

ARCTIC MONITORING AND ASSESSMENT PROGRAMME (AMAP): Progress Report 2013–2015

Mandate

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. AMAP produces sound science-based, policy-relevant assessments and public outreach products to inform policy and decision-making processes.

Response to Arctic Council priorities

Improving economic and social conditions: As health is an important aspect of society, the AMAP Human Health Assessment Group has prepared an updated assessment of the dietary exposure of Arctic populations to environmental contaminants, their health effects, and various means to communicate such risks to exposed groups.

Acting on climate change: AMAP expert groups have prepared scientific assessments of black carbon and tropospheric ozone and also of methane in the Arctic. The AMAP WG has prepared a summary report for policy-makers based on these two scientific assessments. The work under the AMAP expert groups on Short-Lived Climate Pollutants (SLCPs) has been conducted in parallel with the Arctic Council Task Force on Black Carbon and Methane (TFBCM).

Work to follow up AMAP's assessment of Snow, Water, Ice and Permafrost in the Arctic (SWIPA) has been initiated with regard to a freshwater budget for the Arctic and Arctic carbon cycling, and also to update the SWIPA assessment concerning the status of sea and land ice, glaciers and ice caps, snow and permafrost, and trends and feedbacks. These activities support AMAP's work under the project 'Adaptation Actions for a Changing Arctic' (AACAA), (see 'Other AMAP Working Group Priorities').

Protecting the Arctic environment: In relation to environmental contaminants, AMAP expert groups have prepared updated scientific assessments on radioactivity and on trends in persistent organic contaminants in the Arctic. The policy-relevant conclusions and recommendations from these two assessments, together with those from the updated assessment of human health in the Arctic, are being compiled in the report *Arctic Pollution 2015 – Summary for Policy-makers*. Follow-up work on AMAP's Arctic Ocean Acidification assessment (2013) has also been initiated.

AMAP Chair's summary

AMAP has completed technical reports on black carbon and tropospheric ozone and methane and their impact on climate in the Arctic; a policy-makers summary has been prepared of the overall results as a deliverable to the Ministerial Meeting. Three updated scientific assessments have been prepared covering 1) human health in the Arctic in relation to environmental contaminants and other stressors, 2) trends of persistent organic pollutants (POPs) in Arctic air, biota and humans, and 3) radioactivity in the Arctic. A policy-makers summary compiling the key results of these three assessments has been prepared as a deliverable for the Ministerial Meeting. Under the project 'Adaptation Actions for a Changing Arctic', Regional Integration Teams covering the three pilot areas, 1) the Barents region, 2) Baffin Bay/Davis Strait, and 3) the Bering/Chukchi/Beaufort region, have worked in cooperation with regional communities and other stakeholders to develop detailed plans for

their work and assessment reports. Sustaining Arctic Observing Systems (SAON) work has been enhanced with the establishment of two committees to consider data/information services and observations and networks covering the full range of Arctic social, economic, health and environmental sciences data and observations.

AMAP has worked closely with other entities of the Arctic Council on cross-cutting issues, as indicated under 'Input to Other Arctic Council Working Groups', and has engaged with international organisations and conventions. Results of Arctic Council work performed under the auspices of AMAP have been presented at scientific conferences and at public outreach events.

Main achievements in 2013–2015

Arctic Council Canadian Chair Priorities

Sustainable Circumpolar Communities: The updated AMAP human health assessment report contributes to this priority by addressing health aspects in relation to environmental contaminants in local traditional foods. This report acknowledges the nutritional and cultural values of traditional foods, but notes that certain food species in some Arctic areas contain concentrations of contaminants, particularly mercury, that can cause health effects in vulnerable groups, especially developing fetuses, infants and small children. Dietary advice can help indigenous communities to avoid contaminant exposure, but is complex and is not a long-term solution. This report also provides initial thoughts on adaptation issues for small Arctic communities to the combined impact of climate change, environmental contaminants and emerging increased risks of animal-borne infectious diseases.

Other AMAP Working Group Priorities

Adaptation Actions for a Changing Arctic (AACA): Activity on AACA included establishment of the AACA Integration Team and Regional Integration Teams for the three pilot areas chosen for the project: 1) Barents; 2) Davis Strait/Baffin Bay; and 3) Bering/Chukchi/Beaufort. These regional teams work in close consultation with stakeholders to produce information to assist local decision-makers and stakeholders to develop adaptation tools and strategies to deal with climate change and other environmental stressors. The three regions have prepared detailed assessment outlines and identified lead authors. The AACA Integration Team has provided overall coordination of this work, which has included workshops on climate scenarios and modelling and the preparation of a report on socio-economic drivers of change in the Arctic. AMAP is coordinating with other Arctic Council Working Groups and international science organizations in this work. A progress report on activities under the AACA project will be provided.

Tweet: AACA is assessing drivers of Arctic change in the Barents, Baffin Bay/Davis Strait, and Bering/Chukchi/Beaufort regions.

Assessment of Short-Lived Climate Pollutants in the Arctic: Two AMAP expert groups have completed assessments of the emission sources and long-range transport of black carbon and tropospheric ozone and methane to the Arctic and their effects on Arctic climate. Based on the results of these assessments, AMAP has prepared a policy-makers summary, the *Arctic Climate Issues* report, including key findings and conclusions of the two assessments, as a deliverable to the 2015 Ministerial Meeting. The work under the AMAP SCLP expert groups has been conducted in parallel with and provided technical input to the Arctic Council TFBCM.

Tweet: New AMAP assessments on black carbon, ozone and methane provide a scientific basis for decision-making to reduce impacts.

Updated assessment of human health in the Arctic: The AMAP human health assessment group has prepared an updated assessment covering the results of biomonitoring of concentrations of environmental contaminants in human residents in the Arctic, evaluation of the potential and observed effects of these contaminants, and risk assessment and risk communication issues for Arctic communities. This report also includes information on recent actions to assist small Arctic communities to adapt to the combined impacts of climate change, environmental contaminants, and emerging risks of infectious animal-borne diseases. A summary of the policy-relevant outcome of this assessment, containing conclusions and recommendations, has been included in the *Arctic Pollution 2015* report.

Tweet: Human exposure to many contaminants declined in parts but not all of the Arctic. Effects of newer contaminants need to be better understood.

Updated assessment of trends of POPs in the Arctic: AMAP has prepared an updated assessment of the temporal trends of persistent organic pollutants (POPs) in air and biota as well as in humans in the Arctic based on long-term monitoring data. This report has been provided to the UNEP Secretariat responsible for conducting an ongoing Stockholm Convention effectiveness evaluation review, in accordance with Arctic Council instructions that support AMAP implementation of the work under this Convention. A summary of the policy-relevant outcome of this assessment, containing conclusions and recommendations, has been included in the *Arctic Pollution 2015* report. Work on additional components of an updated POPs assessment is continuing that includes new contaminants of emerging concern in the Arctic and biological effects.

Tweet: Levels of many regulated POPs are generally declining, but there is emerging concern about new chemicals reaching the Arctic.

Updated assessment of radioactivity in the Arctic: This updated assessment includes new information on decommissioning and handling of radioactive waste; accidental releases of radioactivity, including assessment of the consequences for the Arctic of the Fukushima accident; and technologically enhanced releases of naturally occurring radionuclides (TENORM) from mining and oil and gas activities. A summary of the policy-relevant outcome of this assessment, containing conclusions and recommendations, has been included in the *Arctic Pollution 2015* report.

Tweet: Trace radioactive contamination from the Fukushima accident reached the Arctic, but at levels too low to cause concern.

Tweet: Remediation is reducing radioactivity sources in the Arctic but certain activities can enhance releases of naturally occurring radionuclides

Unmanned Aircraft Systems (UAS): The AMAP expert group on UAS has prepared an updated white paper on access in the Arctic for unmanned aircraft systems for scientific research and monitoring purposes. It has also prepared a manual of operating guidelines for the use of such vehicles. These documents should be ready for release later in 2015.

Tweet: Unmanned aircraft systems have potential for use in Arctic monitoring and also in search and rescue operations.

Sustaining Arctic Observing Systems (SAON): SAON has further developed its work by the establishment of two committees: the Committee on Data and Information Services will prepare overall strategies to improve the situation for easier access to data and information

in northern areas, and the integration and dissemination of data and information through a SAON-led Circum-Arctic Information System. The Committee on Observations and Networks will prepare overall strategies to improve the collection of data and information from observations relating to Arctic social, economic, health and environmental sciences, including options for long-term funding of operations and the establishment of a set of early-warning indicators for change in the Arctic.

Tweet: Two committees have been established to further the work of SAON on data and information services and observation networks.

Arctic Ocean Acidification: Following the delivery of the Arctic Ocean Acidification (AOA) assessment and its related policy-makers summary report in 2013, AMAP has begun a follow-up activity based on the recommendations in the assessment report.

Tweet: Arctic Ocean acidification has potential to affect livelihoods from subsistence and commercial fisheries: assessing key impacts a priority

Technical support for UNEP: AMAP provided technical input to the ongoing Stockholm Convention effectiveness review process and continues to communicate relevant results of AMAP work on new chemicals to the groups under the Stockholm Convention and LRTAP Convention responsible for reviewing chemicals proposed for listing under these agreements. AMAP contributed to the work to secure the agreement of the Minamata Convention on mercury, including the work to prepare the UNEP Global Mercury Assessment (GMA) 2013. These activities ensure that Arctic information is well represented in the work of the Conventions.

Tweet: AMAP's Arctic information contributed to the establishment of the Minamata Convention and further development of the Stockholm Convention.

Translation of reports: The overview report on SWIPA and the Arctic Ocean Acidification Overview report as well as the AACA information brochure have been translated into both Russian and Saami and will be published soon.

Tweet: AMAP overview reports on SWIPA and Arctic Ocean Acidification and AACA brochure translated into Russian and Saami available soon

Input to Other Arctic Council Working Groups

SDWG: AMAP endeavors to implement Traditional and Local Knowledge (TLK) in AMAP work and activities, where appropriate, and has reviewed and commented on the SDWG proposals on TLK.

PAME: AMAP contributed to the PAME Arctic Ocean Review and the Arctic Marine Strategic Plan, and delivered the Arctic Marine Shipping Assessment (AMSA) IIC report on environmentally sensitive areas in the Arctic. AMAP also contributes to PAME-led work on the ecosystem-based approach. AMAP held a joint meeting with PAME in Whitehorse in September 2014.

CAFF: AMAP has contributed to the follow-up of the Arctic Biodiversity Assessment and the Circumpolar Biodiversity Monitoring Programme.

EPPR: The work of the AMAP expert group on UAS is relevant to the EPPR work in relation to search and rescue in the Arctic.