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1. Introduction: Response to Arctic Council priorities

As part of its mandate, AMAP continues to work to update information on climate change and pollution issues, and their implications for Arctic physical environments, ecosystems, and human health – essential for providing policymakers with the most recent and relevant information for decision making. AMAP's work on climate and pollution issues underpins the Arctic Council's overarching goals of addressing environmental protection, sustainable development and scientific cooperation, including the present Arctic Council's chairmanship priority on how environmental changes can affect Arctic inhabitants and their livelihoods.

AMAP's work is planned to ensure that Arctic / Arctic Council information is delivered in a timely manner and effectively communicated to a number of relevant audiences, including in key international fora. Especially important in this respect is supporting the further development and implementation of the UN Environment Programme's Stockholm (POPs) and Minamata (mercury) Conventions as well as the UN Economic Commission for Europe's Air Convention (Convention on Long-range Transboundary Air Pollution), and work targeting the needs of the UN Framework Convention on Climate Change and Intergovernmental Panel on Climate Change.

Preventing and reducing anthropogenic pollution in the Arctic, including identification and the elimination of environmental hot spots in the Arctic region – The Russian AC Chairmanship continues the priority established under the Finnish and Icelandic Chairmanships to address greenhouse gas emissions, including SLCFs. AMAP contributes to this work through its Expert Groups on Climate and SLCFs that is working in close cooperation with the AC Expert Group on Black Carbon and Methane (EGBCM). This work also relates to the Russian Chairmanships priorities on consequences of permafrost thaw and emissions from and climate impacts of Arctic wildfires.

Continued meteorological cooperation (*Arctic Council strategic action 1.6*) has promoted an Earth System Science approach by intensifying cooperation on meteorological, oceanographic and terrestrial observations, research and services, and an increased focus on sustained observation networks and continuous monitoring in the Arctic. These are issues of importance to AMAP and the Sustaining Arctic Observing Network (SAON), as well as observing and modelling communities in general. To support a continued cooperation, AMAP has supplemented its Climate Expert Group with experts on meteorology

2. Summary of progress on AMAP projects in the work plan 2021-2023

Contaminants

Mercury (Arctic Council strategic action 2.1 – 2.3)

The results of the *2021 Assessment of Mercury in the Arctic* were delivered in the form of a Summary for Policy-makers (SPM) to the Arctic Council at their Ministerial meeting in May. The full underlying scientific assessment report is in the final stages of editing and publication. Communication of the results of the assessment includes preparation of articles for a Special Issue of Science of the Total Environment. An application has been submitted for a session to present the AMAP scientific assessment findings at the 2022 International Conference on Mercury as a Global Pollution. Additional communications and outreach targeting policy fora include an AMAP

contribution to a side-event being organized by ICC and Canada in connection with the Minamata COP-4 (virtual) meeting in November 2021 with additional outreach planned for 2022.

Persistent Organic Pollutants (POPs) (Arctic Council strategic action 2.1 – 2.5)

The results of the 2021 *Climate Change on POPs* were delivered in the form of a Summary for Policy-makers (SPM) to the Arctic Council at their Ministerial meeting in May. This updated previous work in 2002 and joint work with UNEP on this subject in 2011. The fully underlying scientific assessment report is in the final stages of editing and publication. Results will be communicated at a session of the SETAC-Europe science conference in Copenhagen in May 2022 and in a themed issue of a scientific journal, and outreach undertaken to relevant groups of the Stockholm Convention.

Litter and microplastics (Arctic Council strategic action 2.1 – 2.5)

AMAPs *Litter and Microplastics Expert Group* (LMEG) delivered a monitoring plan including monitoring guidelines for litter and microplastics to the Arctic Ministerial meeting 2021. In the period 2021-23, work will be undertaken to identify knowledge gaps when it comes to physical and chemical effects of litter and microplastics on biota in cooperation with the *AMAP POPs Expert Group*. There will also be focus on the evaluation of the implementation of the monitoring guidelines and any needs there may be for the update of guidelines. Finally, there will be focus on the implementation plan for the *ML-RAP*.

Radioactivity (Arctic Council strategic action 2.1 – 2.5)

An updated assessment of radioactivity issues of concern is planned for delivery in 2023. The assessment will describe the main sources of artificial radionuclides to and within the Arctic and the recent trends in activity concentrations of anthropogenic radionuclides in the Arctic environment. It will also provide new information about radioactive waste handling and decommissioning. It will report on the sources and recent trends in activity concentrations of naturally occurring radionuclides in the Arctic environment and will finally address possible effects that climate change might have on radioactivity in the Arctic.

Human Health (Arctic Council strategic action 2.1 – 2.5, 4.1, 4.4)

The results of the 2021 assessment of human health in the Arctic were delivered to the Arctic Council Ministerial Meeting in May as a *Summary for Policy-makers*. The underlying scientific assessment report is in the final stages of production. Results of this assessment were communicated at the conference on “Problems of Health Maintenance and Sanitary-Epidemiological Well-being Provision of Arctic Population” on 21-22 October 2021 in St. Petersburg, Russia. There are also plans to publish results in a special issue of a scientific journal.

AMAP – SDWG Biosecurity (Arctic Council strategic action 2.1 – 2.5, 4.1, 4.4)

AMAP has in cooperation with SDWG developed an outline for a brief report on biosecurity, with a focus on emerging threats, including zoonoses. The report will be peer reviewed and have a completion deadline early 2023, for presentation at the 2023 Ministerial.

New work is being considered to better link AMAP work on contaminants in wildlife and human health. The contaminants-related activities of AMAP including those addressing human health are

supporting the ongoing effectiveness evaluation under the Stockholm Convention, and work to develop and implement the Minamata Conventions.

Climate Change (Arctic Council strategic action 1.1 – 1.6)

The results of the *Arctic Climate Change Update 2021: Key Trends and Impacts* were delivered to the Arctic Council Ministerial Meeting in May as a *Summary for Policy-makers*. The underlying scientific assessment report is in the final stages of production. Some results have already been published in scientific journals and additional articles are being produced. AMAPs Climate work will also be linked to planned AMAP work on wildfire emissions and associated climate and air quality impacts.

A scoping document for the joint AMAP-CAFF initiative addressing climate change impacts on Arctic marine, freshwater and terrestrial ecosystems and ecosystem feedbacks to climate was approved by AMAP HoDS and the CAFF Board in May 2021. Work is underway on a plan for the implementation of this project under the AMAP and CAFF workplans for 2021-2025. The implementation plan will be ready by the end of 2021 and will include a dedicated workshop to facilitate co-production with Permanent Participants.

As a continuation of the chapter on societal impacts of climate change in the Arctic in the 2021 climate update report, scoping is underway for broader assessment of societal impacts that will include those associated with ecosystem impacts, as identified under the AMAP-CAFF project as well as climate change impacts on human health, which will ultimately involve SDWG.

Short-lived Climate Forcers (SLCFs) (Arctic Council strategic action 1.1 – 1.6, 2.1 – 2.3, 4.1)

The AMAP SLCF Expert Group completed its integrated assessment of air pollution issues with a focus on short-lived climate forcers (SLCFs) and these were delivered to the Arctic Council in the form of a Summary for Policy-makers (SPM) at their Ministerial meeting in May. The scientific assessment report is expected to be published by the end of the year. Scientific articles based on the assessment are being prepared for a Special issue jointly organized between Atmospheric Chemistry and Physics and Biogeosciences. Follow-up work is planned under the AMAP Workplan for 2021-2023, including continuation of work addressing Arctic wildfires that will be the subject of coordination with related work under other AC WGs. Additionally, AMAP will investigate possibilities to exploit the opportunity afforded by the Covid-19 pandemic shutdowns to evaluate the effects on Short Lived Climate Forcers and Greenhouse Gasses as well as the consequences of reduced human activities on climate, ecosystems and health.

Key findings from both the *Arctic Climate Change Update 2021: Key Trends and Impacts* and *Impacts of Short-Lived Climate Forcers on Arctic climate, air quality and human health (2021)* was presented on four side-events at the UNFCCC COP 26 in Glasgow, in November.

Implementation of AMAP Strategic Framework (Arctic Council strategic action 6.1-6.6, 7.3, 7.4, 7.6)

AMAP Strategic Framework 2019+, emphasizes five strategic goals related to the need for collaborative assessment processes; access to data; inclusive partnership with Indigenous Peoples; effective communication and the timeliness and relevance for international processes. The AMAP WG has begun a process to oversee the implementation of AMAP recommendations including the

participation of Permanent Participants, and all work endeavors to engage Permanent Participants (PPs) and utilize Indigenous and Traditional and Local Knowledge where applicable.

Future perspectives

AMAP are continuing the development of future work programme activities in cooperation with internal and external partners.

3. Deliverables for the next Ministerial

AMAP deliverables currently intended for the 2023 AC Ministerial Meeting include a series of 'Summary for Policy-Makers' that will communicate the results of the work described above.

4. Working Group administration and next meeting(s)

AMAP have held monthly virtual Heads of Delegation meetings, and a virtual Working Group meeting with observers 23-24 November 2021.

5. Collaboration with other working groups / other organizations (*Arctic Council strategic action 6.1-6.6*)

AMAP works closely with several of the working groups, task forces and Observers within the Arctic Council. AMAP involvement in cooperation on cross-cutting issues includes:

- CAFF: Joint AMAP-CAFF scoping of an assessment of Ecosystem Impacts of Climate Change and feedbacks to climate, as described above. AMAP participates in monthly meetings of CBMP Steering Groups. Coordination on work on wildfires.
- EPPR: Liaising and coordination on ongoing and upcoming work on wildfires and radiation.
- PAME: AMAP has prepared a monitoring plan and monitoring guidelines on litter and microplastics in cooperation with PAME's initiative to develop a Marine Litter Regional Action Plan (ML-RAP). The AMAP Secretariat follows other related PAME work.
- SDWG: AMAP cooperates on health-related issues as described above, as well as coordination of potential upcoming workplan activities (methane gas hydrates).
- ACAP: AMAP has established liaison processes to follow-up with ACAP on work related to POPs and mercury, work on SLCFs (including wildfires), and plastics.
- EGBCM: AMAP continues to work closely with the EGBCM in work connected with AMAP assessment of SLCFs, to ensure that this work is responsive to the needs of the EGBCM. AMAP participated remotely in EGBCM meetings in October 2021.

AMAP relies on sharing of data and information, as well as cooperative assessment to improve understanding of challenges and opportunities, between AMAP, research and educational institutions, international and partner organizations. AMAP therefore continues to cooperate with:

- *IASC* – in relation to assessment activities, coordination of peer review processes, and as co-sponsor of SAON.
- *UN-Environment* - on activities connected with the UNEP global mercury process (Minamata Convention), Stockholm Convention's POPs Review Committee and Effectiveness Evaluation process. AMAP collaborates with UN Environment in work to produce and publish reports arising from the GMA.
- *UN ECE* –AMAP has enhanced cooperation with the Convention on Long-range transboundary air pollution (CLRTAP) bodies.

- *WMO* – AMAP continues to collaborate on meteorological initiatives, especially through the *WMO Executive Council Panel of Experts on Polar and High Mountain Observations, Research and Services* (EC-PHORS) and the Arctic Regional Climate Centre Network (ArcRCC-N).
- *SAON* - to enhance and strengthen observational networks and sharing of data and knowledge, including activities in connection with the Arctic Observing Summit in 2022.
- *IPCC* – AMAP climate products are being utilized in relevant IPCC reports.