

ARCTIC MONITORING AND ASSESSMENT PROGRAMME (AMAP): Work Plan 2015–2017

Summary of Work Plan

The AMAP work plan 2015-2017 continues the work to monitor and assess the status of the Arctic region with respect to pollution and climate change by documenting the levels and trends, pathways and processes, and effects on ecosystems and humans, and to propose actions to reduce associated threats for consideration by governments. Regional assessments will be produced under the Adaptation Actions for a Changing Arctic (AACA) process for the Barents, Baffin Bay/Davis Strait, and Bering/Chukchi/Beaufort regions that will contain information to assist local decision-makers and stakeholders to develop adaptation tools and strategies to deal with climate change and other environmental stressors. An overall, integrated AACA report will also be prepared. Assessments of the freshwater budget and the carbon cycle of the Arctic are under preparation as well as updated assessments of Arctic land ice, permafrost, glaciers and ice caps, and feedbacks and trends in the cryosphere. Further work on Arctic Ocean acidification will continue, with more focus on case studies in specific areas. An assessment of contaminants of emerging concern in the Arctic ecosystem will be prepared. Guidelines regarding the use of unmanned aircraft systems for scientific monitoring and research in the Arctic will be finalized. Work will continue under the Sustaining Arctic Observing Systems (SAON) program, and AMAP will continue to provide input to the work of other international organizations.

Arctic Council United States Chair Priorities

Improving Economic and Living Conditions

Adaptation Actions for a Changing Arctic (AACA)

Co-leads: Barents Regional Implementation: Norway, Russia, Sweden, Finland
Baffin Bay/Davis Strait Regional Implementation: Denmark/Greenland, Canada
Bering/Chukchi/Beaufort Regional Implementation: USA, Russia, Canada

Rationale/Objectives: Work will continue on Arctic-focused climate and integrated environmental frameworks and models that can improve projections of climate change and other relevant drivers of Arctic change in order to improve predictions and inform the development and implementation of adaptation actions by Arctic States and Permanent Participants. This project aims to clarify the basis for adaptation strategies to meet user needs and analyse consequences that may occur in relation to combined effects on ecosystems and socio-economic development. Information for relevant sectors will be compiled and evaluated, and integrated regional reports and other products will be prepared to improve predictive capability of the consequences of climate change and other relevant drivers of change.

Main activities: AMAP is leading the work on this part, which is being developed in collaboration with other relevant Arctic Council working groups and international science organisations. An interim report will be presented in 2015, other products are anticipated during 2015–2017, and final integrated reports will be produced in 2017.

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation); Project funding obtained for coordination activities and parts of the Barents and Baffin Bay/Davis Strait regional implementation; budget falls within Arctic Council category C: 500K-1000K USD for the entire period

Benefits to Arctic residents: **The AACA project will inform the development of strategies and tools to adapt to a changing Arctic**

Food and Water Security including Arctic Freshwater Synthesis component of Snow, Water, Ice and Permafrost (SWIPA) update

Co-lead: Canada

Rationale/Objectives: Information relevant to this subject will be provided by AMAP assessment groups including the Human Health Assessment Group and the AMAP/International Arctic Science Committee (IASC)/WRCP CliC (World Climate Research Programme's Climate and the Cryosphere project) joint project on Arctic Freshwater Synthesis. This latter assessment is one component of the update of the 2009 AMAP SWIPA assessment. This component will prepare the first overall budget of freshwater resources in the Arctic and a synthesis of the current status.

Main activities: Planned work includes the preparation of an overall budget for the freshwater resources in the Arctic and projections on the influence of climate change on hydrological conditions.

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation); AMAP Secretariat handles project funding for coordination activities; budget falls within Arctic Council category A: 0-250K USD

Benefits to Arctic residents: **AMAP is updating its assessment of the influence of climate change on Arctic freshwater systems to ensure the basic right of water security**

Addressing the Impacts of Climate Change in the Arctic

Adaptation Actions for a Changing Arctic (AACA)

See above

Update of Snow, Water, Ice and Permafrost (SWIPA) assessment

Co-leads: Canada, Norway, USA (Sea Ice); Norway, Russia, USA (Permafrost); Russia, USA (Arctic trends and feedbacks); Canada (Snow); Denmark/Greenland (Carbon cycle); Denmark/Greenland, Russia, Canada (Land ice); Canada (Arctic freshwater synthesis)

Rationale/Objectives: This assessment will update parts of the 2009 AMAP SWIPA Assessment, using updated climate change scenarios and more refined models as well as more recent information on current and projected changes in the cryosphere of the Arctic. Relevant information from this work will be provided to the AACA project.

Main activities: Planned work and deliverables include updated information on trends and projections of climate-induced changes in Arctic snow, ice and hydrological conditions.

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation); AMAP Secretariat handles project funding for coordination activities; budget falls within Arctic Council category B: 250K-500K USD

Benefits to Arctic residents: **AMAP assessments of climate-change effects on Arctic ice and snow are being updated to inform policy on mitigation and adaptation options**

Scientific evaluation of Short-Lived Climate Pollutants (SLCPs) in the Arctic

Co-leads: Canada, Norway, USA

Rationale/Objectives: AMAP will continue to address short-lived climate pollutants (black carbon, ozone and methane) and their impacts on Arctic climate to implement follow-up actions arising from assessments delivered by the AMAP methane and black carbon/ozone expert groups and the Arctic Council Task Force on Black Carbon and Methane in line with decisions of the Arctic Council at their meeting in 2015.

Main activities: This work will address, among others, improved monitoring, modelling and assessment of trends and effects of short-lived climate pollutants in the Arctic.

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation); AMAP Secretariat handles project funding for coordination activities; budget falls under Arctic Council category A: 0-250K USD

Benefits to Arctic residents: **Continued AMAP support for development of action on black carbon, ozone and methane will have potential Arctic climate and health benefits**

Stewardship of the Arctic Ocean

Updated assessment of Arctic Ocean Acidification

Co-leads: Norway, USA

Rationale/Objectives: This assessment will update the 2011 AMAP Arctic Ocean Acidification Assessment, including new information on the extent and effects of acidification in the Arctic Ocean, particularly in relation to biological effects, and will contain case studies of the impacts of ocean acidification in several specific Arctic areas.

Main activities: Planned work and deliverables include an updated assessment of Arctic Ocean acidification to be delivered in 2017.

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation); AMAP Secretariat handles project funding for coordination activities; budget falls within Arctic Council category B: 250K-500K USD

Benefits to Arctic residents: **AMAP's Arctic Ocean acidification assessment update will inform policy development concerning sustainable marine resources and food security**

Other AMAP Working Group Priorities

AMAP Trends and Effects Monitoring Programme: Implementation 2015-2017 and related Arctic monitoring and research activities

Co-leads: All countries participate according to their AMAP national implementation plans; observer countries and organizations also participate; traditional and local knowledge also included

Rationale/Objectives: AMAP will continue to implement monitoring and assessment in accordance with the approved AMAP Strategic Framework for 2010+. AMAP will update its monitoring guidelines and protocols as part of an ongoing process, in particular to address areas relating to monitoring of cryosphere change, ocean acidification, and other impacts of climate change.

As part of its on-going work, AMAP will continue to coordinate work, based largely on national programs, to provide the information necessary for assessment of relevant issues such as:

- spatial and temporal trends in levels of contaminants in Arctic ecosystems, including humans, and radioactivity in Arctic ecosystems;
- biological/ecological effects of contaminants and associated trends, including human health effects;
- climate change, including ocean acidification, SLCFs and cryosphere;
- effects of climate variability and change;
- improved predictive capacity through increased observations, research and understanding of processes governing changes in the Arctic;
- human and ecosystem health effects; and
- combined effects of contaminants, climate change and other stressors, including effects on humans.

AMAP will continue to coordinate and deal with new activities to ensure appropriate data reporting and archiving, including reporting of data to AMAP Thematic Data Centres. AMAP will cooperate with international partners and arrange workshops to improve monitoring capability, including the use of remote sensing.

AMAP will also continue its work on coordination of Arctic monitoring and research through engagement in relevant initiatives under the EU's Horizon 2020 Programme (including EU-PolarNet) and the Third International Conference on Arctic Research Planning (ICARP III).

AMAP's Climate Expert Group and the Human Health Assessment Group will participate in the further development and implementation of special projects in Russia, including the project on the Lena and other Russian Arctic rivers under the GEF-Russian Federation Partnership, implementation of air monitoring, and follow-up on the Persistent Toxic Substances project.

Main activities: Environmental and human health monitoring.

Timeline: Ongoing activity (2015-2017 implementation period)

Budget: Primarily national in-kind implementation; total budget not assessed; budget falls within Arctic Council category A: 0-250K USD

Benefits to Arctic residents: **AMAP contaminant monitoring provides information that underpins and empowers Arctic residents engagement in international policy development**

Updated assessment of pollution issues

Co-leads: Canada, Sweden (Persistent Organic Pollutants, POPs)

Rationale/Objectives: As part of its ongoing work, AMAP will continue to evaluate emerging issues of concern related to pollution and climate change and their effects on Arctic ecosystems and populations. Plans for follow-up activities and products in relation to this as well as previously identified issues of concern will be developed as necessary.

Main activities: This work will prepare an update assessment of POPs, including chemicals of emerging Arctic concern, biological effects, and the influence of climate change on POPs, for delivery in 2017.

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation); AMAP Secretariat handles project funding for coordination activities; budget falls within Arctic Council category A: 0-250K USD

Benefits to Arctic residents: **Reducing contaminants from local and far distant sources improves food security and reduces risks of human health effects of contaminants**

Use of Unmanned Aircraft Systems (UAS) for scientific purposes in the Arctic

Co-leads: Norway, USA

Rationale/Objectives: AMAP will continue on safety guidelines and demonstrate the use of UAS in cross-jurisdictional environmental monitoring and other studies. This work will develop guidelines and proposals for the use of UAS in the Arctic for scientific and other appropriate activities.

Main activities: Guidelines and proposals for UAS use in the Arctic will be finalized.

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation); AMAP Secretariat handles project funding for coordination activities; budget falls within Arctic Council category A: 0-250K USD

Benefits to Arctic residents: **Use of unmanned aircraft systems could enhance ability to monitor and map the Arctic and may also aid search and rescue operations.**

Sustaining Arctic Observing Systems (SAON)

Co-leads: N/A

Rationale/Objectives: AMAP will contribute to the implementation of the SAON and continue to co-lead its development on behalf of the Arctic Council, together with the International Arctic Science Committee (IASC) with the aim of supporting and developing Arctic observing networks.

Main activities: The AMAP Secretariat, together with the IASC Secretariat, will continue to provide secretariat support.

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation); AMAP Secretariat receives funding from Norway to support secretariat activities in relation to SAON; budget falls within Arctic Council category B: 250K-500K USD

Benefits to Arctic residents: **Strong circum-polar monitoring networks and data sharing are key to understanding Arctic environmental, health and socio-economic conditions**

Support for international activities

Co-leads: N/A. Participants differ for each activity.

Rationale/Objectives: AMAP has been requested by the Arctic Council to support relevant activities under international bodies such as the UNEP (Stockholm Convention on POPs, Minamata Convention on mercury, UNFCCC) and UN ECE (LRTAP Convention) with regard to provision of Arctic information to relevant groups and supporting the development and implementation of global monitoring and other activities to ensure harmonization with the AMAP Trends and Effects Programme.

Main activities: Coordination and information exchange activities in relation to the following:

AMAP's science results and information: As part of its continuing work AMAP will participate in relevant international meetings and symposia to communicate its ongoing activities, as needed.

United Nations Environment Programme (UNEP) Chemicals Branch (DTIE): AMAP will continue to cooperate with UNEP on its activities related to UNEP's global mercury agreement, the Minamata Convention. (ICMGP 2015; GMA 2017 update)

Stockholm Convention and UN ECE Convention on Long-Range Trans-boundary Air Pollution: AMAP will present data products and collaborate with the Stockholm Convention and UN ECE LRTAP Convention Secretariats on relevant activities including monitoring, follow-up of work on climate change and POPs and delivery of information from ongoing update assessments of POPs of emerging Arctic concern. AMAP/HTAP modelling coordination

AMAP will also take into account the possible need to provide Arctic information products in connection with relevant Conventions, including information relevant to the inclusion of new chemicals in the existing Convention. Science Fair at Joint Basel/Rotterdam/Stockholm Conventions COP, May 2015

UNFCCC IPCC and the SWIPA assessment results: The results of SWIPA update assessments will be communicated to the IPCC.

EU-PolarNet and Trans-Atlantic Ocean Research Alliance: AMAP will be a partner in a new 5-year Horizon 2020 networking project that aims to establish an ongoing dialogue between scientists and relevant parties in the development of a plan for an integrated European research program and coordinated with, among other, Canada and the USA.

Combined Effects of Contaminants and Climate Change: The AMAP Secretariat will continue its leading role in this project, in cooperation with AMAP experts, and funded by the Nordic Council of Ministers and the Nordic countries. A final report will be prepared in 2015.

Timeline: 2015-2017

Budget: No specific budget exists for this activity; AMAP has received national donor support from some Arctic countries in the past to facilitate its engagement in specific UNEP/UN ECE activities such as supporting the production of the UNEP global mercury assessment. Much of the work constitutes in-kind contributions through AMAP expert groups.

Benefits to Arctic residents: **Results of Arctic environmental and health studies provide support to international pollution and climate conventions**

Communication and Outreach

Co-leads: N/A

Rationale/Objectives: AMAP will implement communication and outreach activities in accordance with the AMAP Communications and Outreach Plan and the Arctic Council's Communications and Outreach Guidelines in the dissemination of AMAP results to relevant stakeholders

Main activities: C&O activities will focus on delivery and dissemination of information arising from AMAP assessments and related-work addressing, *inter alia*: AACA, AOA, SWIPA, OGA, mercury, radioactivity, SLCFs, POPs, human health and SAON. AMAP communication and outreach will be accomplished through the production and dissemination of reports (including where possible their translation), films, fact sheets, website information, educational materials and other outreach products. AMAP will continue to contribute relevant AMAP-related scientific input to the Arctic Report Card

Timeline: 2015-2017

Budget: C&O activities are financed from available project funding that varies from project to project; there is no specific project budget attached to C&O activities other than finances associated with AMAP website server fees.

Benefits to Arctic residents: **Communication of AMAP results helps Arctic communities, residents and policy-makers understand changes in their climate and environment**

Input to Other Arctic Council Working Groups

Cross-cutting projects and activities: Ecosystem-Based Management Initiative; Circumpolar Biodiversity Monitoring Plan; Arctic Biodiversity Assessment implementation; Arctic Marine Strategic Plan work; Traditional and local knowledge initiative

Co-leads: N/A

Rationale/Objectives: Ecosystem-based assessment has been adopted by the Arctic Council as a fundamental principle in the Arctic Marine Strategic Plan; AMAP will support CAFF in the further development of the CBMP to ensure consistency with the AMAP monitoring guidelines and plans, and follow-up on the Arctic Biodiversity Assessment; TLK is incorporated in AMAP work where appropriate.

Main activities: Coordination of AMAP and PAME EBM group/CBMP group activities; Engagement of Arctic residents in all relevant AMAP activities

Timeline: 2015-2017

Budget: Unknown (national in-kind implementation; no specific budget exists for most of these activities); some countries provide direct funding to AMAP Secretariat to be used to support participation of indigenous experts in AMAP activities

Benefits to Arctic residents: **Cross-cutting cooperation on environmental, health and socio-economic issues enhances value of policy-relevant advice to Arctic communities**