



# EXTERNAL REVIEW OF THE ARCTIC MONITORING AND ASSESSMENT PROGRAMME STRATEGY

*MARCH 2010*

## **Citation:**

Carlson, D., J. Parker, G.-B. Retter, D. Stanners and D. Stone, 2010. External Review of the Arctic Monitoring and Assessment Programme Strategy. AMAP Report 2010:7.

ISBN 13 978-82-7971-060-8

Arctic Monitoring and Assessment Programme (AMAP), P.O. Box 8100 Dep., N-0032 Oslo, Norway ([www.amap.no](http://www.amap.no))

## **EXTERNAL REVIEW PANEL**

David Carlson, International Programme Office, International Polar Year;

James Parker, Shell International E&P and International Association of Oil and Gas Producers;

Gunn-Britt Retter, Saami Council;

David Stanners, European Environment Agency;

David Stone, Retired Public Servant, Canada.

**Distributed for the external review panel by:** Arctic Monitoring and Assessment Programme

## **Acknowledgements**

The external review panel wishes to thank:

Nikolaj Bock (European Environment Agency) for his valuable contributions to the work;

the AMAP Secretariat for providing excellent logistical support; and

Arctic Council Indigenous Peoples' Secretariat for facilitating the dialogue with Russian-speaking correspondents.

## **Disclaimer:**

Each panel member contributed information and ideas to this report as an individual, not as a representative of his or her institution or organization or of any third party. The conclusions and recommendations presented here derive solely from the panel members themselves.



# EXTERNAL REVIEW OF THE ARCTIC MONITORING AND ASSESSMENT PROGRAMME STRATEGY

MARCH 2010

## CONTENT

PREFACE

1. INTRODUCTION

2. PURPOSE AND OBJECTIVES OF THE  
EXTERNAL REVIEW

3. INFORMATION GATHERING AND ANALYSIS

3.1. Limitations and Qualifications

4. THE IMPACTS OF AMAP ACTIVITIES &  
PRODUCTS

5. CURRENT PROCESSES AND PRODUCTS

6. CHALLENGES FOR NEXT DECADE

6.1. The Arctic

6.2. Collaboration

6.3. Data and Information

6.4. Communication

7. QUESTIONS FOR AMAP, ITS PARTNERS, AND  
ITS SPONSORS

7.1. Have the processes and products of AMAP met the  
information requirements and policy aims of the Arctic  
Council?

7.2. Should AMAP change the way it does assessments?

7.3. How can AMAP best meet the multiple needs of many  
stakeholders?

7.4. How can AMAP influence and ensure the availability  
of timely, sufficient and appropriate data for its future  
assessment activities?

7.5. How should AMAP 'publish' its products?

7.6. How should AMAP interact and communicate with Arctic  
residents?

8. CONCLUDING REMARKS





## PREFACE

An external panel was convened to conduct a review of the work and products of the Arctic Monitoring and Assessment Programme (AMAP). Our review focused on the outputs of AMAP in the context of peoples, institutions, organizations, and industries that have a need for Arctic environmental and health monitoring information (stakeholders). The panel targeted three issues: the past and current utility of AMAP products, possible gaps in stakeholder awareness of AMAP, and how AMAP should address challenges in the coming decade. We found that AMAP products were widely known and respected in Arctic governments, in intergovernmental, scientific

and education organizations, and by indigenous people's organizations; for a wide variety of stakeholders, AMAP has concentrated on the important and relevant environmental issues for the Arctic region. We identified the following areas as the most common and persuasive suggestions for improvement: attention to data access and data sharing issues; increasing the timeliness, impact and perhaps regularity of the AMAP assessments; better integration of AMAP activities in the context of climate and with, for example, related ecosystem or biodiversity assessments; and a general increase in AMAP's profile through more effective outreach.



## 1. INTRODUCTION

The Arctic Monitoring and Assessment Programme (AMAP), established in 1991 under the Arctic Environmental Protection Strategy and later (1996) subsumed into the Arctic Council, has the objective to understand and document Arctic environmental change in order “that monitoring results may be used to anticipate adverse biological, chemical, and physical changes to the ecosystem and to prevent, minimize and mitigate adverse effects”. To meet this objective, AMAP produces scientific assessments and provides regular reports on its findings to the Arctic Council. A description of the current AMAP program exists at <http://www.amap.no/>; that site also contains a full listing of all scientific and popular reports discussed in this review.

## 2. PURPOSE AND OBJECTIVES OF THE EXTERNAL REVIEW

The AMAP work plan for 2009-2011, adopted by Arctic Council ministers in April 2009, called for a review of the AMAP Trends and Effects Programme and for AMAP to develop plans for the next ten years. The only other review of AMAP, by the International Arctic Science Committee (IASC), occurred in 1992.

The AMAP Working Group structured the present review into an internal review, conducted by experts who contribute to AMAP reports, that examined scientific and organizational matters, and a separate independent external review to consider the products of AMAP in the context of peoples, institutions, organizations, and industries that have a need for Arctic environmental and health monitoring information (stakeholders). This report constitutes the external review, which aimed to:

- Evaluate the extent to which AMAP activities, as defined in its existing framework strategy and assessment strategy documents, can meet the overall mandate for AMAP, as established by the Arctic Council, and address the future environmental protection challenges that will result from anticipated changes in the Arctic in coming years;

- Evaluate the outreach/communication strategy used by AMAP; and,
- Provide suggestions for improvements to the AMAP framework strategy and assessment strategy that will enable it to better meet its mandate.

The Terms of Reference for the external review also contained eight detailed “assessment and output questions”. Recognizing the limitations of time and resources for conducting this review, and appreciating the time urgencies of the review, the external review panel determined to focus its efforts on the three objectives above, while keeping additional questions in mind as we interacted with stakeholders.

## 3. INFORMATION GATHERING AND ANALYSIS

Each member of the external review panel conducted a wide consultation of stakeholders in our areas of familiarity covering: 1) Indigenous peoples; women; youth; and education; 2) Governments and international inter-governmental organizations and scientific organizations concerned with addressing pollution, human health, climate, and other environmental changes; and 3) Northern industry and commerce, including oil and gas sector organizations, tourism, shipping and mining representative organizations.

The members of this panel consulted approximately 70 entities through phone and letter surveys. The panel members operated from a core set of questions, with slight modifications as necessary for specific groups. Views were solicited on the utility of AMAP products, on possible gaps in stakeholder awareness of AMAP, and on how AMAP should address challenges in the coming decade. In several cases an appropriate preserve of confidentiality of the interviewee and of their comments was considered necessary. For this reason a blanket of confidentiality over all stakeholder identities and comments has been applied. Notwithstanding this confidentiality, the external panel can attest that many leading and prominent representatives of each group

were consulted, that our surveys elicited a high response rate, and that all respondents offered genuine and thoughtful information.

The entire review was conducted within a time period of only three months. The compilation of individual surveys resulted in a systematic set of useful information and comments, but necessary differences in the approaches taken with each stakeholder group precluded standardized reporting or statistical summaries. In reviewing the survey results, the panel has made a conscientious effort to capture salient and pervasive points raised by the stakeholders, related to the three objectives of the review, while also developing a general sense of individual experiences and concerns. Although each panel member 'knew' AMAP in one way or another beforehand, each panel member also recognized that he or she each achieved a much better understanding of AMAP's reputation and impacts through the external review process. Collectively, the external review panel can attest that through these information-gathering and consultation processes, a unique combination of information and perspectives were acquired. As a result, it has been possible to produce a well-informed report.

The panel presents its findings and recommendations in the following sequence: Impacts and Accomplishments; Current Practices; Challenges for the next Decade; and Questions to Consider. Rather than reacting to specific change scenarios, this report has focused on AMAP's roles in a broadly changing Arctic. Because of the cross-cutting nature of many Arctic issues, and due to the fact that these issues in many cases go beyond the original mandate of AMAP, the panel chose to conclude its report with a set of questions rather than with recommendations specific to AMAP. In most cases, answers to the questions posed in Section 7 will point to necessary actions.

### **3.1. Limitations and Qualifications**

The members of the external review panel reflected a broad scope of the peoples, organizations, and society that require Arctic environmental and human health monitoring. For the purposes of this review, we agreed to function as subject and area experts, not as representatives or advocates for the organizations, institutions or groups

to which panel members belong. Throughout the review the external review panel has acted independently of AMAP. AMAP played no role in the selection of correspondents, in the compilation and assessment of the information, or in any aspect, general or specific, of the contents of this report. At the same time, readers should recognize that AMAP selected the panel members, at least in part, due to their interests in the program and in their willingness to serve. The panel included a member who had chaired AMAP 14 years ago, selected to provide insight into the structural foundations of AMAP. The panel relied on the AMAP secretariat for relevant documentation and for conveying the findings and recommendations to the Arctic Council. In its surveys and consultations, the panel deliberately selected correspondents who would, or should, know AMAP's practices and products, and in requesting their input we in effect notified them of our intentions in advance. Within these necessary constraints, the panel believes that the report produced is informed and independent.

This panel recognized when conducting its review that AMAP has operated from the beginning, in the early 1990s, under starting conditions and assumptions that cannot now be changed. The original focus of AMAP was on individual pollutant types such as persistent organic pollutants (POPs), heavy metals, hydrocarbons, acidification, and radioactivity. However, the panel also recognized that environmental and human development needs of the Arctic are now more complex, requiring multi-organizational (within and outside of the Arctic Council) attention. The Arctic Council now formulates its work plans and those of its working groups as themes to be addressed by collaboration among working groups and organizations. The panel acknowledges the desirability of this collaborative approach. Consequently, in this review, past AMAP activities were evaluated according to the conditions extant at that time, while up-coming issues were explored under a changed (and changing) set of assumptions. It is difficult, perhaps impossible, to advise AMAP about the future needs of stakeholders without considering this broader context. For that reason, both AMAP and the Arctic Council are considered as "clients" for this review.



## 4. THE IMPACTS OF AMAP ACTIVITIES & PRODUCTS

This panel found that AMAP products were widely known and respected in Arctic governments, in intergovernmental, scientific and education organizations, and by indigenous peoples' organizations. Not surprisingly, groups as well as individual stakeholders knew some AMAP products better than others, and some stakeholders recognized a product such as the Arctic Climate Impacts Assessment (ACIA) without recognizing its source. Nevertheless it was clear that, for a wide variety of 'users', AMAP has since 1991 focused on the important and relevant environmental issues for the Arctic region, and has provided through its products a high level of documentation and understanding.

This panel can report abundant evidence that AMAP products had influenced:

- 1) Community, regional, national and international policy development;
- 2) Creation and maintenance of international control instruments on contaminants such as the Stockholm Convention on Persistent Organic Pollutants (POPs), the Protocols on POPs and Heavy Metals under the Convention on Long Range Transboundary Air Pollution (LRTAP), and the 2009 decision of the Governing Council to the United Nations Environment Programme (UNEP) to develop a control instrument on mercury;
- 3) The identification of pollution "hotspots" for remediation actions by appropriate organizations (e.g. under the Arctic Contaminants Action Programme (ACAP));
- 4) Arctic residents and Arctic communities;
- 5) The directions, agendas and successes of major Arctic research programmes;
- 6) Oil and gas companies with Arctic interests through timely issue of the Oil and Gas Assessment 2007 (Executive Summary); and
- 7) Global attention to Arctic climate change and its consequences.

In particular, this panel recognized the very strong impact of the ACIA, produced through cooperation between AMAP, the Arctic Council

Working Group on Conservation of Arctic Flora and Fauna (CAFF) and IASC, in:

- Defining and promoting a fresh Arctic agenda;
- Contributing to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC);
- Increasing awareness in governments and residents of the dimensions and implications of Arctic climate change; and,
- Guiding international and national research agendas, and providing stimulus and motivation for the International Polar Year 2007-2008.

Several characteristics of the AMAP process were identified that contribute to widespread recognition of and respect for its products. These include:

- 1) A consistent history of focusing on issues relevant to Arctic residents;
- 2) Actively involving Arctic residents in elements of AMAP assessments;
- 3) Addressing issues comprehensively, using assessment teams drawn from within and outside of Arctic countries;
- 4) Ensuring that all included and referenced data and reports meet the highest standards of technical quality and reliability based on documented quality assurance and control protocols, laboratory inter-comparison practices, and peer review;
- 5) Publishing its products in forms and formats relevant for a wide spectrum of stakeholders; and
- 6) Maintaining operational flexibility as a mechanism to undertake and complete multi-partner projects.

Within an overall positive view of AMAP, stakeholders did identify some limitations concerning the AMAP processes and the uses made of AMAP products:

- 1) Genuine involvement of indigenous peoples' organisations and Arctic residents in the AMAP processes has often not achieved uniform geographic participation nor has it become a 'default' mode of operation. In particular, in some regions, involvement of

Arctic residents in AMAP processes may have declined since the ACIA.

- 2) AMAP findings do not penetrate down to the community level in all regions due primarily to financial considerations including translation costs.
- 3) Some large organizations that reported a high general awareness of the work of AMAP also reported institutional pockets where awareness was weak.
- 4) Some stakeholders feel that AMAP findings have not had desired impacts on national policy in some Arctic countries. In some cases, non-Arctic countries have been more active in bringing AMAP information on pollutants to the LRTAP or Stockholm Convention bodies concerned with evaluating proposals to add new substances to these agreements.
- 5) A relatively low level of awareness of AMAP products was identified among Arctic industries and commerce (with the important exception of the oil and gas sector).

Some of these concerns have more to do with organizational communications and national policies than with the quality of AMAP processes and products. The general issues of awareness and impact of AMAP products, particularly for Arctic residents, are addressed below.

## 5. CURRENT PROCESSES AND PRODUCTS

At the time of this evaluation AMAP had, as expected, several assessments underway, at various stages of completion. The panel considered the three components of the Snow, Water, Ice and Permafrost in the Arctic (SWIPA) assessment as good examples of the types of processes and assessment challenges to be expected for AMAP in the future. Many of the panel's correspondents knew of these and other current activities.

Many stakeholders feel interested in, and pleased with, these current AMAP activities and expressed an overall confidence in AMAP as the preferred group to lead and manage these activities. However, in part due to this community confidence and the growing workload it portends, limitations of AMAP were identified in the areas

of community involvement, delivery times, and 'assessment overload'.

As awareness of Arctic change and pollution increases (at least in part as a consequence of past AMAP activities), many organizations begin to produce their own reports and assessments. Often these organizations desire and assume collaboration with AMAP. This convergence of attention generally results in the same relatively small pool of experts being solicited for multiple overlapping studies. The current attention to short-lived climate forcers by several separate groups, each hoping to produce a prompt and high-quality assessment, demonstrates the acute problem: without coordination, global and regional demand for expertise outstrips the community available or, more seriously, exceeds the community willingness to participate. At the same time, as Arctic assessments increasingly require integration of "western science" and traditional knowledge, the vision of Arctic peoples fully participating, through AMAP, to develop Arctic solutions to Arctic issues remains, at best, only partially realized, at least in part due to inadequate funding.

The increasing demand for policy relevant information on a rapidly changing Arctic environment is difficult to reconcile with the typical time (three to four years) required to produce AMAP scientific assessments. Too often, AMAP reports have not met their intended delivery schedules. Products that do achieve quick release and timely impact (e.g. SWIPA Greenland) require extraordinary (we would submit, unsustainable) effort on behalf of AMAP. We identify several reasons for delay, notably unanticipated barriers to availability or delivery of key data and the time required for multiple layers of political evaluation and approval within national programs and the Arctic Council. When, for whatever reason, AMAP products miss optimal windows for impact, these delays lead to serious difficulties for stakeholders. For example, delays in approval and release of a technically complete AMAP assessment can hinder processes for adding substances to or evaluating effectiveness of the Stockholm Convention and LRTAP POPs Protocol. Of equal concern, in an Arctic environment where properties such as annual minimum extent of sea ice can change by 40%

from year to year, the products of four-year assessments, by AMAP or any other group, seem potentially irrelevant by or before the date of release.

As mentioned, AMAP processes and products emerge within an increasing number, range and quality of Arctic assessments. We already described several groups planning independent assessments of the impacts of so-called short-lived climate forcers in the Arctic. We note in addition annual Arctic report cards (on-line and in print), multiple Arctic products, often produced in relatively high quality on relatively short time scales, by respected non-governmental organizations, and numerous and often unexpected products (reports, white papers, green papers, etc.) produced by multilateral and UN organizations and by Arctic 'Ambassadors'. We note that many AMAP contributors also contribute, independently and voluntarily, to urgent a-periodic assessments (the Copenhagen Diagnosis, for example) and that the entire AMAP process co-exists within and cooperates with global assessments on climate, biodiversity, energy and health. We further note, from the view of an analog or digital 'inbox', that even as the number of assessments increase, evidence (if any) of connection, coordination, convergence and consistency recedes. Even accepting, as we do, that AMAP produces quality products of high value, this panel believes that the AMAP community needs to ask whether its products receive the necessary attention and have the desired impact amidst a general situation of assessment overload.

## 6. CHALLENGES FOR NEXT DECADE

### 6.1. The Arctic

All the groups with whom we are familiar, residents, monitoring agencies and policymakers, commercial enterprises, and researchers, face enormous challenges in the Arctic of the future. If in the longer term (multi-decade) serious and fundamental decreases and losses of snow and ice in all their forms seem increasingly likely, the coming decade presents unprecedented forecasting, operations, monitoring and assessment challenges.

For the purposes of this review, we assume a decade of rapid, large amplitude change. We firmly expect that atmospheric, oceanic, coastal and terrestrial geophysical and ecological processes that govern the transport and accumulation of contaminants, and the social and economic factors that determine human exposure, will change in intensity, frequency, and time of occurrence. Abundant evidence indicates, moreover, that the details of these processes will become less predictable for perhaps a decade or more, and that the integrated Arctic geophysical, ecological and social system will not have reached a new mean or steady state or even a clear trajectory within the next decade.

We submit that AMAP's role in the coming decade becomes more valuable and more urgent, even as it becomes more difficult. In view of likely changes in processes, trends and source materials, assessments of the efficacy of various conventions and protocols will become more urgent and update requests may become more frequent. We recognize that AMAP has no choice but to incorporate climate change as a primary factor and feature of its monitoring and assessment program. At the same time, we foresee an increasing pressure to focus assessment work regionally, on development and local contaminant issues.

### 6.2. Collaboration

ACIA is seen as one example of the high quality and wide impact of AMAP products. Unfortunately, the core strength of that product, that it resulted from a uniquely broad and inclusive process, meant that it took an extraordinarily long time to complete: most of a decade, by some accounts, from idea to final product. As widespread collaboration becomes more essential in the coming decade, we predict that AMAP will need new models for timely and integrated cross-sector assessments involving many partners. It may need to parse assessments into separate components, completed on independent time schedules, as in SWIPA. The production of synthesized and comprehensive assessments will require innovative organizational methods to involve groups and agencies within and external to the Arctic Council. AMAP will need to maintain its focus on issues with high relevance for the Arctic



and for Arctic residents while at the same time embedding its work firmly in hemispheric and global issues and assessment products. It will need to maintain and support its expert teams and to invigorate its processes and products with younger recruits. Heightened collaboration, with traditional and new contributors, partners, sponsors and stakeholders, will draw on AMAP's existing strengths while also presenting new challenges.

### 6.3. Data and Information

To meet the challenges of the coming decade, AMAP will need to draw on new and enhanced data and information sources. IPY will produce, over the decade, a surge of additional publications, often containing fresh information on contaminant exposures and impacts in ecosystems and communities; many of these reports will appear outside of the familiar environmental contaminants literature. Because most IPY projects received IPY-labelled national support, many of these IPY publications may become evident and available through national tracking processes.

The on-going issue of sparse data availability in some large regions and for some themes and sectors will continue to impede AMAP's assessments and impose limitations on their quality and applicability. AMAP's role in the Arctic-wide Sustaining Arctic Observing Networks (SAON) initiative should, as SAON evolves, focus on sustaining the various monitoring networks and on rapid and widespread data availability. AMAP, for itself and on behalf of its many partners, should develop an awareness and possible influence on the Polar Information Commons activity which, if it succeeds and grows, may offer substantial new options for identifying, sharing and accessing polar information.

Community monitoring networks and the hydrocarbon industry are expected to become increasingly active over the coming decade as additional potential sources of Arctic information. Community monitoring activities, stimulated and supported in part by IPY, now operate over a substantial part of North America and Eurasia. They monitor, among other topics and targets, birds, mammals (terrestrial and marine), fish (freshwater and marine), plants

and forage, and lake and river ice. They often directly examine and report condition and health of animals; during IPY they increasingly collected samples for later disease, contaminant and genetic analysis. Most of these community networks will continue their activities for at least a decade. Over the same time period we expect that the Arctic hydrocarbon industry will and should become an increasingly utilized source of data, expertise, and advice, as well as a partner in both studies and assessments. A future AMAP product that incorporates data from both of these sources will represent a remarkable achievement in information sharing and in partnership.

### 6.4. Communication

Amidst all of the decadal challenges outlined in this section, and even if AMAP merely continued its current level of excellent services, there will be an over-riding need for improved communication. At present, AMAP outreach and communication occurs mostly through and associated with its specific products, largely through a mixture of product-specific, sponsor-generated, or nationally coordinated plans and mechanisms. As a result, as many stakeholders attest, AMAP often fails to receive appropriate credit for its products and generally fails to develop long-term respect and reputation proportional to its cumulative record of quality and impact. This panel welcomes the development of a directed and deliberate education and outreach plan as part of the AMAP Strategic Plan. The panel foresees a need for increasing activities in communication with Arctic communities, in the fields of formal and informal education, and in conveying Arctic urgencies, each discussed briefly below. An enhanced AMAP communication program should resonate with and serve well the Arctic Council. Enhanced communications will require but also highlight and benefit the extensive partnerships and collaborations expected above.

**Communities:** An increasing need is foreseen for informed discussion among AMAP, its partners, and Arctic communities during the initiation of AMAP projects, during implementation, and as a condition of successful completion. Arctic residents and their regional and pan-Arctic organizations represent an

essential partner in these communication activities. Communication activities and practices stimulated by IPY and the regular production of clear fact sheets in many local languages may represent useful examples. Most of the community monitoring activities listed above use networks, web sites and newsletters to communicate among partners across many communities – they also represent useful and ongoing communication mechanisms.

**Education:** This panel foresees an increasing need for better linkages between AMAP activities and products and Arctic educational institutions, with the University of the Arctic as a primary and obvious partner. Teacher networks stimulated by IPY, within but also crossing between North America and Europe, provide models for Arctic to Arctic and Arctic to world educational exchanges.

**Arctic Urgencies:** As AMAP with its various partners updates its plans and promotes new activities, this panel anticipates an increasing need to convey from the Arctic to the rest of the world compelling messages of continuing Arctic urgency. Along with changes in ice and snow and in marine and terrestrial ecosystems, these messages should also convey concern about issues vital to Arctic peoples, such as basic community health needs and access to clean drinking water. This panel expects that the coming decade will see increasing ‘news’ from the Arctic, raising the opportunity and challenge for AMAP to promote its role as the group monitoring and speaking for the overall health of the Arctic.

## 7. QUESTIONS FOR AMAP, ITS PARTNERS, AND ITS SPONSORS

Based on very clear messages of relevance and impact from virtually all stakeholders (Section 4), and on our assessments of current operations (Section 5) and of challenges for the coming decade (Section 6), the panel presents below a set of annotated questions, all entirely relevant to AMAP but addressed to a larger community that includes AMAP, the Arctic Council, and various other partners and sponsors. We confidently expect AMAP and

the AMAP Working Group to develop specific plans and solutions, provided they receive clear direction and priorities from the Arctic Council. Here we focus respectful but occasionally provocative questions around the single issue that pervades our consultations and evaluation: how to prevent erosion of the positive legacy of AMAP strengths while at the same time positioning AMAP to meet the challenges of the coming decade? Certainly enhanced resources, periodically and perennially, represent a major part of the answer to that question, but we also perceive a need for thoughtful discussion of overall goals and policies, which we hope these questions stimulate.

### 7.1. Have the processes and products of AMAP met the information requirements and policy aims of the Arctic Council?

Our assessment demonstrates a clear message of impact and relevance for AMAP to individual stakeholders. But, what value does the Arctic Council perceive? For the Council, a clear answer to this question will help it recognize, refine and direct the activities of each and all of its working groups. For AMAP, a clear answer will provide direction and motivation to address upcoming issues and challenges on behalf of the Arctic Council.

### 7.2. Should AMAP change the way it does assessments?

Should AMAP replace topic specific assessments (e.g., POPs) with cross-sector themes that would address broader impacts and interests in, for example contaminant trends? Should AMAP support parallel but separate activities in information gathering (i.e., monitoring) and assessment production? Should AMAP, with partners, develop a ‘triage’ approach to identify and respond to the most urgent needs and to most effectively coordinate and produce future integrated assessments?

### 7.3. How can AMAP best meet the multiple needs of many stakeholders?

Could AMAP, working with all relevant AMAP stakeholders and with other Arctic Council working groups as partners, produce a map of

assessment needs and activities over a 3 to 5 year period, with reference to relevant external (global) requirements and assessments? Within this map, and allowing for out-of-cycle requests and contingencies, could AMAP then build, for itself and for stakeholders, a reliable overall production plan that specified time and format for specific products? Could such a plan guide the development and specify the resource needs of new activities from new stakeholders, such as regional or local integrated assessments of combined development and contaminant issues? Would such a plan help the Arctic Council recognize AMAP workloads and determine AMAP priorities? Would the uncertainties of funding render such a planning exercise useless?

#### **7.4. How can AMAP influence and ensure the availability of timely, sufficient and appropriate data for its future assessment activities?**

Based on the activity map described above, could AMAP work with existing Arctic data sources and providers to anticipate data needs and deliver deadlines? Could out-year needs identified by AMAP influence data gathering or data recovery activities? In what specific venues, and based on what specific Arctic-wide or international data protocols and policies, could AMAP encourage broader and more timely data sharing and data access? Should data access planning occur broadly, across all AMAP (or all Arctic Council) activities, or should it become a specific requirement of each individual AMAP project?

#### **7.5. How should AMAP 'publish' its products?**

Should AMAP publish most or all of its products as special issues in open access peer reviewed scientific journals? Would such a practice increase the credibility of the products and increase the participation of scientific contributors? How would such a practice change AMAP's production workloads and delivery times? Could AMAP develop successful working relationships with several scientific journals? How would such a policy and practice change the nature of reports to

and review by the Arctic Council, or change or improve internal and external perceptions of relevance and legitimacy?

#### **7.6. How should AMAP interact and communicate with Arctic residents?**

If, as we suspect and have noted above, funding limitations underlay many of the obstacles preventing Arctic individuals, communities, and indigenous organizations from effectively participating in the full range of AMAP activities, then we ask whether AMAP should advocate for a change in practice and funding? Or, instead, should AMAP rethink entirely its connections to Arctic residents, with the goal of a substantially new and stronger mode of interaction? While indigenous peoples' organizations are part of AMAP, does AMAP have suitable and sufficient relationships with indigenous organizations to undertake either advocacy or re-evaluation? What related and additional communication mechanisms should AMAP develop to publicize its work within Arctic communities and to develop and advocate effective plans for future participation? Should AMAP partnerships with Arctic residents become a prominent feature of its overall communication, education and outreach plans and activities?

## **8. CONCLUDING REMARKS**

As expected for a productive and effective program engaged successfully with a large number and wide variety of stakeholders, our assessment exposed strong interest in AMAP's future and many serious suggestions for improvements and new activities. We identify as the most common and persuasive suggestions for improvement attention to: data access and data sharing issues; increasing the timeliness, impact and perhaps regularity of the AMAP assessments; better integration of the AMAP activities in the context of climate and with, for example, related ecosystem or biodiversity assessments; and a general increase in AMAP's profile through more effective outreach. We strongly endorse the suggestions by many partners that AMAP, as a leading producer of scientific and environmental

assessments, work with other partners to develop better coordination and integration among assessment products, in particular to enhance the ability of the research, environmental monitoring and policy making communities to identify the connections and the mutual priorities among these assessments.

Looking ahead, we anticipate a decade of change in the Arctic that will make the work of AMAP more urgent and more challenging. AMAP and its partners will certainly need to examine and perhaps modify current monitoring and assessment practices. The research, monitoring, commercial and residential communities we represent regard AMAP as an essential partner for understanding these changes and assessing

current and future impacts. We support AMAP as it works with partners and stakeholders to prepare for these changes and to ensure the continuing relevance of its products.

We believe the Arctic will remain in global public attention. An increasing number of organizations want to have a say its future, while Arctic peoples will need to ensure the strength and viability of their institutions and communities. In its evolving role and in all future activities AMAP will need to cooperate with and inform a wider range of public and private sector organizations. To its traditional strength of high quality science-based assessments, AMAP will need to add effective science communication and education.