introduction by the Chair, Questions and answers** (Chair: Barry Goodison)

**11.40 - 12.40 Assessment of change-expectations and challenges**

*Informing stakeholders and policy through Integrated Regional Impact Assessments of the changing Canadian Arctic* (Martin Fortier, ArcticNet).

*Designing rules according to purpose: challenges for a pan-arctic assessment informing mitigation and adaptation to change* (Martin Sommerkorn, WWF)

*Arctic Change Assessment Perspectives and Needs* (Colleen Henry, AAC)

*Global Change, Adaptation and Knowledge in Arctic Indigenous Nomadic Communities*  
(Anders Oskal, Saami Council)

*Cruise tourism in the Arctic* (Frigg Jørgensen, AECO)

**12.40 - 12.45 Arrangement for the Breakout Session 1**

**12.45 - 13.45 Lunch**

### **Breakout Session 1**

**13.45 - 15.00 Integration perspectives**

A number of breakout groups will be established.

**15.00 - 15.30 Coffee and brain food**

### **Plenary session 2**

**15.30 - 15.50 Presentation of the outcome of the ARR workshop in Stockholm** (Annika Nilsson)

**15.50 - 16.10 A short summary of the work done so far at the ACA workshop** (Chair: Barry Goodison)

### **Breakout Session 1 cont.**

**16.10 - 18.00 Breakout Session 1 cont.**

**18.00 End of day one**

**19.30 Workshop dinner at Opera house**

**Thursday 29 September**

Venue: The Norwegian Climate and Pollution Agency, Strømsveien 96.

### **Plenary session 3**

**09.00-10.50 Reporting from Breakout Session I** (Chair or rapporteurs)

**10.50 - 11.10 Coffee**

## **Breakout Session 2**

**11.10 - 11.20 Introduction of Breakout Session 2** (Chair: Barry Goodison)

**11.20 - 11.30 Introduction of on-going activities** (Christine Daae Olseng)

**11.30 - 12.30 Thematic perspective**

A number of breakout groups will be established. This session will go deeper into the key issues identified in Breakout Session 1.

**12.30 - 13.30 Lunch**

**13.30 - 15.00 Breakout Session 2 cont.**

**15.00 - 15.30 Coffee and brain food**

**15.30 - 18.00 Breakout Session 2 cont.**

**18.00 End of day two**

## **Friday 30 September**

Venue: The Norwegian Climate and Pollution Agency, Strømsveien 96.

## **Plenary session 4**

**09.00 - 10.30 Reporting from the Breakout Sessions** (Chair or rapporteurs)

**10.30 - 11.00 Coffee**

**11.00 - 11.15 Deliverables – reports, expected in the period 2011 – 2017** (Chair: Barry Goodison)

**11.15 - 12.30 Summing up the main outcomes and recommendations** (Chair: Barry Goodison)

**12.30 - 13.30 Lunch**

**13.30 - 15.00 The way forward: Conclusions from the scoping workshop and a tentative time schedule for the work. The report to the SAO meeting in November** (Chair: Barry Goodison)

**15.00 End of the ACA Scoping Workshop**

## Annex 2 List of Participants

Country/ Organization	First name	Last name	Institute name	e-mail
<b>Arctic Council Member Countries</b>				
Canada	Rachel	McCormick	Department of Foreign Affairs, Circumpolar Affairs Division	rachel.mccormick@international.gc.ca
Canada	Shannon	Headland	Department of Foreign Affairs, Canadian International Centre for the Arctic Region	Shannon.headland@international.gc.ca
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### Annex 3

## Chairs and Rapporteurs for Breakout Sessions 1 and 2

#### Breakout Session 1

<b>Group 1</b>		
<b>Chair</b>	Russel	Shearer
<b>Rapporteur</b>	Victoria	Gofman

<b>Group 2</b>	
Stephanie	Meakin
Odd	Rogne

<b>Group 3</b>		
<b>Chair</b>	Thomas A.	Armstrong
<b>Rapporteur</b>	Lisa	Loseto

<b>Group 4</b>	
Margareta	Johansson
Cassie	Bott

<b>Group 5</b>		
<b>Chair</b>	David	Hik
<b>Rapporteur</b>	Gail A.	Fondahl

<b>Group 6</b>	
Helgi	Jensson
Larry	Hinzman

#### Breakout Session 2

<b>Group 1</b>		
<b>Climate-hydrology/modelling etc.</b>		
<b>Chair</b>	Morten S.	Olsen
<b>Rapporteur</b>	Ari	Laakssonen

<b>Group 2</b>	
<b>Climate/pollution</b>	
Martin	Fortier
Cassie	Bott

<b>Group 3</b>		
<b>Energy/oil and gas/shipping</b>		
<b>Chair</b>	Anders	Mosbech
<b>Rapporteur</b>	Tor Christian	Sletner

<b>Group 4</b>	
<b>Local- Regional development- human health, indigenous peoples etc.</b>	
Jon Øyvind	Odland
Claudette	Fortin

<b>Group 5</b>		
<b>Local and regional development- economy/tourism/climate</b>		
<b>Chair</b>	Robert	Corell
<b>Rapporteur</b>	Janet	Pawlak

<b>Group 6</b>	
<b>Local and regional development- terrestrial ecology, reindeer herding/climate</b>	
Grete	Hovelsrud
Martin	Sommerkorn

<b>Group 7</b>		
<b>Local and regional development- marine ecology/fishery/climate</b>		
<b>Chair</b>	Tom	Barry
<b>Rapporteur</b>	Harald	Loeng

## Annex 4

### Outcome of Breakout Session 1 Discussions

Group	Results of Breakout Session 1 discussions
<p><b>1. What do you hope that an ACA will achieve?</b>  <b>What key questions would various stakeholders like to see addressed in an ACA?</b></p>	
1	<ul style="list-style-type: none"> <li>• Best practices of adaptation to change</li> <li>• Highlighting places that have the highest probability of change</li> <li>• Better understanding of the levels of vulnerability in the Arctic</li> <li>• Better understanding of the interaction of stressors and factors of environmental and economic changes</li> <li>• Better understanding of climate change impacts on a larger scale and what chain reaction they create leading to better understanding of the changes in the Arctic</li> <li>• The society will always have to face climate uncertainty. Could ACA empower the society to face that change?</li> </ul>
2	<ul style="list-style-type: none"> <li>• Practical data that informs decisions in a changing Arctic (politically, environmentally, ...) – forecast these needs so can be proactive and can respond quickly</li> <li>• Ecosystem-Based Management (?)</li> <li>• Cross link all AC working groups’ current programs and past assessments, avoid duplication – build on existing knowledge</li> <li>• Need rolling products throughout—address biggest changes first/key decisions needed to be made</li> <li>• Not an assessment on a specific issue, rather an assessment on Arctic change</li> <li>• Monitoring data (shipping, pollution, offshore activities/ iceberg observations, etc.)</li> <li>• Better instrumentation</li> <li>• Advanced hydrological data</li> <li>• Data sharing – cooperation, inventory, democratization of data/access</li> <li>• ACA Product(s) should serve all stakeholders</li> <li>• Education and outreach (related to Arctic change) and in cold-weather specialties to address future employment needs in the Arctic (new infrastructure, resource development, innovation to take advantage of changes)</li> <li>• Distance learning – meet needs of northern residents, indigenous and local</li> <li>• Meet emerging employment demands to ensure northerners benefit from development</li> <li>• Development of northern companies, codes of practice/regulations/ethics when operating in Arctic.</li> <li>• Data in real time to address changes affecting infrastructure (increased precipitation, thawing permafrost, flooding, etc.)</li> <li>• Developing new technologies/innovation to deal with Arctic change (infrastructure, resource development, social/health, environmental). New solutions</li> <li>• Analyze/evaluate social and economic impacts of change/changes to traditional livelihoods (assessment of heritage and sacred sites)</li> <li>• Adaptation strategies</li> <li>• Tools to keep sustainable communities in Arctic</li> <li>• Needs assessment for Arctic human settlements</li> <li>• Comparability of health data – consistency/standardized methodologies</li> <li>• Integrated research</li> </ul>

3	<ul style="list-style-type: none"> <li>● How do we define success for the ACA? Success is defined as the ACA empowers and enables decision making at all scales and influences policies in such a way as to promote a healthier Arctic</li> <li>● What are the major opportunities in the Arctic?</li> <li>● What are the risks or consequences?</li> <li>● What are the main pressures (forces) that are/will impact the Arctic system (including the natural, human/build environments) in the future             <ul style="list-style-type: none"> <li>○ Can we provide attribution to these drivers to better predict causality to promote more effective mitigation and adaptation</li> <li>○ Can ACA provide an effective framework to address multiple forces and issues that interact</li> <li>○ Framing questions that can be applied to any sector or region under investigation in an assessment</li> </ul> </li> </ul>
4	<p>Key topics:</p> <ul style="list-style-type: none"> <li>● Human health</li> <li>● Water and food security</li> <li>● Access</li> <li>● Migration</li> <li>● Culture</li> <li>● Industrial development</li> </ul>
5	<ul style="list-style-type: none"> <li>● need to ask stakeholders and communities to help identify key issues</li> <li>● discussed idea of (young) family as the most prevalent social unit in Arctic. Families need and use information.</li> <li>● will connect issues to global context</li> <li>● will avoid duplication of other efforts; essential to identify connections between AC and others doing similar work</li> <li>● food security – with understanding that it is different for different regions (fish, pinnipeds, reindeer/caribou)</li> <li>● movement of species, especially fish and implications this has/demands on change in regulator regimes</li> <li>● as part of the ACA process, ensure all the stakeholders are involved. And facilitate this.</li> </ul>
6	<ul style="list-style-type: none"> <li>● Integration, regionalization, need to have holistic view of area</li> <li>● Consider local needs, both environment and humans</li> <li>● Industry needs to have clear rules and</li> <li>● Everyone needs a clear understanding of projected changes</li> <li>● Adapt and mitigate</li> <li>● Consider cumulative stressors</li> <li>● Give local and regional governments the tools to make the right decisions</li> </ul>
<p><b>2. What information is your community/branch/organization lacking when it comes to planning for the future, doing business, or making policy decisions?</b></p>	
1	<ul style="list-style-type: none"> <li>● Inventory of the available knowledge</li> <li>● There is little baseline data at local level, lack of expertise how to process and analyze available data</li> <li>● Models need improvements</li> </ul>
2	<ul style="list-style-type: none"> <li>● What data are available and where (map)</li> <li>● Catalogue of change projects</li> </ul>

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	<ul style="list-style-type: none"> <li>• Downscaling of pan-Arctic climate models</li> <li>• Improve the accessibility of Arctic data</li> <li>• Traditional/indigenous knowledge</li> <li>• Adaptation strategies in partnership with stakeholders</li> <li>• Advanced hydrological modeling</li> <li>• Improved observation coverage (more stations, satellites, etc.)</li> <li>• Increased resolution of monitoring data</li> <li>• New generation of data (satellites)</li> <li>• SAON need to fill black holes – Identify knowledge/data gaps and fill</li> <li>• Planning timeline for AC products – input required so can prepare and participate</li> </ul>
3	<p>For the ACA to be done effectively, an ecosystem based management approach (EBM) should be taken in order to:</p> <ul style="list-style-type: none"> <li>• capture the connectivity of the multivariate system</li> <li>• take a holistic approach to better characterize the system</li> <li>• address feedbacks of multiple drivers</li> </ul> <p>Other information gaps that need to be filled include:</p> <ul style="list-style-type: none"> <li>• better predictive capability (short, medium, long time scales)</li> <li>• downscaled model information in order to make information directly relevant to stakeholders (capture the spatial and temporal scales)</li> <li>• more relevant scenarios for longer range modeling where predictive capability has a high degree of uncertainty</li> <li>• effective coupling of ecosystem, resource and socio-economic models with updated climate models (right scaling)</li> </ul>
4	Needs to be practical for the people living in the area
5	<ul style="list-style-type: none"> <li>• options to inform adaptation strategies over different time periods.</li> <li>• scenarios are important to run as part of all assessments. Scenarios need to be based on scientific knowledge and on different scales, longer temporal frames and they need to be taken to communities and communities asked what they mean</li> <li>• needs to be back and forth communication between those developing ACA and communications in order to avoid ACA sitting on shelf</li> <li>• understanding ecosystems services – or systems services – at both global and regional level</li> <li>• Information model and science model are two different models.</li> <li>• industry collects a lot of data but not well integrated into our networks</li> </ul>
6	<ul style="list-style-type: none"> <li>• Access to data</li> <li>• Information on Tipping points and thresholds</li> <li>• Ecosystem based management; do we have the data for this</li> <li>• Local and traditional knowledge is important for identification of key trends</li> <li>• How can we institutionalize traditional knowledge? Qualitative analyses....</li> <li>• Even in the natural sciences, we use many different methods, better communication would allow better integration of natural science tools</li> <li>• No good methods to measure combined impacts yet</li> <li>• Consequence analysis of different situations.</li> <li>• Risk analysis of future scenarios</li> <li>• Have climate strategy as part of business plan</li> <li>• Will ecosystem services be available in future climate</li> <li>• What are communities’ desires with respect to resource development</li> </ul>

	<ul style="list-style-type: none"> <li>● Improved climate modeling package</li> <li>● Integrated studies that provide downscaled information on a range of variables</li> <li>● Integration of traditional knowledge with modern science, use existing knowledge</li> <li>● Quantitative assessment of social issues.</li> <li>● Characterize the environmental variables affect human health.</li> <li>● Communication between scientific disciplines</li> <li>● How to measure combined effects in general, including contaminant issues, climate change, disturbance</li> </ul>
<p><b>3. What types of products and deliverables could an ACA provide that would be useful for you and when?</b></p>	
<p>1</p>	<p>Establish evaluation of the process and products of ACA from the beginning. Develop interim products to move the process.</p> <ul style="list-style-type: none"> <li>● Policy relevant products <ul style="list-style-type: none"> <li>○ Policy makers do not understand the language of probability</li> <li>○ Who will be responsible for recommendations?</li> </ul> </li> <li>● Reports tailored to specific audiences <ul style="list-style-type: none"> <li>○ Reports are not used in communities. Posters, social media are more useful.</li> </ul> </li> <li>● Films/TV</li> <li>● Web-based information system that can be updated</li> <li>● Training materials</li> <li>● Google earth mapping – georeferenced information</li> </ul>
<p>2</p>	<ul style="list-style-type: none"> <li>● ACA vs ongoing assessment (independence of WG products)</li> <li>● Dynamic and responsive to the changes occurring, flexible</li> <li>● Ensure ACA products address questions politicians/policy makers need to make</li> <li>● Adaptation guide for various stakeholders</li> <li>● Arctic data and information at local level, and as an ongoing activity</li> <li>● Changing demographics challenge sustainability</li> <li>● Risk assessments</li> <li>● Map of available data – linked to meta databases – IPY Polar Data catalogue (?)</li> <li>● New ways of working together</li> <li>● Local data information centers</li> </ul>
<p>3</p>	<ul style="list-style-type: none"> <li>● There is a great demand for a multitude of products.</li> <li>● Broad agreement that many of the stakeholder issues begin with a single sector based assessment (building blocks).</li> <li>● In order for ACA and the integrated approach to be successful there had to be a foundation of sectoral and regional information already available</li> <li>● Once there is sufficient sectoral and regional information the coupling or integration into an integrated assessment would likely be more successful</li> <li>● in order to be successful ACA must serve as an umbrella by leveraging existing single sectoral and regional assessments and the most recent published relevant information</li> <li>● something that needs to be resolved is the issue of how the information is delivered to the stakeholders – how far does the ACA go in providing decision support services to stakeholders</li> <li>● a good example of a successful formula is ArcticNet and the use of IRISes.</li> </ul>
<p>4</p>	<ul style="list-style-type: none"> <li>● Guidelines on policies – how to operate in the future (that can be used by both business and government)</li> </ul>

	<ul style="list-style-type: none"> <li>● Guidelines for community engagement</li> <li>● Development of tools that can be applied to all stakeholders (i.e. local governments, groups, institutions)</li> <li>● Guidance for new technology developments to meet transitional needs with cumulative impacts of stressors</li> <li>● Set of reports – fact paper and recommendations</li> <li>● No “big bricks”</li> <li>● Products presented digitally</li> </ul>
5	<ul style="list-style-type: none"> <li>● Desirable characteristics of ACA products: <ul style="list-style-type: none"> <li>○ Short and easily accessible</li> <li>○ Timely – (issue of outdated assessments and information)</li> <li>○ Publicly available products and outcomes</li> <li>○ Include all relevant stakeholders</li> <li>○ Need to be rigorous, have quality control, based on best science/knowledge</li> <li>○ Should be explicit about linkages to other assessments</li> <li>○ Should include scenarios developed to appropriate scale</li> <li>○ Each product should have policy recommendations/implications that are developed in collaboration with stakeholders/users</li> </ul> </li> <li>● Need to keep global perspective in mind</li> <li>● Need to consider ecosystems services and need to link human health</li> <li>● same document will not be useful to all audiences – different need for information transfer</li> <li>● need for linking information produced by other – e.g. scientific work on fisheries, CAFF, ocean acidification, industry information</li> <li>● Need to have communication strategy from the very beginning</li> <li>● Need to build in monitoring system of whether we are effectively communicated. This opportunity enhanced by having <b>interim reports</b> – can adjust course</li> <li>● Need to decide on what interim products will be, how they will get used to final goal – need coherence from start</li> </ul>
6	<ul style="list-style-type: none"> <li>● Process is more important than product - so processes would be the legacy. A tool box that allows process to be repeated to create new policy statements.</li> <li>● Information on tipping points and thresholds</li> <li>● Policy relevant recommendations are most important <ul style="list-style-type: none"> <li>○ what kind of strategy needs to be put in place</li> <li>○ land use planning</li> </ul> </li> <li>● Targeted information for the appropriate audience... products should be developed that are usable by specific audiences/stakeholders</li> <li>● Use open access journals, publications are then more immediate</li> <li>● Projections on the possibilities or chances of change for important variables.</li> <li>● Information on surveillance, such as infectious diseases, rodents, pest infestations</li> <li>● Managerial modeling tool to investigate the consequences of change (such as SNAP)</li> </ul>
<p><b>4. Which factors ( ‘drivers’, ‘pressures’, impacts’, etc.) responsible for changing environmental and societal conditions in the Arctic should be included in an ACA when looking on different timescales (e.g. seasonal, annual, decadal, 2030, 2050, 2100 etc.) into the future?</b></p>	
1	<p>Option 1</p> <ul style="list-style-type: none"> <li>● Resource development</li> <li>● Economic development</li> <li>● Competition for the North Pole</li> </ul>

	<p>Option 2</p> <ul style="list-style-type: none"> <li>● Short-term drivers             <ul style="list-style-type: none"> <li>○ Industrialization</li> <li>○ Inflow of financial resources to the Arctic</li> </ul> </li> <li>● Long-term driver             <ul style="list-style-type: none"> <li>○ Impacts of climate change</li> </ul> </li> </ul> <p>Option 3</p> <ul style="list-style-type: none"> <li>● Social and Human Health Drivers             <ul style="list-style-type: none"> <li>○ Injuries related to climate change impacts</li> </ul> </li> <li>● Resource development impacts             <ul style="list-style-type: none"> <li>○ Demographics</li> <li>○ Stress on socio-economic infrastructure</li> </ul> </li> </ul> <p>Option 4</p> <ul style="list-style-type: none"> <li>● External drivers             <ul style="list-style-type: none"> <li>○ Global economy/need for resources</li> </ul> </li> <li>● External human driver             <ul style="list-style-type: none"> <li>○ People outside of Arctic (greed, need, curiosity and consciousness)</li> </ul> </li> <li>● Internal human driver             <ul style="list-style-type: none"> <li>○ People of the North</li> </ul> </li> </ul>
2	<ul style="list-style-type: none"> <li>● Connect change to drivers (help to prioritize); drivers can be positive and/or negative</li> <li>● Economic</li> <li>● Social</li> <li>● Environmental/ecosystem</li> <li>● Climate change</li> <li>● Changing Arctic demographics – social change/social capital, leadership</li> <li>● Political decisions needed</li> <li>● Growth of world population; the need for resources; commodity prices</li> <li>● Food security/health (physical and mental) wellbeing of people</li> <li>● Education needs to address change in Arctic (advantages and challenges)</li> <li>● Security – environmental / military / political (sovereignty)</li> </ul>
3	<ul style="list-style-type: none"> <li>● Climate change, contaminants, tourism, economic development (mining/oil/gas/tourism) commercial, /renewable vs non renewable resources: lets get specific. Energy (wide range), fisheries (commercial/subsistence), mining, living/non living resources, shipping/marine shipping, cultural and historical resources, access – national security, local vs global drivers, fire, invasive (consequence?) primary vs secondary drivers. Arctic contributions to sea level rise. Coastal erosion. Development of tech drives changes both ways. Depth of the concept – drivers/pressures/impacts/response. Drivers put pressure on the system that results on the state/effects and responses. Key ones seem to be climate change/variability, resources, contaminants, transportation (primary/secondary), global economics, population growth, demographics.</li> <li>● Significant semantic issues on what are drivers vs responses vs primary and secondary drivers in the system</li> <li>● Significant thought needs to be given to the different sectoral assessments</li> </ul>
4	<p>Helpful to categorize the drivers:</p> <ul style="list-style-type: none"> <li>● Root causal drivers (pattern the world is developing)</li> <li>● Drivers caused by root cause shifts – (i.e. biosphere shifts)</li> <li>● Cascadal drivers (drivers that cascade down causing other shift – like dominos)</li> </ul>

5	<p>Start with global drivers - climate change, pollution problems, energy, natural resources, tourists, transport situation - these are common to whole Arctic. Then also local drivers, local impacts, local opportunities. Then mosaic of local regions. Need to compare these.</p> <ul style="list-style-type: none"> <li>● Systems model – with permeable boundary. Things from outside – world prices of metals, arctic tourists - impinge on Arctic. Needs to be some discussion within ACA of these external drivers.</li> <li>● May need to be some sectoral breakdown within ACA.</li> </ul>
6	<ul style="list-style-type: none"> <li>● Demographics/migration</li> <li>● Natural Resources</li> <li>● Globalization</li> <li>● Climate Change</li> <li>● Time scales of consideration <ul style="list-style-type: none"> <li>○ Reliability decreases with further projections</li> <li>○ How do we define change?</li> <li>○ Need a long term vision to identify what we want to see to make strategic policy decisions to reach those endpoints.</li> </ul> </li> <li>● What are the main ecosystem services that the people of the communities of the arctic are receiving, how are they changing and how are they compensating</li> <li>● Lack of resources elsewhere is increasing interest in the Arctic</li> <li>● Increased economic activity will have increased impact on the environment</li> <li>● Local communities are not homogeneous</li> <li>● Variability along with changes on a range of time scales.</li> <li>● Toxics and Pollution – clearly a driver, both local and long-range. <ul style="list-style-type: none"> <li>○ Chemical impact, physiological impacts, can't look at all impacts, must choose.</li> <li>○ Impact on transport and fate of pollutants</li> <li>○ If we do have an increase in population, must have larger landfills, more cumulative effects.</li> </ul> </li> </ul>
<p><b>5. Which criteria could be applied to prioritize/narrow down the work?</b></p>	
1	<p>There is a need for a conceptual model to prioritize drivers</p> <ul style="list-style-type: none"> <li>● Regionalization <ul style="list-style-type: none"> <li>○ Drivers, stressors vary according to location; need to start with key regional environmental/social concerns</li> </ul> </li> <li>● Thresholds <ul style="list-style-type: none"> <li>○ What is the critical level of climate impact?</li> </ul> </li> <li>● Time scale of change <ul style="list-style-type: none"> <li>○ Select controls on each scale by 3-5 drivers</li> </ul> </li> <li>● Society Vulnerability <ul style="list-style-type: none"> <li>○ Short-term impact</li> <li>○ Significant impact (E.g., human health)</li> </ul> </li> <li>● Policy relevance <ul style="list-style-type: none"> <li>○ What is most likely to produce policy recommendations?</li> </ul> </li> </ul>
2	<ul style="list-style-type: none"> <li>● Prioritize the largest changes</li> <li>● Economic activity/development</li> <li>● Wellbeing of people – direct relevance to people</li> <li>● Health</li> <li>● Global impacts (sea-level rise)- what Arctic changes mean to society (local, regional and global) – information on change relevant to global decision making fora</li> <li>● Gaps in other relevant assessments</li> </ul>

	<ul style="list-style-type: none"> <li>• Ecosystem services</li> <li>• Balanced view through ACA process</li> </ul>
3	<ul style="list-style-type: none"> <li>• The proposed work needs to align with the statement of success of ACA</li> <li>• The proposed work needs to be achievable in a period time that will allow for effective decision making</li> <li>• The proposed work needs to be relevant to identified stakeholders and their needs.</li> <li>• Human and fiscal resources need to be identified up front that will allow for the successful deployment of the assessment and its delivery</li> <li>• Work should leverage existing AC working groups and associated products</li> </ul>
4	ACA should focus on and define stressors/drivers that we can influence
5	<ul style="list-style-type: none"> <li>• what other work is being carried out by other groups that is relevant (non-duplication)</li> <li>• what different users require (individual/family, communities, local government needs), regulatory bodies, etc</li> </ul>
6	<ul style="list-style-type: none"> <li>• Need to have human socio-economic issues high upon the agenda.</li> <li>• Need to look at how ecosystem services vary from location to location.</li> <li>• Need to look at biodiversity.</li> <li>• How can this be done on a regional scale, considering human, environment and socio-economic, health factors?</li> </ul>
<b>6. Which parts of an ACA should focus on the entire Arctic, and which should focus on specific sub-areas (geographical or thematic)?</b>	
1	<ul style="list-style-type: none"> <li>• Regional scenarios</li> <li>• Ecosystem zones <ul style="list-style-type: none"> <li>○ Xxx</li> <li>○ Xxx</li> <li>○ Xxx</li> </ul> </li> </ul>
2	<ul style="list-style-type: none"> <li>• Areas relevant for each driver</li> <li>• Some issues need regional assessments, i.e., migration for employment, detailed science baseline studies (local)</li> <li>• Ability to downscale from pan Arctic to community case studies</li> </ul>
3	<ul style="list-style-type: none"> <li>• There needs to be flexibility built into the process that allows studies to be conducted at the appropriate scales (local, regional, pan arctic)</li> <li>• Analysis of sectoral issues and related questions to be addressed will help determine the appropriate scales of study</li> <li>• In order for an integrated assessment to be successful the process needs to promote pan arctic studies that can serve as a foundation for more detailed and local, cross sectoral assessments</li> </ul>
4	<ul style="list-style-type: none"> <li>• Focus on regional and local scales</li> <li>• Focus on case studies from around the Arctic</li> </ul>
5	<ul style="list-style-type: none"> <li>• Regional downscaling is difficult – but being done for lots of processes – need better coverage of entire Arctic</li> <li>• One of most comment mistakes is study focusing on one scale – need to understand cross-scale effects. If take sub-regional scale, kinds of things you would include for above- and below would be different than for pan-optic approach. Critical to figure out what scale, and what are connections between that and others.</li> <li>• Different impacts depending on where you are (e.g. reindeer herding presentation by Sven M.) – how do we take regionalization and make it relevant for local areas&gt; Idea of developing climate change index (see also for Q3)</li> </ul>
6	<ul style="list-style-type: none"> <li>• There is a demand for regional scenarios.</li> </ul>

	<ul style="list-style-type: none"> <li>• There are models that are operating relatively well in some areas.</li> <li>• Question of resources vs. need.</li> <li>• If one wants to look at cumulative impacts, may start with mapping.</li> <li>• May focus on specific areas where rapid change is occurring, and on areas with multiple stressors</li> </ul>
<b>7. Any other questions to be addressed?</b>	
1	<p>Scientific</p> <ul style="list-style-type: none"> <li>• Standardization of terminology <ul style="list-style-type: none"> <li>○ “Adaptation and vulnerability” are not used in government management</li> </ul> </li> <li>• Address quality of modeling <ul style="list-style-type: none"> <li>○ Models that proved to be accurate for specific parameters should be used</li> <li>○ Develop scenarios based on likeliness, extreme situation scenarios</li> </ul> </li> <li>• Organizational <ul style="list-style-type: none"> <li>○ The concept and structure of ACA should be introduced early on through workshops, seminars etc. to show that the ACA can be used from the very beginning – regional cross-sectoral workshops to produce scenarios</li> <li>○ Local communities should be involved in technical products.</li> </ul> </li> <li>• Education and Communication <ul style="list-style-type: none"> <li>○ U of Arctic could be part of the process to make information available in short-term</li> <li>○ Bring young people on board (APECS, U of A, Google Earth, IPY experience)</li> <li>○ Ensure continuity of participation of Northerners in the assessment process</li> <li>○ Ensure policy makers and all stakeholders part of the process throughout (not just at beginning)</li> </ul> </li> </ul>
3	<ul style="list-style-type: none"> <li>• The process is the product</li> <li>• The ACA needs a sustained process in order to effectively address the above questions and effectively meet stakeholder needs.</li> <li>• Knowledge of all types needs to be infused into the ACA process</li> <li>• Many semantic issues need to be addressed over the course of the process</li> <li>• Communication, education and stakeholder engagement is needed for the success of any assessment yet they tend to be neglected in the early phases of assessment planning</li> <li>• Significant operational planning is a precursor to a successful assessment (funding, organizational construct, governance etc)</li> </ul>
4	<p>Timescales</p> <ul style="list-style-type: none"> <li>• The ACA can be based on a generational framing of time (i.e., 1 or 2 generations in the future – near time frame)</li> <li>• 2020, 2030, 2040, 2050</li> <li>• Focus on seasonal time scales – seasons are changing</li> </ul>
5	<ul style="list-style-type: none"> <li>• need for clear understanding of who intended audiences are in order to produce appropriate products</li> <li>• effective data management strategy needed, which involve dynamic process allowing for easy updates</li> <li>• adopt best practices from other assessment processes</li> </ul>

## **Annex 5**

### **Outcome of Breakout Session 2- Discussions**

Text from presentations is pasted into this Annex. Pictures are not included. The following questions were asked;

1. Of the key issues to be covered by an ACA, at which level (local, regional, circum-arctic or global levels) are they best analyzed or addressed?
2. In very broad terms, what is the state-of-knowledge regarding key issues to be covered in an ACA and what challenges are there in addressing critical gaps in knowledge? What recommendations might you have for follow-up work? Who might undertake the follow-up work?
3. Do you have specific recommendations for models for integrating data that may be applicable to the ACA process?
4. What can your organization contribute to the ACA process?
5. Any other questions to be addressed?

#### **Group No 1: Climate, hydrology/modelling**

Chair: Morten Olsen

Rapporteur: Ari Laaksonen

Göran Westerström, Kathrine Krogh Andersen, Eigil Kaas, Margareta Johansson Ari Laaksonen, Morten Olsen, Ralf Döscher, Harald Schyberg, Yrjö Viisanen, Olga Mokrotovarova, Genrikh Alexeev, Oleg Anisimov, Halldor Björnsson

#### Purpose:

To identify and analyze major primary and higher order drivers [impacts] of changes in the Arctic and their effects on living conditions in the Arctic in order to contribute to an informed basis for decision making at the Pan arctic, regional and local scale and inform the global society of major Arctic changes.

#### Process:

- Need to establish a matrix for primary and secondary drivers of changes and their impacts on key issues to be covered by ACA and qualified estimates of importance and scales (P, R, L)
- As for climate change the basis to do so is there (ACIA, SWIPA, IPCC AR5 and other studies), possible gaps need to be identified and regionalization need to be decided upon.
- Important that product are made available throughout the lifetime of the project.
- Portal for relevant information (studies etc) as the project develops.

Emphasis on:

- Regional and local scales
- Regional scale climate variability and change of variability
- Extreme events (particularly important at regional and local scale)
- Arctic-Global feedbacks
- Feedbacks between different drivers
- Relevant and timely products (information portal)
- Uncertainties need to be described

	Human health	Water and food security	Access	Migration	Culture and traditional lifestyles	Industrial development
Sea level rise	?	P/R/L	P/R/L	P/R/L	?	
Permafrost thawing	R/L	P/R/L	P/R/L	P/R/L	?	
Arctic sea ice melt	?	P/R/L	P/R/L		L	
Temperature	L	P/R/L		P/R/L	P	
Sea water acidification /salinity	?	P/R/L		?	P/R/L	
Precipitation	L	R/L	R/L		R/L	
Hydrology	R/L	R/L	R/L	?	?	
Arctic glacier melt	?	L	L	?	?	
Extreme events	L	R/L	R/L			
Sea water pollution	?	P/R/L		?		
Air pollution transport	P/R/L	P/R/L				
Ground water pollution	L	L		L		
Ozone loss	P/R/L	P/R/L				

- Other columns to be considered: Infrastructure, Tourism, Forestry, ETC.
- Experts should consider the magnitude and level of knowledge of the effects possibly in a similar table.
- Don't repeat what IPCC and others have done, make use of it

## **Group No 2- Climate/pollution**

Chair: Martin Fortier

Rapporteur: Cassie Bott

List of participants: Larry Hinzman, Per Døvre, Eric Schroff, Marianne Lillieskold, Anna Gran, Ingrid Berthinussen, Helgi Jensson, Jan Einar Reiersen, Cassie Bott, Martin Fortier, Mikala Klint, Cynthia de Wit

Question 1: Of the key issues to be covered by an ACA, as identified in Breakout Session 1, at which level (local, regional, circum-arctic or global levels) are they best analyzed or addressed?

- Climate change is major overarching driver
- Issues that go across all scales, from planetary to molecular!
  - Global & Regional Scale: Pathways (wind, rivers, ocean currents):
  - Regional Scales: Ecosystem changes, spills, tropic pathways, species shift...
  - Local Scales: Sources (re-emission, permafrost melt, glacier melt, ice melt, snowmelt, locally produced pollutants, oil spills, shipping, thawing permafrost, abandoned mines, health issues...)
- Continue addressing pollutants identified at the regional/local scale in a global perspective but more focus on regional impacts

Question 2: In very broad terms, what is the state-of-knowledge regarding key issues to be covered in an ACA and what challenges are there in addressing critical gaps in knowledge? What recommendations do you have for follow-up work?

- Likely the most documented issue in past and ongoing assessments.
  - (AMAP, ACIA, NCP...) – need to build on identified knowledge gaps in recent assessment and reports (POPS 2009, Arctic Pollution 2011...)
- Major efforts placed on ongoing trends monitoring (still essential), but lacking actual data and understanding on process studies, local ecosystem processes and biological pathways that influence these trends.
- Circumpolar inventories on monitoring of emissions (SAON could help)
- Focus on local sources/pathways of pollutants
  - Increasing in shipping in the Arctic
  - Oil spills with oil and gas development
  - Thawing permafrost where mines have been developed – local issue
  - Focus on current and future (shifts) in pollution at regional level
  - Huge gap in ecosystem modeling at the regional & local scale
  - Emerging issues (gaps):
  - Increase in emissions including new pollutants – i.e. black carbon, new POPs.
  - Ocean Acidification
  - Impact of ecosystem shift and biodiversity
- Need a user driven process to prioritize gaps
  - Change does not matter unless it is perceived to affect something
  - How are people affected at a local scale?
  - So what!!!

Question 3: Do you have specific recommendations for models for integrating data that may be applicable to the ACA process?

- Build on existing multidisciplinary data & metadata repositories recognized by various organizations (ex: Polar Data Catalogue (ArcticNet, NCP, IPY, CBMP, others))
- Continue to contribute to 5 thematic AMAP data centers
- Define & develop data integration tools
- Need to clearly define/validate various level of knowledge for ACA: Scientific, peer – reviewed, private sector, local, gray literature
- Need to go beyond data centers that are designed for researchers but are not the right tool for end all users and stakeholders (products).

Question 5: Integration aspects?

- Development of basic integration principles that can be used to build trust with local communities and stakeholders
  - Scientific rigor
  - Knowledge integration
  - Inclusivity and respect
- Establish integrated monitoring programme
- Difference between buy- in and ownership for stakeholders
- Avoid duplication of work and approaches that already exists in regional cooperation – i.e. Barent’s region secretariat, National indigenous organizations....

Question 6: Organizational structure

- Commitment/Letter of understanding with ACA participating organizations (MOU, letter of intent) –that clearly define the ACA principles and guidelines (ownership)
- Need a clear organizational structure that involves stakeholders in full process
- Inclusion of all residents of the North (including non-indigenous stakeholders) into the organizational structure.
- Should be clearly identified as an Arctic council project, not AMAP or working group project – but use the expertise of all working groups
- May need to find ways within the Arctic council structure to create an oversight council outside of working groups to ensure efficiency and avoid “turf wars” between working groups
- Will ACA use a consistent template or approach for all defined regional assessments?

Question 7: Purpose

- Integration across scales and disciplines and users
- General purpose of ACA is to make scientific and other sources of integrated knowledge more applicable to the general public, policymakers, industry, etc.

### **Group no. 3 Energy/oil and gas/shipping**

Chair: Anders Mosbech

Rapporteur: Tor Christian Sletner

From a group of Stakeholders in industrial development

#### Purpose

ACA should provide information and guidance to help decision makers to decide on future development in the Arctic to get a sustainable use of industrial opportunities

- taking care of local needs
- be social responsible
- use ecosystem-based management to sustain ecosystem services

Integration

Scaling

Industry participation and support

#### Integration / Process

Providing Tools

Facilitate development of Integrated management plans

Major change in thinking

New name

Continuous and including all working groups

More time to proposal...

#### 1) Level to analyze and address key issues

- Some Pan-Arctic but most cases regional level – not an either/or but both/and
- Issues dealt with at an Pan Arctic level can deliver tools and input for integrated assessment at regional and local levels
- Use existing bodies like IMO with SOLAS and MARPOL, and Integrated Management Plans (Norway) – reference to Barents 2020 and Polar Code, PAME, Management of areas important, Best practice identification – LME: Large Maritime Ecosystems, CBMP
- Operational decisions on regional level, strategic on Pan-Arctic
- Matrix; levels vertically and issues horizontally...economic, social etc

#### 2) Identify Critical gaps

- Report on updates on previous reports, papers and research
- Update and action needed on gaps identified in AC Oil and Gas assessment (2007)
- AMSA and Industry activities and other activities ongoing, general update/overview and status needed
- Oil in ice: oil spill prevention, oil spill response and clean-up and oil spill impact
- Standards for Arctic regions – ACA should deliver policy recommendations and follow ongoing work like Barents 2020

- Ecotoxicological research (e.g. research based adaptation of OSPAR guidelines for Arctic conditions e.g. discharge of drilling muds, discharge of produced water)
- Underwater noise (Cumulative impacts of seismic surveys on whales)
- Biodiversity baselines (coordinated in CBMP)
- Socioeconomic research lacking behind
- Search and Rescue – not only agreement but meat on the bones

3) Expectations from the group:

- Moving industry forward – development is proceeding
- Focus on possibilities and opportunities for industry as well as challenges and limitations

4) Integrated Management Plans:

- take onboard data from various sources wrt value of natural resources (polar bear?) – knowledge gaps trade off's.

**Group 4 Local and regional development – human health, indigenous peoples, etc.**

Chair: Jon Øyvind Odland

Rapporteur: Claudette Fortin

Gail Fondahl, Mikael Anzen, Inger Dahl-Petersen, Cindy Dickson, Birgitta Evengård, Colleen Healy, Anne Lager, Rachel McCormick, Arja Rautio, Tatjana Vlasova, Jody Butler

Improvement of human life in the Arctic in a changing climate and environment

- Arctic action

New working framework

- Communication internal
- Communication external
- Communication strategies
- Work together, not in parallel

Cultural Identity

- The Soviet case
- The Norwegian case

*“The challenge is not whether to grow but how to develop”* (Canadian Choices for Transitions to Sustainability, 1994)

What you do will determine the quality of the future...how will you respond?

Corporate Social Responsibility

- Industry development
- Mining
- Oil and gas
- Tourism

- Flow of money

Education and capacity building

- Ground school – residential
- High school – college
- University

Health and wellbeing in a climate perspective

- Specific or broad scale projects
- Injury prevention
- Mental health
- Life style diseases
- Food and water security
- Energy security
- Infectious diseases
- Contaminants
- Surveillance

Build on existing and ongoing programs

- AMAP HHAG
- SDWG HHEG
- Work at community level
- The ethical side
- Specific indigenous programs
- IPY 2012

*Thawing permafrost can have severe effects on infrastructure  
Some Arctic peoples are at threat!*

**Group 5 Local and Regional Development- economy/tourism/climate**

Chair: Bob Corell

Rapporteur: Janet Pawlak

Victoria Dobromyslo, Collen Henry, Taija Jurmu, Frigg Jorgensen, Ketil Hanssen, Lawrenc Hislop,

Purpose:

Reviewed yesterday, but the pattern is consistent among many of the Breakout Groups

Focus:

A use-driven agenda and analyses to underpin the assessment

A Next Epoch for Assessments:

- Initial Strategy (1980s and Early 1990s) -- A state of the science and knowledge, essentially a review paper.
- Recent Strategy (Late 1990s to 2011) -- An analysis of the state of knowledge, with an effort to communicate the findings to the policy and decision-making communities.
- The Next Epoch: A use-driven or user-driven strategy: Engaging the user communities continuously with feedback and engagement.

Guiding Framework:

- Framing is focused on the peoples of the Arctic, the resources of the region and its institutions, set in a global context
- Basic drivers are (a) Agriculture and food, (b) Energy and (c) clean water (others are important but these are the priority drives)
- Modulated by cultural settings, policy and regulations and human well-being.
- Implemented in a dynamic and continuously changing setting, with implementation methodologies that give priority to these dynamic conditions.

The Arctic, its peoples, resources, and institutions are set in the global arena. Globalization is the main change. In a global context, there are issues concerning how the rest of the world is affecting the Arctic as well as how what is happening in the Arctic affects the rest of the world. Thus, one scale of the approach should be global, highlighting the Arctic in the global arena.

- ACA Focus: The Arctic is set in the global arena and globalization is the main change.

Goals and objectives need to be set to be able to determine the status and trends using indicators. Indicators are needed on each level to understand the problems in individual areas, e.g., quality of life, health, transportation, electricity transmission, etc. There are already a number of indicators available, such as in the Arctic Human Development Report and others. Relevant indicators will need to be reviewed to determine whether they are fit for this work.

- ACA Focus: Goals and objectives need to be linked to indicators that are needed to measure status and trends.

ACA Focus:

- Rules and regulations for such activities as reindeer herding, business, tourism, and shipping need to be developed on a wide basis because regional requirements are not adequate.
- Assessment methodology is now building in more feedback mechanisms to ensure that there is greater clarification in information transfer. More effective tools for transfer and better feedback are needed.

An infrastructure needs to be developed to put out information on a more regular basis, including annual or continuous updates for certain types of information. A more dynamic means of communication needs to be developed. The new Russian 'Electronic memory in the Arctic' can contribute to this as well as a 'farm system' by which many activities occurring in different places feed into a central portal. The tourism sector can also serve as a communication vehicle to educate the tourists on Arctic Council policies and Arctic issues.

- ACA Focus: New vehicles of communication will need to be implemented and more frequent, and often more targeted, products should be prepared to disseminate information to stakeholders, policy makers, and communities.

What organizations can contribute towards the ACA Focus:

- The Lapland Chamber of Commerce has prepared a unique compilation of the types of businesses that are in the High North and the amounts invested there. This shows a great increase in investments in business, mining, tourism, etc., during recent years and indicates a need for a plan or strategy for such development.
- AECO has developed guidelines for tourism in the Arctic including specialized navigation equipment and environmental guidelines for cruise tourism.

The University of the Arctic provides an excellent possibility to communicate findings to young people and education is the best way to ensure good and sustainable development

### **Group No 6: Local and regional development (terrestrial ecology, reindeer/caribou)**

Chair: Grete Hovelsrud

Rapporteur: Martin Sommerkorn

Participants: Bridget Larocque, Lars-Åke Lindahl, Rick Myers, Monica Quinteiro, Svein Mathiesen, Brian Walker, Jesper Madson

#### ACA Purpose

- Provide adaptation and transformation options for managing change (maximizing benefits, minimizing risks), by
  - Focusing on social-ecological system:
  - Provide policy relevance across scales
  - focus on the drivers: critical drivers, drivers that can be influenced
  - integrate knowledge systems
  - learn from success stories and history
  - improve capacity to make integrative projections

#### Q1 At which level (scale) to address key issues?

- Issues are: Human health, water and food security, access, demographic change and migration, industrial development, biodiversity, social-ecological system services, cultural identity and well-being
- The group recognized the need for a multi-scale approach – the scales of the social-ecological system are all connected and integrated. This means that we cannot say that we will focus only on one scale. Have a FOCAL SCALE and integrate the links to other scales from and to there.
- System understanding and scale (“level”)
  - System and cross-scale interaction affect the dynamic of a complex social-ecological system
  - Necessitates approaching each topic across several scales

- => not looking at a region, but at a topic, there is not one scale we can look at, has to be integrated
- design an assessment of change through a range of models each of which captures one specific topic
- Level playing field for topics to be integrated
  - Cash subsidies vs market economies - assessment has to happen on a level playing field
  - Consultations needed between industries and local communities
  - what does development really do to people in the long term and how to deal with those impacts
  - industrialization changes people, they live in both worlds

## Q2, the state-of-knowledge

- Land use
  - Conflict over land use for now; strategic planning for the future
  - need for an approach that describes the coupled social-ecological system
  - need more forward-looking knowledge about connections between social system and physical-ecological systems.
  - Combining socio-economic and environmental/ecological scenarios to capture interlinked consequences. E.g. changes in climate, environment, human activities may cause changes in water and food security; encroachment of fences and roads, and perhaps industries, shift caribou migratory routes
  - Better understanding of the underlying basis for current use, through involving local communities (e.g. the mental models different groups operate on)
  - Two ways of governing: emerging as a way of capturing the way Sami reindeer herders relate to both their own indigenous system and the Norwegian nation state as an example. Need to capture and build on these complexities.
- Biodiversity and ecosystem services
  - Need to know what are critical habitats, critical biodiversity.
  - Need to know what planning is required, and based on what: scaling, instruments, causal relationships between biodiversity and drivers
  - Not enough knowledge on interactions – what is the shape of relationship between driver and effect, are there thresholds
  - Critical gaps in knowledge of what actually are the ecosystem services that link biodiversity to land and environment
  - Need an assessment of the ecosystems services that would enable a fair account of the environment for the social-ecological system.
  - Need to reconcile types of approaches in the way we view the environment. This is often shaped by culture – a biologist will view the notion of carrying capacity differently from a reindeer herder or a hunter. Perhaps we talk about a holistic (reindeer herding) versus a narrow focus (grazing land versus number of animals)?

- ITK and western science:
  - ongoing loss, and lack of written down forms of ITK a problem as it can help managing under changing conditions
  - Need to approach a topic from both perspectives: share and integrate relevant information between “the two ways of knowing”. ACA provides an opportunity for further efforts of integrating the two forms of knowledge
  - ACA investment to document, codify, publish ITK. Started in ACIA and have increased our knowledge significantly, but need a dedicated effort to succeed.

#### Integration

- needs from others:
- modeling, scenarios, projections: climate pollution, human health, tourism, fisheries
- Need for integration and coordination between groups:  
Planning of time line and integration points needed as e.g. scenarios could inform work of other groups early on in the process.
- there are models available (conceptual, etc.) to help integration , should be worked on as priority

#### **Group 7 Local and regional development – marine ecology/fishery/climate**

Chair: Tom Barry

Rapporteur: Harald Loeng

Participants: Tom Arnbom, Eddy Carmack, Reidar Hindrum, Kit Kovacs, Elling Lorentsen, Lisa Loseto, Frank Sonne, David Thomas

#### Conclusions

- Rename ARCTIC FUTURES - *remove the term assessment*
- Scenario development – updated annual/bi-annually
  - Based upon best available up-to-date integrated data
- Key audience politicians/stakeholders (including local)
- A pan-arctic scale – with regional applications
- Advisory panel (not a large unwieldy body)
- Principle Task – Identify and respond to key issues of concern in a timely fashion – aim to shorten response time
- Work housed in the Arctic Council Secretariat

## Annex 6

### Quotes received after the ACA Scoping Workshop

From Shipping Industry:

There are clear expectations that the industry will be moving forward in the Arctic and that the ACA in that respect will disclose possibilities and opportunities for international shipping

*Thor Chr. Sletner  
Norwegian Shipowners' Assosiation*

“Arctic change is inevitable but it’s paramount that indigenous “two ways of knowing” is integrated throughout the assessment”.

*Bridget, GCI*

“What would you like to leave your children? I want my child to have clear air, clean water, clean food and a peaceful planet”.

*Cindy, ACC*

Quote for Inclusion in ACA Proposal:

Arctic environments and societies continue to be affected by change and Inuit are not immune from these changes. Change is coming from many different sectors and on different scales. We know these changes are happening more rapidly than earlier predicted and realize there is need for an Arctic Council process to evaluate and act quickly on the most critical changes occurring in the Arctic.

Inuit support a change evaluation process that facilitates action and decision making in our communities. The process should help future decision making at all scales (local to global) by proactively delivering all types of knowledge (indigenous, local, industry, science) to inform and support decision making. We realize these changes represent both opportunities and risks. Obviously, the challenge is to find a way forward that’s balanced and provides for the needs of different stakeholders.

This evaluation process should: be quick and flexible; integrated (ecosystem based approach to management); involve all relevant stakeholders; whenever possible consider local and regional needs and concerns. The human dimension should be the overarching driver behind all decisions as we develop adaptation strategies to survive coming changes in the Arctic.

Inuit have concerns and questions with the Arctic Change Assessment at this time. We need to understand how it will be managed, funded and staffed before we can give our full support. Obviously, the Assessment must fit into the Arctic Council structure including the coordinated involvement of all working groups. The Inuit Circumpolar Council believes further proposal development needs to take place before the project is sanctioned by the Senior Arctic Officials.

*Jimmy Stotts, ICC Alaska, President*

## Annex 7

### Arctic Change Assessment (ACA) Proposal to SAOs

#### Preamble:

A changing climate coupled with forces associated with an increasing global human population, and its related demands, are leading to many changes in the Arctic. Associated with this is the desire of Arctic communities to modernize and take advantage of new opportunities that are arising.

The complex nature of these changes has led to new ways of thinking about how ‘assessments’ are conducted and how to make them more relevant to users, in particular policy-makers.

The proposed *Arctic Change Assessment* therefore promotes the integration, synthesis and assessment of the multiple factors that are related to ongoing and projected change in the Arctic in a clear and concise way that will enable and empower all forms of policy and decision-making that in turn will promote a more healthy, vital and resilient Arctic.

#### A new epoch for Arctic assessments

Initial Strategy (1980s) – A state of the science and knowledge.

Recent Strategy (1990s - 2011) – An analysis of the state of knowledge, with an effort to communicate the findings and influence policy and decision-making communities.

The New Epoch (2012- ) – A user-inspired, on-going process that addresses user needs. Engaging the user and stakeholder community continuously with feedback

#### Examples of important changes occurring in the Arctic

- Accelerated sea-ice loss leading to a seasonal ice-free Arctic Ocean;
- Increased opportunities for natural resource development, Arctic shipping and the rising potential for hazards;
- Increases in tourism and migration of new populations and cultures;
- The increased pressures on living and non-living resources and with it the dramatic rise in the risks related to contaminant, pollution and impacts on human health and well-being;
- Increased stresses on indigenous and local human populations and the pressures on protecting and sustaining subsistence, and natural and cultural heritage;
- Increased threats to the Arctic biodiversity, concurrent with increased presence of invasive species.

#### Purpose of this document

The proposals contained in this document have been developed to support SAOs in their “review [of] the need for an integrated assessment of multiple drivers of Arctic change as a tool for Indigenous Peoples, Arctic residents, governments and industry to prepare for the future ...”and to assist their efforts “to make recommendations for

*consideration by Arctic Council Deputy Ministers at their next meeting of a possible Arctic Change Assessment [ACA], including an Arctic Resilience report [ARR]" (Nuuk Declaration from the 7th Ministerial Meeting of the Arctic Council.)*

These proposals reflect the outcomes of the ACA scoping workshop which was held in Oslo, 28-30 September 2011. The scoping workshop was attended by 110 enthusiastic participants from all Arctic countries, permanent participants, local governments, Arctic Council Working Group representatives, observing countries and organizations, and representatives of a wide range of stakeholder groups (e.g., shipping, oil and gas, mining, tourism). Participants at the scoping workshop, including the representatives of the AC WGs recognized the value of the more innovative and integrated approach to assessments as represented in the ACA concept.

### **Relationship to ARR**

The ACA proposal contains reference to a parallel process to develop an Arctic Resilience Report; however, the ARR is the subject of a separate (coordinated) proposal.

Like the ACA, the ARR is envisaged as an integrative assessment process that will address cumulative impacts of multiple drivers of change. A distinguishing feature of the AAR is that it will focus on changes that have associated thresholds that, if crossed, may imply a permanent change of state or function for some component of the Arctic system. In this context, the ARR will form an important complementary contribution to the ACA process.

### **The need for an ACA**

Policy and decision-makers need to develop strategies to allow Arctic human populations and ecosystems to deal with changes, including both challenges and opportunities that these changes will bring. In this respect cross-sectoral cooperation in the region needs to be underpinned by information on the complex issues that drive change and determine impacts.

Northern residents and local governments have expressed a need for information that is relevant to their particular/individual and unique regional circumstances, which will allow them to adapt to changes, modernize and benefit from new opportunities, and at the same time retain their unique lifestyles and culture.

There are clear expectations that activities in the Arctic will expand in the coming years. This will require clearer guidelines and regulatory structures in order to maximize the benefits of and minimize the negative effects on Arctic peoples and ecosystems. Industry stakeholders have considerable potential to contribute to AC assessment processes, and have expressed a desire to do so.

### **Overarching Goal**

The goal of the ACA is to:

*Enable more informed, timely and responsive policy and decision-making related to a changing Arctic through a coordinated, regionalized and integrated assessment process.*

## **Guiding Principles**

*Inclusiveness and Ownership:* It is essential that all parties contributing to the ACA recognize their shared ownership for the process and its products, and also their responsibilities and commitments to constructively support the ACA process.

*Stakeholder Engagement:* ACA is conceived as a ‘user-inspired’ process aiming to address user needs. Arrangements should be made to ensure stakeholders are actively engaged in the process from the outset, with continuing consultation and feedback throughout the process.

*Transparency:* The ACA process should be ‘transparent’ in the sense that all parties, including parties external to the process can access and understand the way the ACA is being conducted and how its products are developed.

*Reliability:* The ACA process should ensure that science-based and other information used as a basis for ACA products are subject to appropriately rigorous quality assurance and/or acceptable documentation procedures.

*Relevance:* A key concept in the ACA process is that its results will be relevant to meet defined needs of both policy and decision-makers, and will be made accessible in the form of product(s) appropriate to the requirements of these respective groups.

*Flexibility:* The ACA process should be flexible so as to allow the timely delivery of relevant information to policy and decision-makers.

## **General Components of ACA Implementation**

*Scales/Regionalisation:* ACA activities and products should cross a spectrum of spatial and temporal scales. They should reflect the desire to provide information relevant at a regional (and potentially local) level, at scales appropriate to decision-making processes and relevant to stakeholder (in particular northern residents) interests.

*Scenarios:* ACA should be based on a common set of scenarios that are agreed on at the outset of the process. The scenarios currently being developed to serve the 5th IPCC assessment will form an important initial contribution to the ACA in this respect. Additional scenarios could include social-economic development plans, energy forecasts, global markets, demographics and migration, etc.

*Sustainability of Process:* The identified needs that justify the establishment of the ACA will likely exist beyond 2017, so it would be worthwhile to develop the ACA as a ‘process’ to support integrative policy- and decision-making with a longer term perspective than 2017. The structures established to deliver the ACA will be more cost efficient if maintained for longer term use.

*Common understanding of terminology:* It is important that there is a common understanding of a number of terms that are likely to be used in describing the ACA process.

## **Priority Areas**

The workshop identified a number of key topics including human health and well-being, food and water security, access, migration, culture, ecosystem health, and resource development that are important to be included in ACA priority considerations. Further discussions through stakeholder workshops are needed to prioritize areas for future ACA activities.

It also recommended a focus on drivers where policy can exert an influence, recognizing there is also a need for information on factors such as global economic demand and climate change that are the main underlying drivers of change in the Arctic.

## **Communication and Outreach**

A key aspect of ACA is the need for multi-path communications between stakeholders, northern residents, Arctic science community, industry and the Arctic Council.

Therefore an ACA communication and outreach plan will be developed as an integral and early part of the process and in accordance with the overarching Arctic Council communication and outreach strategy.

## **Deliverables and Timeframe**

It is envisaged that the ACA will result in a range of different products targeting specific stakeholder needs and be produced with active involvement of key stakeholders. For illustrative purposes only, these could include scenarios and an analysis of their implications; regional integrated assessment reports; short policy papers with recommendations; guidelines; data products; posters, films, audio broadcasts and brochures; websites; programmes to fill data gaps.

Products should be produced in a timely manner to be responsive to the needs of decision-makers and other users. Thus the process should envisage interim ACA products during the period until 2017, in addition to products of thematic assessment activities that will contribute to ACA.

## **Resource Considerations and Added Value**

The ACA would provide considerable added-value to existing and planned Arctic Council activities. There will be identified gaps that will need to be filled in order to be able to deliver an ACA.

It is anticipated that an ACA will require new resources, including funding for a number of workshops and outreach initiatives. A large part of this requirement can be met through in-kind support from on-going national processes and contributions from involved stakeholders. At this early stage of development it is difficult to estimate, however, the amount of new resources needed. This will be further defined at future workshops.

Norway and Canada have kindly allocated funding that has supported the ACA planning activities to date, including work by the AMAP Secretariat to arrange the ACA scoping workshop and the support development of an ACA proposal.

## **Organizational Framework**

Based on discussions during the stakeholder and scoping workshop in Oslo, a number of organizational framework models could be considered for the ACA. The ACA management structures will also need to take into account regionalization perspectives.

The management structure will be critical to the implementation of the ACA and this issue requires more thorough consideration. It is therefore proposed that a 'Project Implementation Team' be established and requested to continue the development of this part of the ACA proposal.

Whatever the management structure, it should be recognized that the ACA is an Arctic Council driven initiative.

### **Next Steps**

- 1) Seek SAOs approval of this proposal to continue the planning phase of an ACA.
- 2) If the ACA is approved by SAOs, the SAO Chair might create/designate an ACA Project Implementation Team to further develop the ACA proposal prior to its submission to the Arctic Council Deputy Ministers meeting to be held spring 2012. The initial issues that the ACA Project Implementation Team might address are as follows:
  - ACA management structure;
  - Regionalization aspects;
  - Scenario development;
  - Specific priority setting;
  - An initial work-plan.