

Arctic Monitoring and Assessment Programme (AMAP)

AMAP Workplan 2025-2027

Implementation Plans

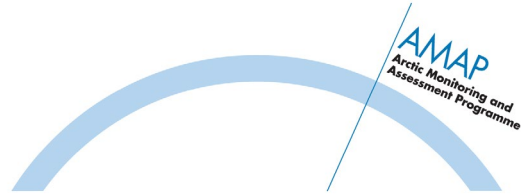
AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impacts on Arctic ecosystems and human populations.

AMAP is currently implementing its agreed biannual [AMAP Work Plan for 2025-2027](#) under the Kingdom of Denmark's Chairship of the Arctic Council.

This document presents the detailed plans for implementing AMAP work to address:

- Pollution Issue: Mercury in the Arctic
- Pollution Issue: Persistent Organic Pollutants (POPs) and Chemicals of Emerging Arctic Concern (CEAC)
- Pollution Issue: Litter and Microplastics
- Pollution Issue: Radioactivity in the Arctic
- Cross-cutting Issue: Human health in the Arctic
- Cross-cutting Issue: Contaminants-Wildlife and Human Health in the Arctic
- Cross-cutting Issue: Short-lived Climate Forcers in the Arctic
- Climate Issues: Climate Change in the Arctic

These plans are intended to help advance project-level work under the current AMAP Workplan in accordance with the [AMAP Strategic Framework 2019+](#) and to provide the AMAP Working Group and wider community with a common understanding of ongoing and planned AMAP activities.



AMAP Implementation Plans: Overview

(version June 2025)

(version: 2 June 2025)



AMAP Implementation Plans: Overview

Overview of implementation plans in relation to planned products for work over the period 2025-2027

Product / target delivery date	Main activities (responsible) / Status
1. Summaries for policy-makers (SPMs)	
Local vs LRT SMP / fall 2025 (tbc)	<i>Organization of work:</i> POPs EG co-leads Pending completion of scientific journal articles (for status see <i>Annex A</i>) and critically the summary article. <i>Outreach:</i> Plan for presentation of results and recommendations at POPRC side-event (September 2025) organized by EG-leads
Policy communication: black carbon as a climate forcer / fall 2025	<i>Organization of work:</i> SLCF EG co-leads Initial drafting work and expert consultations completed. Draft for discussion with tracking-HoDs to be circulated. <i>Outreach:</i> Possible coordination of outreach with CCAC; targeted outreach for IPCC/AR7 process and UN ECE Air Convention work fall 2025
Arctic climate implications of the global methane pledge / fall 2025 (tbc)	<i>Organization of work:</i> SLCF EG co-leads Not started (pending HoDs decision) <i>Outreach:</i> Possible coordination of outreach with CCAC (possible high-level event focusing on methane pledge); targeted outreach for UNFCCC COP
AMAP Climate Update 2026 / 2027	<i>Organization of work:</i> CEG co-leads Not yet started; awaiting finalization of background document chapters after peer review in spring 2026. <i>Outreach:</i> Planned presentations at conferences such as Arctic Frontiers, ASSW, Arctic Circle Assembly; targeted outreach for IPCC/AR7; possible side event at UNFCCC COPs
SICCA	<i>Organization of work:</i> SICCA assessment co-leads

(version: 2 June 2025)



Product / target delivery date	Main activities (responsible) / Status
	<p>Not started; awaits finalization of assessment report chapters after peer review in spring/summer 2026.</p> <p><i>Outreach:</i> Planned presentations at conferences such as Arctic Frontiers, ASSW, Arctic Circle Assembly; targeted outreach for IPCC/AR7; possible side event at UNFCCC COPs</p>
2. Update Assessments	
Assessment report on POPs trends / 2027	<p><i>Organization of work:</i> POPs EG co-leads</p> <p>Nomination of project group: completed (identified through expression of interest sent to POPs EG members)</p> <p><i>Preparation of report:</i> chapter leads identified, data acquisition underway</p>
SICCA / 2027	<p><i>Organization of work:</i> SICCA Assessment co-leads</p> <p>Detailed chapter outlines under preparation; contributors being identified.</p> <p><i>Outreach:</i> Presentations at conferences such as Arctic Frontiers, ASSW, Arctic Circle Assembly; targeted outreach for IPCC/AR7; possible side event at UNFCCC COPs</p>
AMAP Climate Update 2026 / 2027	<p><i>Organization of work:</i> CEG co-leads</p> <p>Chapter outlines prepared, contributors identified and early drafting beginning.</p> <p><i>Outreach:</i> Presentations at conferences such as Arctic Frontiers, ASSW, Arctic Circle Assembly; targeted outreach for IPCC/AR7; possible side event at UNFCCC COPs</p>
3. Technical reports and data products	
Technical report scoping use of Hg isotopes / 2026	<p><i>Organization of work:</i> Mercury EG co-leads</p> <p><i>Nomination of project group:</i> completed</p> <p><i>Preparation of report:</i> under development (first draft: fall 2025; final draft: spring 2026)</p>
Technical report scoping REEs/GTEs as a potential issue of Arctic concern / 2026	<p><i>Organization of work:</i> Mercury EG co-leads</p> <p><i>Nomination of project group:</i> completed</p>

(version: 2 June 2025)



Product / target delivery date	Main activities (responsible) / Status
	<i>Preparation of report: work organization ongoing</i>
Technical report scoping possible new approaches to monitoring for assessment of contaminant effects on wildlife and humans / 2026	<i>Organization of work: Project group (lead Nil Basu, Canada)</i> <i>Nomination of project group: completed</i> <i>Preparation of report: work organization ongoing</i>
Data products / possible technical report on mercury time-series analyses / 2026	<i>Organization of work: Mercury EG co-leads</i> <i>Data acquisition: initiated (not currently connected to POPs time-series data acquisition)</i>
Technical report scoping Arctic implications and of risks of climate interventions to inform possible further work / 2026	<i>Organization of work: Establishment of a project group</i> <i>Nomination of project group: not yet started</i>
Technical report on trends in contaminants in humans	<i>Organization of work: HHAG co-leads</i> <i>Data acquisition: literature scan and data collection started</i> <i>Preparation of report: work to begin in autumn 2025 after data collection well advanced / completed</i>
Technical report on updating dietary transitions in Arctic communities	<i>Organization of work: HHAG co-leads</i> <i>Data acquisition: literature scan to begin in autumn 2025</i> <i>Preparation of report: draft outline and identification of contributors in winter 2026</i>
4. Activities in support of assessments	
Updating of AMAP Trends and Effects Monitoring Programme / 2026	<i>Organization of work: Secretariat in consultation with relevant EG-leads and tracking HoDs</i> Proposal for phased approach to update programme and document in an online resource to be prepared for WG38
Preparation of a synthesis Report as a basis for follow up under AMAP/CAFF project “Climate change impacts on Arctic ecosystems and associated feedbacks”	Synthesis report based on results from WP1 on Indigenous Knowledge and WP2 special issue papers, format TBD pending updated implementation plan
Development of guidelines for monitoring zoonotic diseases	<i>Organization of work: Establishment of a project group</i> <i>Nomination of project group: not yet started</i>

(version: 2 June 2025)



Product / target delivery date	Main activities (responsible) / Status
Implementation of co-production in ongoing and planned AMAP work / 2027	Several ongoing and new activities include plans for PP engagement and incorporation of IK, but comprehensive implementation of co-production requires further development initiatives. Possible new PP-led activity on use of IK in assessment work.
Mercury webinar series / ca. 4-6 per year	<i>Organization of work:</i> Mercury EG co-leads <i>Web posting follow-up:</i> Secretariat
POPs LvLRT webinars / September 2025	<i>Organization of work:</i> POPs EG co-leads <i>Web posting follow-up:</i> Secretariat
AMAP website development	<i>Organization of work:</i> Secretariat Website technical development ongoing (redesign; implementation of new CMS)
Preparations for the first full AMAP assessment on plastic pollution in the Arctic	<i>Organization of work:</i> Litter and Microplastics Expert Group (LMEG). <i>Main activity:</i> Creating overviews of data across the four Priority 1 compartments: Beaches/shorelines, sediments (freshwater and marine), water (freshwater and marine), and seabirds. Mapping of existing environmental data within prioritised compartments ('mini-assessment'). <i>Status:</i> Not initiated.
Preparations for the first full AMAP assessment on plastic pollution in the Arctic	<i>Organization of work:</i> Litter and Microplastics Expert Group (LMEG). <i>Main activity:</i> Scoping document for assessment. <i>Status:</i> Not initiated.
Updating the AMAP litter and microplastics monitoring guidelines / 2026	<i>Organization of work:</i> Litter and Microplastics Expert Group (LMEG). <i>Main activity:</i> Formulation of recommendations on the need to update the technical method guidelines. Recommendations for HoDs for review in 2026. <i>Status:</i> Not initiated
Preparations for assessment on radioactivity in the Arctic / 2026	<i>Organization of work:</i> Radioactivity Expert Group (REG). <i>Main activity:</i> Scoping document for assessment in 2026 <i>Status:</i> Not initiated
5. Major outreach initiatives	
POPRC-21 side event / fall 2025	Side-event POPs EG leads
Arctic Circle Assembly 2025	4 proposals submitted May 2025

(version: 2 June 2025)



Product / target delivery date	Main activities (responsible) / Status
Minamata COP6	TBD
UNFCCC COP30	TBD
Scientific report on effects on biota (gap analysis) / Communication of results	Webinar 25th June

Implementing AMAP Strategic Goals and Guiding Principles

Implementation plan	Work track	Strategic goals ¹					Guiding Principles ²					
		SG1	SG2	SG3	SG4	SG5	GP1	GP2	GP3	GP4	GP5	GP6
Mercury in the Arctic	Updating ATEMP	X	X			X	X		X	X	X	X
	Scoping use of Hg stable isotopes	X								X		
	Scoping REEs/GTEs	X								X		
	Updating Hg time-series analyses	X	X		X	X	X				X	X
	Co-production	X	X	X	X	X		X	X		X	X
	Minamata Convention EE support	X			X	X					X	
Persistent Organic Pollutants and CEACs	Stockholm Convention EE/POPRC support	X			X	X					X	
	Updating ATEMP	X	X			X	X		X	X	X	X
	Communication of policy-relevant findings	X		X	X	X			X	X	X	
	Updating POPs time-series analyses	X	X		X	X	X				X	X
	Co-production	X	X	X	X	X		X	X		X	X
Short-lived Climate Forcers	Updating ATEMP	X	X			X	X		X	X	X	X
	Knowledge synthesis-black carbon	X			X	X	X				X	X
	Knowledge synthesis-methane	X			X	X	X				X	X
	Knowledge synthesis-wildfire impacts	X			X	X	X			X	X	X
	Support for work of EGBCM					X	X				X	X
Climate Change in the Arctic	2026 Climate update report	X				X	X		x			
	SICCA	X		x		X	x	x	X			

¹ **SG1:** Improved knowledge/understanding of Arctic change through collaborative assessment processes, for use in evidence-based decision-making. **SG2:** A strong, sustained and coordinated circumpolar monitoring and observation network. **SG3:** Enhanced understanding of Arctic change and its impacts through inclusive partnership with Indigenous Peoples and local residents. **SG4:** Effective communication on Arctic challenges and global implications. **SG5:** Support relevant international processes.

² **GP1:** Scientific Integrity. **GP2:** Value of Diverse Perspectives. **GP3:** Inclusion of Arctic Indigenous Peoples and Local Residents. **GP4:** Responsiveness to Emerging Challenges. **GP5:** Knowledge Mobilization. **GP6:** Cooperation, Coordination and Interaction.

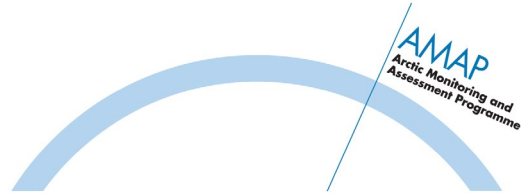
(version: 2 June 2025)



Implementation plan	Work track	Strategic goals ¹					Guiding Principles ²					
		SG1	SG2	SG3	SG4	SG5	GP1	GP2	GP3	GP4	GP5	GP6
	Climate change impacts on Arctic ecosystems and associated feedbacks	X		X		X	X		X			
	Scoping risks and implications of climate interventions						X			X		
Contaminants, Wildlife and Human Health	Zoonoses		X	X	X				X	X		X
	New approaches to monitoring	X	X			X	X		X	X	X	
Plastic pollution	Assessment on plastic pollution in the Arctic	X					X			X	X	X
	Updating the AMAP monitoring guidelines	X	X				X			X		X
	Support for international fora addressing global plastic pollution	X				X	X			X	X	X
	Engaging Indigenous People in addressing plastic pollution	X		X				X	X	X	X	X
	Communicating the findings on effects of plastic pollution on Arctic biota	X			X						X	X
Radioactivity	Scoping an assessment on radioactivity in the Arctic	X					X			X	X	X
	Strengthening collaboration with international fora	X				X	X			X	X	X

¹ **SG1:** Improved knowledge/understanding of Arctic change through collaborative assessment processes, for use in evidence-based decision-making. **SG2:** A strong, sustained and coordinated circumpolar monitoring and observation network. **SG3:** Enhanced understanding of Arctic change and its impacts through inclusive partnership with Indigenous Peoples and local residents. **SG4:** Effective communication on Arctic challenges and global implications. **SG5:** Support relevant international processes.

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Pollution Issue: Mercury in the Arctic
(version May 2025; approved June 2025)

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address Mercury in the Arctic (version May 2025)

AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impacts on Arctic ecosystems and human populations.

This document presents a detailed step-wise plan for implementing AMAP work to address **Mercury in the Arctic** throughout 2025 to 2027. This implementation plan builds on information from related 'one-pager' project activity proposals (see Annex A) that have been developed by the AMAP Mercury Expert Group Leads, with guidance and support from the AMAP tracking HoDs and AMAP Secretariat, and/or from detailed scoping documents, as well as previously approved versions of the plan that covered earlier timeframes¹. Together with other *AMAP implementation plans*² that collectively cover the broad suite of issues within the AMAP mandate, this plan is intended to help advance project-level work under the current [AMAP Work Plan](#) in accordance with the [AMAP Strategic Framework 2019+](#), including its guiding principles and strategic goals, and to provide the AMAP Working Group and wider community with a common understanding of ongoing and planned AMAP activities.

The implementation activities described below will be carried out by the AMAP Expert Group(s) with the support of the AMAP Secretariat, under the direction of AMAP HoDs, and in a manner that is consistent with **current Arctic Council guidelines for resumption of Working Group work**.

These activities will support / contribute to the following AMAP Projects (as per AMAROK):

- Contaminant issues: POPs and mercury;
- Human Health and combined effects;
- Implementing AMAP Contaminant Trends and Effects Monitoring Programme;
- Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC)
- Participation in international workshops, conferences;
- Efforts to engage PPs in AMAP's work.

The key AMAP products and deliverables planned for 2025-2027 in relation to AMAP work to address **Mercury in the Arctic** are:

- Technical reports;
- Summary for Policy-makers (TBC);
- Updated monitoring programme;
- Outreach products, including webinars and outreach at international scientific conferences.

This implementation plan is intended to be updated and presented to the AMAP WG on a biannual basis (approximately June and November), or as needed, as determined by AMAP HoDs.

The AMAP Mercury Expert Group (EG) is co-led by Canada (John Chételat, Environment and Climate Change Canada) and Kingdom of Denmark (Rune Dietz, University of Aarhus), and currently comprises active members from all Arctic nations, 1 Permanent Participant (ICC), 4 Observer

¹ Heads of Delegation of the 8 Arctic Council member states and its 6 Permanent Participants, organizations representing Arctic indigenous peoples.

² Available at: [LINK](#)

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Implementation Plan for AMAP work to address Mercury in the Arctic *(version May 2025)*

nations/organizations (France, Italy, Japan, Netherlands) and others (EC, Portugal). The AMAP Mercury EG is supported by Simon Wilson in the AMAP Secretariat.

A. Background:

Mercury is a global environmental contaminant with both natural sources and sources associated with human activities; much of the mercury contaminating the Arctic is a result of transport by air and ocean pathways from sources outside of the Arctic. Mercury bioaccumulates and biomagnifies in Arctic food chains; this can result in high levels of mercury in top predators such as polar bears and toothed whales. Humans, especially some Indigenous populations that rely on marine mammals as part of their traditional diet, can receive high dietary exposure, raising concerns about possible effects on human health.

Mercury, together with other trace metals including cadmium and lead, were identified as a priority pollution issue in the process that led to the establishment of AMAP in 1991.

AMAP's work on metals, and in particular mercury constitutes a core part of AMAP's activity addressing environmental contaminants that can impact Arctic wildlife and human health. This work is organized under AMAP's Mercury expert group (EG), and is coordinated internally with, in particular, AMAP EGs on POPs and human health, and externally with work under the Arctic Council ACAP WG.

Assessments of mercury (and other trace metals) in the Arctic have been delivered by AMAP in 1998, 2002, 2011, 2018 and most recently in 2021.

In addition to informing the Arctic Council and its member states and Permanent Participants, AMAP assessment and data products concerning mercury provide an important contribution to international processes that address chemicals management and action to reduce environmental pollution. In this respect, AMAP and UNEP (Chemicals Branch) jointly coordinated and implemented technical work to deliver the UN Global Mercury Assessments (GMA) in 2013 and 2018. AMAP experts have historically prepared global inventories of mercury emissions to air from anthropogenic sources, that are geospatially distributed for use in air transport modelling.

AMAP experts contribute to work under the UNEP Minamata Convention on Mercury and the UN ECE Air Convention (Convention on Long-range Transboundary Air Pollution). HoDs have requested AMAP Secretariat to track work under the UNEP Mercury (Fate and Transport) Partnership Area. UNEPs activity to establish a science-policy panel to contribute further to the sound management of chemicals and waste and to prevent pollution (ref. UNEA decision 5.2), and current UN initiatives to link Conventions dealing with climate change, biodiversity and pollution (the triple planetary crisis) are also relevant for AMAP work addressing mercury.

B. AMAP's Mercury implementation plan – Overview of Implementation Activities

AMAP's Mercury implementation plan for 2025-2027 includes six primary activities:

- Updating AMAP trends and effects monitoring programme (ATEMP).
- Implementing (cross-cutting) updating of contaminants time-series analyses.
- Providing relevant Arctic data for use in Minamata Convention effectiveness evaluation.
- Using mercury stable isotopes for understanding mercury sources and transport in the Arctic.
- Scoping Arctic issues around rare-earth elements and green-transition elements.
- Advancing Co-production in implementation activities.

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Implementation Plan for AMAP work to address Mercury in the Arctic (version May 2025)

These activities are carried out in ways that specifically address the AMAP Strategic Goals and Guiding Principles³.

1. Providing relevant Arctic data for use in Minamata Convention (MC) effectiveness evaluation (EE)

Activity leads/contacts:

John Chételat (AMAP Mercury EG co-lead) supported by AMAP Secretariat; AMAP mercury EG members on the Minamata Convention OESG or roster of experts.

Rationale and description:

The Minamata Convention (MC) Article 22, requires Parties to 'evaluate its effectiveness' beginning no later than 6-years after its entry into force (16 August 2017). The Convention has established an Effectiveness Evaluation Group (EEG) to supervise this process and prepare the EE report, as well as an Open-ended Science Group (OESG) which, together with a roster of experts will undertake the related technical work (Ref: MC Decision MC-5/14). AMAP has committed to engage with this process to ensure that Arctic data are included in the MC EE report; results of time-series analyses (see 2, below) and possible work to update information on mercury emissions and releases (globally) are particularly relevant in this connection.

During 2025-2027, AMAP will continue to support the preparation of the Minamata Effectiveness Evaluation through participation of members of the AMAP Mercury EG in the Minamata EE OESG and roster of experts. AMAP will engage with the Minamata Convention Secretariat to discuss possible future collaborative work, including potential outreach at the Minamata COP6, if appropriate.

Progress to-date:

AMAP Mercury EG leads have identified experts that are involved or interested in supporting EE work under relevant Conventions, including individuals that are also members of the OESG or its roster of experts, to function as a possible 'AMAP focus group' for this issue.

Under previous AMAP Work Plans and in connection with the Minamata COP-5 (October/November 2023), AMAP, together with Norway, arranged a virtual side-event, and organized an AMAP/Northern Contaminants Program information booth at the COP-5 meeting, in which AMAP Secretariat and AMAP mercury EG co-Chair (John Chételat, Canada) participated.

A mercury webinar (#4) was organized on 13 February 2024 (recording available) where Manoela Pessoa de Miranda and Eisaku Toda of the Minamata Convention Secretariat outlined the process and plans for the work involved in preparing the Effectiveness Evaluation of the Minamata Convention.

AMAP Secretariat contacted the Swedish Environment Institute (IVL) to re-evaluate the possibilities for work on emissions inventories relative to that outlined in the related [emissions estimates one-pager](#); there was no further follow-up of this activity within Minamata process.

A response to the request issued by the MC Secretariat for submission of relevant data was submitted end-2023 (ref. e-mail from AMAP 16 October 2023). In accordance with procedures established by the Minamata Convention Secretariat/OESG, relevant AMAP data on mercury in human biomedica, air/precipitation and biota have been provided to the Minamata Convention for use in its effectiveness evaluation (ref. e-mails to AMAP HoDs and Minamata national focal points

³ [Link to external table](#)

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Implementation Plan for AMAP work to address Mercury in the Arctic (version May 2025)

from AMAP on 9 July 2024 and simon.wilson on 19 August 2024). To the extent possible, submission of data on mercury in biota was coordinated with national submission to avoid duplication.

AMAP-affiliated mercury experts and AMAP Secretariat join online/hybrid Minamata OESG meetings. At the OESG in-person/hybrid meeting 17-21 March in Minamata, Japan an updated plan for work to draft the OESG report was agreed (aiming to complete this work during the summer). The draft report of the biota sub-group includes an AMAP/Arctic case study based on AMAP 2021 assessment work and a case study on co-produced studies of mercury in beluga in Canada. AMAP experts are participating in several sub-groups responsible for this work.

Plans to schedule an *ad hoc* meeting of AMAP mercury experts engaged in or interested in the work of the OESG to coordinate wider AMAP expert input to the OESG work have not yet been advanced but should be reconsidered following the March OESG meeting. Outcomes of any such discussions could then be fed in to the OESG by experts that are members of the OESG or its 'roster of experts'.

2. Implementing (cross-cutting⁴) updating of contaminants time-series analyses

Activity leads/contacts:

John Chételat and Rune Dietz (AMAP Mercury EG co-leads)

Rationale and description:

AMAP expert groups routinely update information on temporal trends of hazardous substances in Arctic biotic and abiotic media. To date, such work has been performed in connection with major assessments (at ca. 5-years intervals). HoDs have requested that information is updated in a more timely fashion. Under the 2021-2023 workplan it was agreed to undertake such work aiming to produce, e.g., biennial product updates ([one-pager link](#)). These data products underpin both AMAP assessments and work under global Conventions that track the effectiveness of actions to reduce pollution, globally and in the Arctic. The last such update of trends in mercury was undertaken in connection with the AMAP 2021 mercury update assessment (with data to ca. 2018). Harmonized systems are being developed together with OSPAR and HELCOM to assess marine time-series data and make these available via dedicated online assessment portals⁵.

During 2025-2027, AMAP will work towards producing data product on temporal trends of mercury in the Arctic (for example using the HARSAT statistical analysis tool) and incorporating these in the online AMAP contaminant trend assessment results portal, as a resource that will be available for future AMAP assessment work and relevant external processes.

Progress to-date:

The HARSAT tool co-developed by AMAP, HELCOM and OSPAR is now publicly available and a 'user group' is being established to maintain/further develop and apply this tool (linked to NCM project); a HARSAT user group workshop was held 29 April-1 May 2024 (ref. report in [AMAP Info. Brief, July 2024](#)). A follow-up (online) workshop was held 23 September 2024 targeting potential users in North America who were unable to join the workshop in April/May, with ca. 15 participants and positive reactions; a follow-up activity is being planned for spring 2025 to demonstrate use of the HARSAT tool on relevant example datasets.

⁴ To develop and analyze temporal trend data for mercury, POPs/CEACs, SLCFs, etc.

⁵ e.g. apply [HARSAT](#)/OHAT tools and service co-developed by AMAP/HELCOM/OSPAR/ICES, etc.

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Implementation Plan for AMAP work to address Mercury in the Arctic (version May 2025)

To address formalities associated with work arrangements to secure further development and maintenance of the HARSAT tool going forward, AMAP, HELCOM and OSPAR Secretariats have approached their respective managerial bodies (groups, committees, etc.) to present proposals in this regard. With endorsement from AMAP HoDs (HoDs meeting early 2025) a HARSAT User Group has been established that is 'co-sponsored' by all three organizations. This is an informal arrangement with Secretariats of the three organizations coordinating activities of this group to continue the harmonized approach established in the initial HARSAT development work.

AMAP mercury EG leads have continued to arrange webinars addressing topics of interest to the Arctic mercury community, including recent presentations of studies that address the impact of climate change on processes that can effect trends in environmental mercury (ref. [AMAP mercury webinar series](#)).

On an AMAP mercury expert group meeting in August 2024, a project group was identified to accomplish the work to update AMAP temporal trend analyses, and experts invited to register their interest in joining this project group (ref. Mercury EG meeting notes, e-mail from AMAP on 13 September 2024). AMAP Secretariat is coordinating work with national data providers to inventorize time-series data that would be available for inclusion in updated trend analyses work. An open nomination process to invite additional experts to join this activity will be issued in 2025 with practical work now rescheduled during 2025.

3. Updating AMAP trends and effects monitoring programme (ATEMP) ([one-pager link](#))

Activity leads/contacts:

John Chételat and Rune Dietz (AMAP Mercury EG co-leads); AMAP Secretariat

Rationale and description:

AMAP implements a coordinated programme for monitoring contaminants and their effects in the Arctic – the AMAP Trends & Effects Monitoring Programme (ATEMP). The AMAP programme is based largely on national monitoring and research activities. AMAP defines a set of core activities that it encourages countries to adopt as part of their AMAP national implementation plans and conducts work to harmonize monitoring and related activities (data management, etc.), including harmonization with overlapping international monitoring under e.g. EMEP, OSPAR, etc. The AMAP programme also needs to be reviewed in relation to the development of a global mercury monitoring program under the Minamata Convention to ensure appropriate alignment.

The 'guidelines' for monitoring of contaminants under the AMAP Trends & Effects Monitoring Programme last received a comprehensive update in 2004. The AMAP WG has identified updating of the AMAP monitoring programme, to include both consideration of new approaches and methods, a priority activity in its workplan and charged the Secretariat with developing a plan to accomplish this work. Planned work includes reviewing the use of new methods such as stable mercury isotopes ([one-pager link](#)) (see 4, below) in a monitoring context. This activity connects to AMAP's Strategic Goal to enhance engagement of indigenous people in AMAP work as well as work to better integrate cross-cutting aspects addressing contaminants, wildlife health and human health.

During 2025-2027, AMAP will work towards producing an updated (online) resource documenting components of the AMAP trends and effects monitoring programme addressing mercury in the Arctic environment.

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address Mercury in the Arctic (version May 2025)

Progress to-date:

Scoping work to better integrate contaminants wildlife/human health effects monitoring was included at the Sandbjerg consultation workshop arranged by Canada and Denmark (June 2023). Outcomes of that consultation included proposals to prepare four scientific papers that would serve as 'proof-of-concept' for future interdisciplinary AMAP assessment work and products in this integrated framework, as well as proposals to establish 'task teams' to consider new (cross-disciplinary) monitoring approaches and develop a possible AMAP monitoring programme component to address zoonotic diseases. These activities are addressed in a separate AMAP Implementation Plan covering work on Contaminants-Wildlife-Human health.

On an AMAP mercury expert group meeting in August 2024, it was agreed to establish a project group to undertake the work to update the AMAP monitoring programme for mercury (including new methods and approaches), and experts were invited to register their interest in joining this project group (ref. Mercury EG meeting notes, e-mail from AMAP on 13 September 2024). Work on this component has not yet started and has been rescheduled for implementation in 2025.

4. Using Mercury Stable Isotopes for understanding Mercury Sources and Transport in the Arctic ([one-pager link](#)) and Scoping issues around Rare-Earth Elements (REE) and Green-transition Elements (GTEs) ([one-pager link](#))

Activity leads/contacts:

John Chételat and Rune Dietz (AMAP Mercury EG co-leads); Mercury Isotope Scoping Project: members identified; REE/GTEs Scoping Project: pending nominations

Rationale and description:

Mercury stable isotopes ratios are a tool to trace sources and transport pathways of mercury accumulating in Arctic ecosystems. Advances in analytical techniques have made the measurement of mercury stable isotope ratios more broadly accessible, and a number of datasets have now been published on mercury isotopes in the Arctic. Through this activity, AMAP aims to compile existing published and unpublished data on Hg isotopes in Arctic biota and environmental media (e.g., air, seawater, river water, snow). In addition, new measurements of Hg isotopes in Arctic biota may be conducted to broaden the scope of this activity. Sources and biogeochemical processes produce a large range of Hg isotope signatures, and these datasets will allow for an evaluation of key pathways and processes contributing to mercury bioaccumulation in Arctic food webs such as river influence on marine exposure, dry versus wet atmospheric deposition, habitat-specific exposure, and migration patterns. This new activity addresses a recommendation of the AMAP 2021 Mercury Assessment, to continue and expand biomonitoring to improve understanding of key human and wildlife exposure pathways to mercury. AMAP HoDs decided to include scoping work on this issue as part of AMAPs mercury EG implementation plan for work in 2025/26. The scoping activity will produce a technical report with recommendations to AMAP HoDs on possible application of work on mercury isotopes in AMAP monitoring and assessment work.

AMAP has an ongoing mandate to identify new issue of potential Arctic concern. Following completion of its 2021 mercury assessment, the AMAP mercury expert group leads suggested that potential contamination of the Arctic as a result of increasing extraction of REEs/GTEs might be a new issue of concern warranting attention. Demand for REEs is rapidly increasing due to their use in technology including cell phones and electric vehicles. Mineral resources being mined or considered for exploitation in the Arctic include REEs and GTEs. The Mercury EG will undertake a scoping activity on rare earth elements and their possible implications for the Arctic. The scoping

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activity will produce a technical report summarizing available information on REEs/GTEs in the Arctic, to identify knowledge gaps as a basis for further consideration by HoDs of whether this issue needs to be addressed in a more comprehensive manner in AMAPs future work.

During 2025-2027, AMAP will work towards producing technical reports scoping use of mercury isotopes and possible issues associated with REE/GTEs in the Arctic, including recommendations for consideration by AMAP HoDs.

Progress to-date:

Mercury webinars (#2 and #3) organized by AMAP mercury EG members have included presentation and preliminary discussion of the potential use of mercury stable isotopes in interpreting monitoring data.

Mercury Stable isotopes scoping activity: On an AMAP mercury expert group meeting in August 2024, a project group was established to further the work to address the use of mercury stable isotopes for understanding mercury sources and transport in the Arctic, and experts were invited to register their interest in joining this project group (ref. Mercury EG meeting notes, e-mail from AMAP on 13 September 2024). Following a planning meeting in November 2024 an open request for nominations to participate in this work circulated to HoDs (17 January 2025). On a virtual project group meeting 28 January 2025, leads for different components of the scoping work were identified, an outline including the PRQs to be addressed was provisionally agreed, and a timeline for the work in 2025 developed. The report of this meeting was communicated to tracking-HoDs and progress reported during the AMAP HoDs meeting 12 February 2025. Project work is now underway.

REE/GTE scoping activity: An open nomination letter to identify experts to participate in this scoping activity was circulated to HoDs in March 2025. The mercury webinar arranged for 9 April 2025 included an introductory presentation of work in Canada on REEs; AMAP HHAG members were invited to join this webinar. Following this, a process to organize project work, similar to that for scoping mercury isotope studies, will be initiated in May 2025.

5. Co-production of planned implementation activities

Activity leads/contacts:

John Chételat and Rune Dietz (AMAP Mercury EG co-leads); Eva Kruemmel (ICC)

Rationale and description:

AMAP's Strategic Goals and Guiding Principles include inclusive partnership with Arctic Indigenous People in AMAP work, and promoting both co-production of knowledge through early engagement of PPs in AMAP work planning as well as activities such as community-based monitoring. AMAP has voiced its ambition to increase its use of and integration of Indigenous Knowledge in AMAP assessments to better understand Arctic change and its impacts on Arctic communities.

AMAP has a long history of collaborating with Permanent Participants, ICC in particular, to highlight Arctic mercury concerns and coordinate input to the Minamata Convention regarding Arctic mercury issues. This includes associated outreach (e.g., highlighting community involvement in AMAP monitoring programme implementation as a model for such activities under the Minamata Convention; Ref: MC Decision MC-5/1).

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During 2025-2027, AMAP will work towards continuing to determine best practices for introduction of co-production into AMAP mercury monitoring and assessment work, and to implement these to the greatest possible extent.

Progress to-date:

AMAP participated in a 'knowledge lab' organized by ICC-Canada at the Minamata COP-5 meeting where the possible development Arctic-Amazon indigenous people's capacity building initiative was raised.

Discussions on co-production of planned mercury monitoring were initiated at the Sandbjerg workshop and will build also on discussion at venues including the UNFCCC Arctic Regional Workshop in Kirkenes (October 2023) and NCP results workshop (February 2024).

A proposed new project that aims to 'develop guidance on how to meaningfully and appropriately engage Indigenous peoples and use Indigenous Knowledge in AMAP assessments and assessment processes', was approved in principle by AMAP HoDs/PPs but remains to be further developed; once in an implementation phase, it is expected to inform further work on co-production in relation to AMAP mercury assessment work.

AMAP mercury webinar #6 (February 2025) was used to present an example of co-produced work in Canada concerning studies of mercury in beluga. The recording of this webinar is included in the collection available from the [AMAP YouTube playlist](#).

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Implementation Plan for AMAP work to address Mercury in the Arctic (version May 2025)

Implementation activities – Timelines and Tasks					
	January-December 2024	January 2025	February 2025	March 2025	April 2025
Summary for 2025-2027	<p>SUMMARY OF KEY STEPS, AT A GLANCE</p> <p><u>Key Meetings:</u> OESG-17 (14 May 2025); OESG-18 (2 July 2025); OESG-19 (10 September 2025)</p> <p><u>Product(s) Completed:</u> Delivery of AMAP data (based on data used in 2021 assessment); AMAP experts are engaged in OESG work to prepare the draft effectiveness evaluation (EE) report that is due to be circulated for Party and EE Committee review on 1 October 2025</p> <p><u>Outreach Events:</u> The Minamata EE is an external process that will be on the agenda of the Minamata Convention COP6 in Geneva 3-7 November and subsequent COPs; COP6 is a potential outreach opportunity for AMAP</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE</p> <p><u>Call for Nominations:</u> to be circulated in June 2025</p> <p><u>Key Meetings:</u> project group meetings to be arranged as necessary</p> <p><u>Product(s) Completed:</u> Data products (fall 2025); HoDs decision on desired technical report and SPM products for production in 2026 (fall 2025)</p> <p><u>Outreach Events:</u> project group meetings, webinar(s) and conference presentations (fall 2025/spring 2026, timing to be decided)</p> <p><u>National Data Check / Review:</u> Compiled data products (fall 2025)</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE</p> <p><u>Calls for Nominations:</u> to be circulated in June 2025</p> <p><u>Key Meetings:</u> project group meetings to be arranged as necessary</p> <p><u>Product(s) Completed:</u> draft updated monitoring programme component (fall 2025)</p> <p><u>Outreach Events:</u> webinar (timing to be decided)</p> <p><u>National Data Check / Review:</u> HoDs review fall 2026</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE</p> <p><u>Calls for Nominations:</u> on REE scoping: to be circulated in May 2025</p> <p><u>Key Meetings:</u> project group meetings to be arranged as necessary</p> <p><u>Product(s) Completed:</u> technical scoping reports with recommendations for consideration by HoDs (fall 2025/2026)</p> <p><u>Outreach Events:</u> webinars (timing to be decided)</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE</p> <p><u>Product(s) Completed:</u> pending outcomes of proposed new project activity on co-production/Indigenous Knowledge use in AMAP assessment work</p> <p><u>Outreach Events:</u> possible related outreach at COP6 (November 2025)</p>
January 2025					
February 2025	<p><u>Milestones/Products:</u></p> <ul style="list-style-type: none"> Participation in Minamata OESG-16 virtual meeting 				<p><u>Milestones/Products:</u></p> <ul style="list-style-type: none"> Mercury webinar#6 (co-production)
March 2025	<p><u>Milestones/Products:</u></p> <ul style="list-style-type: none"> Participation in Minamata OESG-17 in-person meeting 				
April 2025				<p><u>Milestones/Products:</u></p> <ul style="list-style-type: none"> Mercury webinar#7 (REE introduction) 	

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Implementation Plan for AMAP work to address Mercury in the Arctic (version May 2025)

Implementation activities – Timelines and Tasks					
	<i>Milestones/Products:</i>	<i>Milestones/Products:</i>	<i>Milestones/Products:</i>	<i>Milestones/Products:</i>	<i>Milestones/Products:</i>
May 2025	<ul style="list-style-type: none"> Drafting contributions to OESG report 	<ul style="list-style-type: none"> Secretariat: Organize HARSAT walk-through demo for N. American experts 		<ul style="list-style-type: none"> Mercury stable isotopes project group call (THoDs) Establish REE project group (HoDs/PPs expert nominations) 	
June 2025		<ul style="list-style-type: none"> Secretariat/EG leads: Organize work to compile relevant time-series data sets and apply analysis tools and identify experts to participate in this activity 	<ul style="list-style-type: none"> EG leads/Secretariat: Establish mercury project group and convene project group meeting(s) to organize AMAP programme update activity 		
<ul style="list-style-type: none"> AMAP HoDs/PPs - Implementation plan mid-year review; Facilitate project group meeting(s) – logistics/resources/expert participation 					
July-Dec 2025	<i>Milestones/Products:</i> <ul style="list-style-type: none"> Outreach - Minamata COP6 – November 2025 	<i>Milestones/Products:</i> <ul style="list-style-type: none"> Data products available for national review and then added to AMAP online ‘assessment portal’ HoDs/PPs/EG Leads/Secretariat: Consider whether to develop an AMAP technical report on updated time-series results and/or related input to an AMAP SPM deliverable for 2025 	<ul style="list-style-type: none"> Draft (Hg) monitoring programme update for review by HoDs/PPs. <i>Milestones/Products:</i> Updated AMAP monitoring programme	<i>Milestones/Products:</i> <ul style="list-style-type: none"> Technical scoping report on Hg isotope application with, if relevant, proposals integrated into monitoring programme development’) 	<i>Milestones/Products:</i> Coordinated outreach - Minamata COP6 – November 2025

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address **Mercury in the Arctic** (version May 2025)

Implementation activities – Timelines and Tasks					
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		<u>Milestones/Products:</u> <ul style="list-style-type: none"> Potential technical report and SPM deliverables 			
Jan-Dec 2026				<u>Milestones/Products:</u> <ul style="list-style-type: none"> Technical scoping report on REE/GTEs with recommendations for consideration by HoDs 	
Jan 2026- Dec 2027	<ul style="list-style-type: none"> AMAP HoDs/PPs/EG Leads/Secretariat: Development and delivery of technical reports, possible SPM, updated monitoring programme⁶ 				

⁶ POSSIBLE WRITTEN PROCEDURE TO APPROVE SPM, UPDATED MONITORING PROGRAMME, OUTREACH PLAN AND PRODUCTS, ETC

Annex A: Implementation activity ‘one-pagers’¹

Implementation Activity: Contaminants Time-series Assessment: Updating temporal trends of POPs/CEACs and mercury in air and biota.
Relates to Project(s): Contaminant issues: POPs and mercury; Implementing AMAP Contaminant Trends and Effects Monitoring Programme; Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC)
AMAP Experts: POPS/CEAC EG; Mercury EG
PRSQ: To what extent are levels of contaminants in the Arctic increasing or decreasing?
Rationale: AMAP expert groups conduct routine updating of information on temporal trends of hazardous substances in Arctic biotic and abiotic media. To date such work has been performed in connection with major assessments (at intervals of 5+ years); however, HoDs have requested that information is updated in a more timely fashion. Under the 2021-2023 workplan it was agreed to undertake such work aiming to produce, e.g., biennial product updates. These data products contribute both to AMAP assessments and to work under global Conventions that track the effectiveness of actions to reduce pollution, globally and in the Arctic. The last such update of trends in POPs/CEACS was undertaken in 2014 (with data to ca. 2012); mercury trends currently updated to ca. 2020 can also be readily include in the planned work. Harmonized systems are being developed together with OSPAR and HELCOM to assess marine time-series data and make these available via dedicated online assessment portals.
Short description of tasks: Compile and analyze relevant contaminant time series datasets as input to AMAP products and relevant international processes.
Timing: Work scheduled during 2023 and 2024; one (small) in-person meeting in late summer 2023.
Product(s): Data products (updated time series analyses) that will be incorporated in the online AMAP assessment portal and made available to Convention bodies responsible for Effectiveness Evaluation (EE), and eventual AMAP communications to policy-makers. Time-trends update assessment report
Internal coordination: Identify relevant experts from AMAP POPs/CEAC and Mercury EGs
External coordination: Assessments will utilize the HARSAT data analysis systems currently being developed in a collaboration between AMAP, OSPAR and HELCOM. Engagement with Convention groups responsible for EE work.
Resources: Main resource requirement is national support for engagement of national experts to prepare/contribute relevant data and produce time-trends update assessment report. AMAP Secretariat has received a grant of 400K DKK from NKE to support the ‘AMAP Harmonized Regional Seas Assessment Tool’ and its associated user community that, among other things, will test/further develop the HARSAT systems, and utilize this in assessment work.
Priority: Work prioritized to align with Convention EE timelines. Minamata Convention EE plans are currently being developed; POPs EE work was reported in 2023; compilation of data and information input for the next round is likely to be initiated in 2024.
Issues to be resolved: Acquisition of relevant time series; identification of project team

¹The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex A: Implementation activity ‘one-pagers’¹

Implementation Activity: Updating the programme for monitoring of contaminants under the AMAP Trends & Effects Monitoring Programme, including related documentation
Relates to Project(s): Contaminant issues: POPs and mercury; Human Health and combined effects; Implementing AMAP Contaminant Trends and Effects Monitoring Programme
AMAP Experts: POPs/CEAC EG; Mercury EG; SLCF EG, etc.
PRSQ: What are the sources, levels, trends and effects of environmental contaminants in Arctic air, marine/terrestrial/freshwater environments, and biota including humans?
Rationale: AMAP implements a coordinated programme for monitoring contaminants and their effects in the Arctic – the AMAP Trends & Effects Monitoring Programme (ATEMP). The AMAP programme is based largely on national monitoring and research activities. AMAP defines a set of core activities that it encourages countries to adopt as part of their AMAP national implementation plans and conducts work to harmonize monitoring and related activities (data management, etc.), including harmonization with overlapping international monitoring under e.g. EMEP, OSPAR, etc. The ‘guidelines’ for monitoring of contaminants under the AMAP Trends & Effects Monitoring Programme were originally developed in the 1990s; they were subject to a comprehensive update in 2004 but since then have become outdated, only some parts have been maintained. Documentation is in largely the form of ‘text documents’ and efforts to update materials over the past 10 or more years have not been followed through. The AMAP WG has identified updating of monitoring guidelines as a priority activity in its workplan, and charged the Secretariat with developing a plan to accomplish this work.
Short description of tasks: Modernizing the AMAP contaminants monitoring programme and updating related documentation and guidelines
Timing: Work scheduled during 2023 and 2024.
Product(s): Updated ‘guidance’ established through an online web-based platform, with a focus on updating the descriptions of core monitoring activities and procedures for AMAP implementation with reference to relevant (external) documentation and SOPs, etc. The update would address in particular QA/QC aspects and cover both sampling and laboratory procedures as well as data flow aspects.
Internal coordination: Identify relevant experts from relevant AMAP EGs; Secretariat coordination of input and implementation of (web-based) documentation, etc
External coordination: Coordination with other relevant bodies regarding harmonization of monitoring guidelines and data management systems, etc. (OSPAR, EMEP, etc.)
Resources: Secretariat staff resources; financial resources for web-based solutions and possibly for consultant services to support this work;
Priority: High
Issues to be resolved: Expert engagement and commitment; design of web-based documentation system

¹The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex A: Implementation activity ‘one-pagers’¹

Implementation Activity: Mercury Sources and Transport in the Arctic using Mercury Stable Isotopes
Relates to Project(s): Contaminant issues: mercury; Implementing AMAP Contaminant Trends and Effects Monitoring Programme; Support for International Conventions (Minamata, UN ECE Air)
AMAP Experts: Mercury EG
PRSQ: What are the main sources of mercury contaminating the Arctic?
Rationale: Mercury stable isotopes ratios are a tool to trace sources and transport pathways of mercury accumulating in Arctic ecosystems. Advances in analytical techniques have made the measurement of mercury stable isotope ratios more broadly accessible, and a number of datasets have now been published on mercury isotopes in the Arctic. This new work aims to compile existing published and unpublished data on Hg isotopes in Arctic biota and environmental media (e.g., air, seawater, river water, snow). In addition, new measurements of Hg isotopes in Arctic biota may be conducted to broaden the scope of this activity. Sources and biogeochemical processes produce a large range of Hg isotope signatures, and these datasets will allow for an evaluation of key pathways and processes contributing to mercury bioaccumulation in Arctic food webs such as river influence on marine exposure, dry versus wet atmospheric deposition, habitat-specific exposure, and migration patterns. This new activity addresses a recommendation of the AMAP 2021 Mercury Assessment, specifically to continue and expand biomonitoring to improve understanding of key human and wildlife exposure pathways to mercury and would follow-up information presented in mercury webinars.
Short description of tasks: Compile and analyze relevant data on Hg isotope ratios of Arctic biota and abiotic media as input to AMAP products and relevant international processes.
Timing: Work scheduled during 2024 and 2025.
Product(s): Data products (technical report; potential journal article); AMAP update for policy-makers on Arctic mercury issues; communication to scientific community and relevant international processes (incl. Minamata and OSPAR Conventions)
Internal coordination: Identify relevant experts from AMAP Mercury EGs; engagement of experts from observer countries
External coordination: Engagement with relevant Convention bodies (OSPAR, HELCOM, Minamata)
Resources: Main resource requirement is national support for implementation of monitoring and engagement of national experts to contribute relevant data and prepare technical report.
Priority: Initiate work in 2024 for delivery in 2025/26
Issues to be resolved: Identify project group and assign tasks

¹The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex A: Implementation activity ‘one-pagers’¹

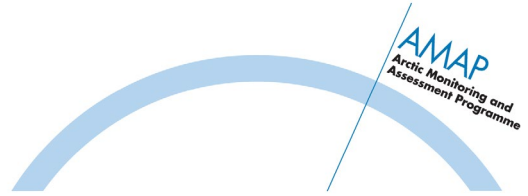
Implementation Activity:
Updating estimates of global emissions of mercury to air from anthropogenic sources
Relates to Project(s):
Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC); Contaminant issues: POPs and mercury
AMAP Experts:
Mercury EG
PRSQ:
Are measures to reduce anthropogenic emissions of mercury globally reducing atmospheric transport and deposition in the Arctic?
Rationale:
To support its assessments of Mercury in the Arctic, AMAP experts produce estimates of global emissions of mercury to air from anthropogenic sources. These inventories have been produced at ca. 5-yearly intervals since 1990; the most recent inventories (for 2010 and 2015) were produced jointly with UNEP as contributions to the 2013 and 2018 UN Global Mercury Assessments (GMAs). These (geospatially distributed) inventories are essential for groups involved in modelling atmospheric transport of mercury to the Arctic (as well as global mercury modelling efforts).
Short description of tasks:
Compile and review relevant data on activity statistics, emission factors, technology, speciation and geospatial distributions (point sources and proxies), etc. to prepare updated geospatially-distributed emissions estimates for 2020 (and potentially revise estimates for years since 2000)
Timing:
Work scheduled during 2023 and 2024; one or two (small) in-person meetings in fall 2023 and spring 2024.
Product(s):
Data products (updated emissions datasets) that will be made available for use by the global scientific community (including use in future AMAP Hg assessments), possible technical report and/or publication. Datasets are made available via the AMAP online mercury project resources; including to the Minamata Convention body responsible for Effectiveness Evaluation (EE), and HTAP modelling community, etc.
Internal coordination:
Involvement of relevant AMAP experts (at IVL-Sweden, ACUG-Netherlands, etc.)
External coordination:
Potential collaboration with IIASA. Engagement with Minamata Convention Secretariat and group responsible for EE work (OESG) and UNEP Chemicals Branch.
Resources:
Main resource requirement is national support for engagement of national experts to prepare/contribute relevant data. IVL has estimated that relevant experts are available to undertake work to compile and review data during 2023 and estimated costs at 20 K EUR depending on extent of work; additional resources would be required for spatial distribution work. Preliminary discussions with UNEP (Chemicals Branch and Minamata Secretariat) have indicated possible interest in co-financing this activity. Preliminary discussions with ACUG (Netherlands) and IIASA have indicated interest in this work.
Priority:
Work prioritized to align with Convention EE timelines. Minamata Convention EE plans are currently being developed; POPs EE work was reported in 2023; compilation of data and information input for the next round is likely to be initiated in 2024.
Issues to be resolved:
If decided, further planning discussions with potential partners (IVL, ACUG, IIASA, UNEP, etc.) including identification of financial resources and scope and timing of work.

¹The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex A: Implementation activity ‘one-pagers’¹

Implementation Activity: Scoping Arctic Issues of Potential Concern: Arctic contamination by rare earth elements/green (energy) transition elements
Relates to Project(s): Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC); Contaminant issues: POPs and mercury
AMAP Experts: Mercury EG
PRSQ: What new/emerging issues of concern for Arctic contamination could arise from REEs/GTRs? In addition to water and soil contamination, extraction of rare earth elements and other green transition elements and metals can also be a source of, e.g., air and noise pollution. To what extent do these activities impact Arctic wildlife and human populations?
Rationale: Rare earth elements (REEs) and green transition elements (GTEs) are contaminants of emerging concern. Limited information is available on baseline concentrations and behaviour of REEs/GTEs in Arctic environments. The aim of this activity would be to summarize available information on REEs/GTEs in the Arctic and identify major knowledge gaps as REE/GTE extraction expands globally, including at mining developments within the Arctic.
Short description of tasks: Compiling and evaluating relevant data on REEs and GTEs in Arctic biota and abiotic media, and other pertinent information as input to an AMAP technical report (scoping white paper) on this topic; this information could also be communicated to other international processes if relevant.
Timing: Work scheduled during 2025 and 2026; one or two (small) in-person meetings in 2025.
Product(s): Scoping document (technical report and potential journal article) to inform AMAP HoDs; eventual AMAP communications to policy-makers. The products of the work would include recommendations for consideration by the AMAP WG. The scoping document will be prepared using existing datasets and published studies, including materials provided by Indigenous Peoples, to address key questions, such as those identified above.
Internal coordination: Involvement of relevant AMAP experts; observers will be invited to provide relevant expertise and knowledge to the scoping process.
External coordination: Potential collaboration with relevant international processes. UNEP work includes efforts to ensure energy transition minerals are fairly and sustainably managed. This work is addressed by the UNEA. UN Chemicals and Waste Management Branch is a potential target for the proposed work.
Resources: Main resource requirement is national support for engagement of national experts to prepare/contribute relevant data and information. AMAP HoDs/PPs would be requested to identify and support engagement of relevant experts in the scoping work.
Priority: Work prioritized to align with AMAP 2025 mercury EG work implementation plan.
Issues to be resolved: Identification of financial resources and timing of work.

¹The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.



Pollution Issue: Persistent Organic Pollutants (POPs) and Chemicals of Emerging Arctic Concern (CEAC)

(version May 2025; approved June 2025)

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address POPs/CEACs in the Arctic (version May 2025)

AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impacts on Arctic ecosystems and human populations.

This document presents a detailed step-wise plan for implementing AMAP work to address **Persistent Organic Pollutants (POPs) and Chemicals of Emerging Arctic Concern (CEAC) in the Arctic** throughout 2025 to 2027. This implementation plan builds on information from related 'one-pager' project activity proposals (see Annex A) that have been developed by the AMAP POPs Expert Group Leads, with guidance and support from the AMAP tracking HoDs and AMAP Secretariat, and/or from detailed scoping documents, as well as previously approved versions of the plan that covered earlier timeframes¹. Together with other *AMAP implementation plans*² that collectively cover the broad suite of issues within the AMAP mandate, this plan is intended to help advance project-level work under the current [AMAP Work Plan](#) in accordance with the [AMAP Strategic Framework 2019+](#), including its guiding principles and strategic goals, and to provide the AMAP Working Group and wider community with a common understanding of ongoing and planned AMAP activities.

The implementation activities described below will be carried out by the AMAP Expert Group(s) with the support of the AMAP Secretariat, under the direction of AMAP HoDs and PPs, and in a manner that is consistent with **current Arctic Council guidelines for resumption of Working Group work**.

These activities will support / contribute to the following AMAP Projects (as per AMAROK):

- Contaminant issues: POPs and mercury;
- Human Health and combined effects;
- Implementing AMAP Contaminant Trends and Effects Monitoring Programme;
- Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC)
- Participation in international workshops, conferences;
- Efforts to engage PPs in AMAP's work.

The key AMAP products and deliverables planned for 2025-2027 in relation to AMAP work to address **POPs/CEAC in the Arctic** are:

- Technical reports (POPs trends data products);
- Scientific assessment report (POPs trends);
- Summary for Policy-makers (Local vs Long-range transported POPs CEACs; POPs trends);
- Updated monitoring programme;
- Outreach at international scientific conferences (POPRC 2025; other TBD).

This implementation plan is intended to be updated and presented to the AMAP WG on a biannual basis (approximately June and November), or as needed, as determined by AMAP HoDs.

The AMAP POPs Expert Group (EG) is co-led by Canada (Derek Muir, Canada), Kingdom of Denmark (Katrin Vorkamp, University of Aarhus) and Sweden (Cynthia deWit and Matthew MacLeod, Stockholm University), and currently comprises active members from all Arctic nations, 1 Permanent

¹ Heads of Delegation of the 8 Arctic Council member states and its 6 Permanent Participants, organizations representing Arctic indigenous peoples.

² [LINK to be inserted](#)

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address POPs/CEACs in the Arctic *(version May 2025)*

Participant (ICC), 10 Observer nations/organizations (China, Germany, Italy, Poland, Republic of Korea, Spain, Switzerland, The Netherlands, United Kingdom) and others (Australia, Czech Republic, EC). The AMAP POPs EG is supported by Simon Wilson in the AMAP Secretariat.

A. Background:

Persistent organic pollutants (POPs) were identified as a priority pollution issue in the process that led to the establishment of AMAP in 1991. AMAP's work on POPs and Chemicals of Emerging Arctic Concern (CEAC) constitutes a core part of AMAP's activities to address environmental contaminants that can impact Arctic wildlife and human health. This work is organized under AMAP's POPs expert group (EG), and is coordinated internally with, in particular, AMAP EGs on mercury, human health, and litter and microplastics, and externally with work under the Arctic Council's Arctic Contaminants Action Programme (ACAP) Working Group.

Assessments concerning POPs and CEACs in the Arctic have been delivered by AMAP in 1998, 2002, 2009, 2015, 2016, 2018 and most recently in 2021³.

In addition to informing the Arctic Council and its member states and Permanent Participants, AMAP assessment and data products concerning POPs and CEAC provide important contributions to international processes that address chemicals management and action to reduce environmental pollution. In this respect, AMAP contributes to work under the UNEP Stockholm Convention on Persistent Organic Pollutants and the UN ECE Air Convention (Convention on Long-range Transboundary Air Pollution), as well as the Convention on Biodiversity. It also relates to UN initiatives, such as the Global Framework on Chemicals (<https://www.chemicalsframework.org/>), UNEP's activity to establish a science-policy panel to contribute further to the sound management of chemicals and waste and to prevent pollution (ref. UNEA decision 5.2), and current UN initiatives to link Conventions dealing with climate change, biodiversity and pollution (the triple planetary crisis) are also relevant for AMAP work addressing POPs/CEACs.

B. AMAP's POPs/CEAC implementation plan – Overview of Implementation Activities

AMAP's POPs/CEACs implementation plan for 2025-2027 includes five primary activities:

- Updating AMAP trends and effects monitoring programme (ATEMP).
- Communication of policy-relevant findings, including findings of work on Local vs LRT sources of POPs and CEACs
- Updating contaminant time-series analyses.
- Providing relevant Arctic data for use in the Stockholm Convention effectiveness evaluation and POPs Review Committee.
- Advancing Co-production in implementation activities.

These activities are carried out in ways that specifically address the AMAP Strategic Goals and Guiding Principles⁴.

³ All AMAP reports are available from <https://www.amap.no/publications>

⁴ [LINK to be inserted](#)

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address POPs/CEACs in the Arctic (version May 2025)

1. Providing relevant Arctic data for use in Stockholm Convention effectiveness evaluation and POPs Review Committee

Activity leads/contacts:

POPs EG co-leads supported by AMAP Secretariat; AMAP POPs EG members on the Stockholm Convention EE Groups and POPs Review Committee (POPRC).

Rationale and description:

The Stockholm Convention (SC) effectiveness evaluations (EE) are conducted at 6-year intervals and AMAP engages with these processes to ensure that Arctic data are included in the SC EE reports; results of time-series analyses (see 2, below) are particularly relevant in this work. AMAP also provides relevant data on contaminants that are being considered by the SC POPs Review Committee (POPRC) for listing under the Convention annexes.

In connection with its work on POPs/CEAC, AMAP also engages with other relevant processes under UNEP, including its Global Framework on Chemicals, and supports the UN ECE Air Convention (on long-range transboundary air pollution, CLRTAP).

As part of its initiative to address the triple planetary crises of climate change, nature and biodiversity loss, and waste and pollution, UNEP has formed an ad hoc Open-ended Working Group (OEWG) to establish a science-policy panel on sound management of chemicals and waste (<https://www.unep.org/oewg-spp-chemicals-waste-pollution>); this work will be tracked by the POPs/CEAC EG.

During 2025-2027, AMAP will continue to support work under the Stockholm Convention by preparing data products and relevant information for use in its next Effectiveness Evaluation process and ongoing work of its POPRC. AMAP will engage with the Basel-Rotterdam-Stockholm Convention Secretariats to discuss possible future collaborative work, including potential outreach.

Progress to-date:

The HARSAT tool co-developed by AMAP, HELCOM and OSPAR is now publicly available (see <https://harsat.amap.no/>) and a 'user group' has been established to maintain/further develop and apply this tool.

Timelines for activities under relevant external bodies (SC EE, SC POPRC, UN OEWG, etc.) are established. Work on the compilation/analysis of data for the Stockholm Convention effectiveness evaluation has been initiated, in part related to the temporal trend assessment work (2).

An outreach event has been arranged by the POPs EG in connection with the 21st meeting of the POPRC (29 September-3 October 2025) where results and recommendations arising from the work on local vs LRT sources of POPs will be presented/communicated (see 4 below).

2. Updating of contaminants time-series analyses ([one-pager link](#))

Activity leads/contacts:

POPs EG co-leads supported by AMAP Secretariat; AMAP POPs EG members identified to lead time-series analysis and/or lead chapters of the trend assessment.

Rationale and description:

AMAP expert groups routinely update information on temporal trends of hazardous substances in Arctic biotic and abiotic media. To date, such work has been performed in connection with major assessments (at intervals of 5+ years). HoDs have requested that information and results of monitoring activities are updated in a more timely fashion and have previously expressed support

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address POPs/CEACs in the Arctic (version May 2025)

for an updated assessment of contaminant time trends. Data products on (statistical) analysis of time-series underpin both AMAP assessments and work under global Conventions that track the effectiveness of actions to reduce pollution, globally and in the Arctic. The last such comprehensive update of temporal trends in POPs/CEAC was undertaken in 2014 (with data to ca. 2012); trends for selected CEACs in air and biota to 2014 were included in the assessment of CEACs (2016) and influences of climate change on long-term POP levels were addressed in the assessment of influences of climate change (2021). Additional data from e.g. environmental archives such as ice cores can be used to supplement the (recent) time-series for air and biota.

Harmonized systems are being developed together with OSPAR and HELCOM to assess marine time-series data and make these available via dedicated online assessment portals, providing updated statistics on POPs/CEAC temporal trends in biota, that can be used in a scientific assessment. Given the variety of CEAC (and their physical-chemical properties) as well as the climate-related dynamics of the physical environment of the Arctic and its ecosystems, it will be relevant to conduct a multimedia time trend assessment of POPs and CEAC, to enhance our understanding of the complex changes of chemicals in the Arctic.

In its most recent assessment, AMAP recommended that temporal trend analytical methods and approaches be further developed to better incorporate and investigate relationships with climate-related parameters and apply these to retrospectively re-analyze trends in existing time-series. Data for POPs/CEAC in air and biota together with Arctic time trend datasets for other matrices can be used in a comprehensive circumarctic temporal-trends scientific assessment across matrices and contaminants, and include links to climate change parameters.

During 2025-2027, an assessment considering multi-compartment POPs/CEAC trends and relationships to possible drivers (sources and climate change, etc.) will be prepared for delivery, in the form of a technical assessment report and SPM, in 2027. During 2025/2026, AMAP will prepare data products and other forms of information based on time-series analyses that will feed into this assessment and also be communicated to the Stockholm Convention for use in its Effectiveness Evaluation process (that has aligned timing) as well as other initiatives (UN ECE Air Convention, incorporation in AMAP data portal, etc.).

Progress to-date:

An 'expression of interest' letter was sent by EG co-leads to members of the AMAP POPs/CEAC expert pool on 19 February 2024 to ask experts about availability of relevant data and interest in participating in a comprehensive POPs/CEAC temporal trends assessment process – responses have been compiled by the EG leads. As of April 2024, ca. 35 experts had expressed their interest to contribute with data and/or to the assessment and writing process.

AMAP POPs EG co-leads arranged a virtual project group 'kick-off' meeting 21 November 2024, with a second virtual meeting 30 January 2025 and a third on 18 March 2025. These meetings resulted in an overview of the data sources that exist for possible analysis/evaluation and a plan to arrange work around contaminant group chapters, as well as identification of experts to lead and contribute to the various sections. A further (hybrid) project group workshop took place 15/16 May 2025 in conjunction with SETAC-Europe to further specify the work plan for this assessment.

3. Updating AMAP trends and effects monitoring programme (ATEMP) ([one-pager link](#))

Activity leads/contacts:

POPs EG co-leads supported by AMAP Secretariat.

Rationale and description:

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Implementation Plan for AMAP work to address POPs/CEACs in the Arctic (*version May 2025*)

AMAP implements a coordinated programme for monitoring contaminants and their effects in the Arctic – the AMAP Trends & Effects Monitoring Programme (ATEMP). The AMAP programme is based largely on national monitoring and research activities. AMAP defines a set of core activities that it encourages countries to adopt as part of their AMAP national implementation plans and conducts work to harmonize monitoring and related activities (data management, etc.), including harmonization with overlapping international monitoring under e.g. EMEP, OSPAR, etc. The 'guidelines' for monitoring of contaminants under the AMAP Trends & Effects Monitoring Programme last received a comprehensive update in 2004.

The AMAP WG has identified updating of AMAP monitoring programme, to include both consideration of new approaches and methods, a priority activity in its workplan and charged the Secretariat with developing a plan to accomplish this work. Planned work includes reviewing the use of new methods for screening for chemicals in a monitoring context, and reviewing implementation of passive samplers in ATEMP. This activity connects to AMAP's Strategic Goal to enhance engagement of indigenous people in AMAP work as well as work to better integrate cross-cutting aspects addressing contaminants, wildlife health and human health. Chemical mixture and non-targeted screening approaches to consider chemicals and their transformation products more holistically are relevant in this context.

During 2025-2027, AMAP will work towards producing an updated (online) resource documenting components of the AMAP trends and effects monitoring programme addressing POPs and CEACs in the Arctic environment. This should also address QA/QC aspects, for example the participation of laboratories involved in AMAP work in the NCP/AMAP interlaboratory study.

Progress to-date:

Work on this component has not yet started and has been rescheduled for implementation in 2025.

Scoping work to better integrate contaminants wildlife/human health effects monitoring was included at the Sandbjerg workshop arranged by Canada and Denmark (May 2023). The Task Team being established under the Contaminants-Wildlife-Human health initiative to work during 2025 to consider new approaches to monitoring and their connections to chemicals management could be particularly relevant to work on POPs/CEACs.

4. Communication of policy-relevant findings, including findings of work on Local vs LRT sources of POPs and CEAC

Activity leads/contacts:

POPs EG tracking HoDs, co-leads and experts, supported by AMAP Secretariat.

Rationale and description:

In 2021, AMAP WG approved an activity under the POPs/CEAC EG to prepare an assessment of the relative importance of local vs long-range transport (LRT) as sources for POPs and CEAC entering the Arctic. This work is of particular significance to the Stockholm Convention POPs Review Committee that evaluates chemicals for addition to the Convention and which uses LRT as a criterion for defining potentially hazardous chemicals as POPs in the environment and significant for northern communities.

During 2025-2027, AMAP will finalize work on scientific journal articles that can be developed into a derivative SPM with associated outreach targeting the Stockholm Convention and Air Convention.

Progress to-date:

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address POPs/CEACs in the Arctic (version May 2025)

Work reviewing local vs LRT sources of POPs and CEAC impacting the Arctic has been implemented through a scientific collaborative process led by AMAP POPs EG co-leads and involving members of the AMAP POPs EG. Scientific journal articles are under preparation for a planned special issue of *Environmental Science: Advances* which will include six review papers as well as papers detailing seven case studies. Currently, two case studies have been published, two articles are accepted and being revised and all others are in late stages of drafting. Articles are due to be completed by fall 2024 or early 2025. AMAP Secretariat has offered technical support for graphical production.

Outreach at scientific conferences: Preliminary findings of this work were presented at a satellite event of the International Conference for Chemistry in the Environment (June 2023)⁵, the Canadian Northern Contaminants Program (NCP) results workshop (Ottawa, February 2024), the Society of Environmental Toxicology and Chemistry (SETAC) Asia-Pacific meeting (Tianjin, China, September 2024), ArcticNet's Arctic Change Conference (Ottawa, December 2024) and SETAC-Europe 2025 (Vienna, 12-15 May 2025). Preliminary findings were also presented at a side event of the SC POP Review Committee in autumn 2023.

The scientific articles⁶ will be reviewed as a basis for the potential development of this policy-relevant communication. As the journal publication work is still ongoing a possible AMAP SPM would be delivered under the Kingdom of Denmark Chairship period.

A proposal has been made to institute a webinar series in September 2025 to present results of the local vs LRT work, with recordings of webinar presentations potentially available for use in an outreach side-event during the 21st meeting of the POPRC (29 September-3 October) to present results and recommendations arising from the work on local vs LRT sources of POPs (see 1 above).

5. Co-production of planned implementation activities

Activity leads/contacts:

POPs EG co-leads and Permanent Participant representatives, supported by AMAP Secretariat.

Rationale and description:

AMAP's Strategic Goals include enhancing engagement of Indigenous People in AMAP work, promoting both co-production of knowledge through early engagement of POPs in AMAP work planning as well as activities such as community-based monitoring and integration of Indigenous Knowledge in AMAP assessments.

During 2025-2027, AMAP will work towards continuing to determine best practices for introduction of co-production into AMAP POPs/CEACs monitoring and assessment work, and to implement these to the greatest possible extent.

Progress to-date:

Discussions on co-production of planned POPs monitoring were initiated at the Sandbjerg workshop and will build also on discussion at venues including the UNFCCC Arctic Regional Workshop in Kirkenes (October 2023) and NCP results workshop (February 2024).

A proposed new project that aims to 'develop guidance on how to meaningfully and appropriately engage Indigenous peoples and use Indigenous Knowledge in AMAP assessments and assessment processes', was approved in principle by AMAP HoDs/PPs but remains to be further developed; once in an implementation phase, it is expected to inform further work on co-production in relation to AMAP mercury assessment work.

⁵ <https://icce2023.com/satellite-events/>

⁶ [Link to be inserted](#)

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address POPS/CEACs in the Arctic (version May 2025)

Implementation activities – Timelines and Tasks					
	Providing relevant Arctic data for use in Stockholm Convention (SC) effectiveness evaluation (EE) and POPs Review Committee (POPRC)	Updating contaminants time-series analyses	Updating AMAP monitoring programme	Communication of policy-relevant findings, including findings of work on Local vs LRT sources of POPs and CEAC	Co-production of planned POPs/CEAC implementation activities
Timing	Tasks	Tasks	Tasks	Tasks	Tasks
January-December 2024	See archived record of implementation work in 2024				
Summary for 2025-2027	SUMMARY OF KEY STEPS, AT A GLANCE <u>Key Meetings:</u> POPRC-21 (29 Sep-3Oct 2025); Stockholm Convention EE meetings (timing to be confirmed) <u>Outreach Events:</u> POPRC-21 side-event	SUMMARY OF KEY STEPS, AT A GLANCE <u>Key Meetings:</u> project group meetings to be arranged as necessary <u>Product(s) Completed:</u> Data products (fall 2025); <u>National Data Check / Review:</u> Compiled data products (fall 2025); Assessment final draft for peer review (June 2026) <u>Outreach Events:</u> Communication of data products to Stockholm Convention EE (end 2025/early 2026)	SUMMARY OF KEY STEPS, AT A GLANCE <u>Calls for Nominations:</u> to be circulated (timing tbd) <u>Key Meetings:</u> project group meetings to be arranged as necessary <u>Product(s) Completed:</u> draft updated monitoring programme component (timing tbd) <u>National Data Check / Review:</u> HoDs review (timing tbd)	SUMMARY OF KEY STEPS, AT A GLANCE <u>Product(s) Completed:</u> scientific journal articles; SPM pending finalization of 'summary' journal article and development of SPM <u>Outreach Events</u> webinars (September 2025) and presentation of recommendations at POPRC (Sep-Oct 2025)	SUMMARY OF KEY STEPS, AT A GLANCE <u>Product(s) Completed:</u> pending outcomes of proposed new project activity on co-production/Indigenous Knowledge use in AMAP assessment work
January 2025		<u>Milestones/Products:</u> Second online workshop; identification of chapter leads/contributors		<ul style="list-style-type: none"> Peer review and publication of remaining scientific journal articles 	
February 2025					
March 2025		<u>Milestones/Products:</u> Third online workshop; identification of chapter leads/contributors			
April 2025					
May 2025		<u>Milestones/Products:</u> Participation of relevant experts in hybrid workshop, with in-			

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address POPS/CEACs in the Arctic (version May 2025)

Implementation activities – Timelines and Tasks					
	Providing relevant Arctic data for use in Stockholm Convention (SC) effectiveness evaluation (EE) and POPs Review Committee (POPRC)	Updating contaminants time-series analyses	Updating AMAP monitoring programme	Communication of policy-relevant findings, including findings of work on Local vs LRT sources of POPs and CEAC	Co-production of planned POPs/CEAC implementation activities
Timing	Tasks	Tasks	Tasks	Tasks	Tasks
		person participation at project group workshop (15-16 May) arranged in connection with SETAC-Europe			
June 2025		<ul style="list-style-type: none"> HoDs review of plans for developing an AMAP assessment report on temporal trends across matrices linking to climate change and food web parameters. 			
July-December 2025	<u>Milestones/ Products:</u> <ul style="list-style-type: none"> Data products available for national review and then added to AMAP online 'assessment portal'; data products available for use in Stockholm Convention EE 	<u>Milestones/ Products:</u> <ul style="list-style-type: none"> Data analyses products 	<ul style="list-style-type: none"> Draft (POPs/CEAC) monitoring programme update for review by HoDs/PPs? <u>Milestones/Products:</u> <ul style="list-style-type: none"> Draft version of the (POPs/CEAC) monitoring update Review and revision of the draft Updated AMAP monitoring programme 	<u>Milestones/Products:</u> Potential SPM deliverable?	
January-June 2026		<u>Milestones/ Products:</u> <ul style="list-style-type: none"> Final draft technical report for peer review 			

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address **POPS/CEACs in the Arctic** (*version May 2025*)

Implementation activities – Timelines and Tasks					
	Providing relevant Arctic data for use in Stockholm Convention (SC) effectiveness evaluation (EE) and POPs Review Committee (POPRC)	Updating contaminants time-series analyses	Updating AMAP monitoring programme	Communication of policy-relevant findings, including findings of work on Local vs LRT sources of POPs and CEAC	Co-production of planned POPs/CEAC implementation activities
Timing	Tasks	Tasks	Tasks	Tasks	Tasks
2026	<ul style="list-style-type: none"> AMAP HoDs/PPs/EG Leads/Secretariat: Development and delivery of technical reports, possible SPM, updated monitoring programme⁷; 				

⁷ POSSIBLE WRITTEN PROCEDURE TO APPROVE SPM, UPDATED MONITORING PROGRAMME, OUTREACH PLAN AND PRODUCTS, ETC

Annex A: Implementation activity ‘one-pagers’¹

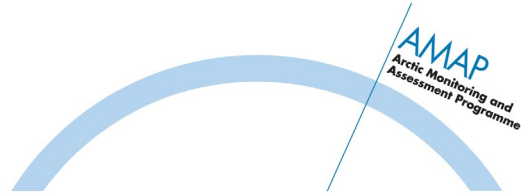
Implementation Activity: Contaminants Time-series Assessment: Updating temporal trends of POPs/CEACs and mercury in air and biota. Comprehensive c temporal trend assessment across multiple matrices and contaminants with links to climate change and food web parameters.
Relates to Project(s): Contaminant issues: POPs/CEACs and mercury; Implementing AMAP Contaminant Trends and Effects Monitoring Programme; Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC).
PRSQ: To what extent are levels of contaminants in the Arctic increasing or decreasing, how do these changes vary between matrices, locations and contaminants (and what can we deduce from these variations), and how is climate change affecting these trends?
Rationale: AMAP expert groups conduct routine updating of information on temporal trends of hazardous substances in Arctic biotic and abiotic media. To date such work has been performed in connection with major assessments (at intervals of 5+ years); however, HoDs have requested that information is updated in a more timely fashion. Under the 2021-2023 workplan it was agreed to undertake such work aiming to produce, e.g., biennial product updates. These data products contribute both to AMAP assessments and to work under global Conventions that track the effectiveness of actions to reduce pollution, globally and in the Arctic. The last such update of trends in POPs/CEACs was undertaken in 2014 (with data to ca. 2012; mercury trends currently updated to ca. 2020 can also be readily include in the planned work. Harmonized systems are being developed together with OSPAR and HELCOM to assess marine time-series data and make these available via dedicated online assessment portals.
Short description of tasks: Compile and analyze relevant contaminant time series datasets as input to AMAP products and relevant international processes.
Timing: Work scheduled during 2024/25.
Product(s): Data products (updated time series analyses) that can be incorporated in the online AMAP assessment portal and made available to Convention bodies responsible for Effectiveness Evaluation (EE); technical products and eventual AMAP communications to policy-makers. Comprehensive time-trends update assessment report(s).
Internal coordination: Identify relevant experts from AMAP POPS/CEAC and Mercury EGs
External coordination: Assessments may utilize the HARSAT data analysis systems currently being developed in a collaboration between AMAP, OSPAR and HELCOM. Engagement with Convention groups responsible for EE work.
Resources: Main resource requirement is national support for engagement of national experts to prepare/contribute relevant data and produce comprehensive time-trends update assessment report. AMAP Secretariat has received a grant of 400K DKK from NKE to support the ‘AMAP Harmonized Regional Seas Assessment Tool’ and its associated user community that, among other things, will test/further develop the HARSAT systems, and utilize this in assessment work.
Priority: Work prioritized to align with Convention EE timelines. Minamata Convention EE plans are currently being developed; POPs EE work was reported in 2023 (including Arctic POPs data to 2019); compilation of data and information input for the next round is likely to be initiated in 2024.
Issues to be resolved: Acquisition of relevant time series; identification of project team

¹The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex A: Implementation activity ‘one-pagers’¹

Implementation Activity: Updating the programme for monitoring of contaminants under the AMAP Trends & Effects Monitoring Programme, including related documentation
Relates to Project(s): Contaminant issues: POPs and mercury; Human Health and combined effects; Implementing AMAP Contaminant Trends and Effects Monitoring Programme
AMAP Experts: POPS/CEAC EG; Mercury EG; SLCF EG, etc.
PRSQ: What are the sources, levels, trends and effects of environmental contaminants in Arctic air, marine/terrestrial/freshwater environments, and biota including humans?
Rationale: AMAP implements a coordinated programme for monitoring contaminants and their effects in the Arctic – the AMAP Trends & Effects Monitoring Programme (ATEMP). The AMAP programme is based largely on national monitoring and research activities. AMAP defines a set of core activities that it encourages countries to adopt as part of their AMAP national implementation plans and conducts work to harmonize monitoring and related activities (data management, etc.), including harmonization with overlapping international monitoring under e.g. EMEP, OSPAR, etc. The ‘guidelines’ for monitoring of contaminants under the AMAP Trends & Effects Monitoring Programme were originally developed in the 1990s; they were subject to a comprehensive update in 2004 but since then have become outdated, only some parts have been maintained. Documentation is in largely the form of ‘text documents’ and efforts to update materials over the past 10 or more years have not been followed through. The AMAP WG has identified updating of monitoring guidelines as a priority activity in its workplan, and charged the Secretariat with developing a plan to accomplish this work.
Short description of tasks: Modernizing the AMAP contaminants monitoring programme and updating related documentation and guidelines
Timing: Work scheduled during 2023 and 2024.
Product(s): Updated ‘guidance’ established through an online web-based platform, with a focus on updating the descriptions of core monitoring activities and procedures for AMAP implementation with reference to relevant (external) documentation and SOPs, etc. The update would address in particular QA/QC aspects and cover both sampling and laboratory procedures as well as data flow aspects.
Internal coordination: Identify relevant experts from relevant AMAP EGs; Secretariat coordination of input and implementation of (web-based) documentation, etc
External coordination: Coordination with other relevant bodies regarding harmonization of monitoring guidelines and data management systems, etc. (OSPAR, EMEP, etc.)
Resources: Secretariat staff resources; financial resources for web-based solutions and possibly for consultant services to support this work;
Priority: High
Issues to be resolved: Expert engagement and commitment; design of web-based documentation system

¹The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.



Pollution Issue: Litter and Microplastics

(version July 2025; approved in June 2025; includes subsequent changes)

AMAP Work Plan Implementation 2025-2027

Implementing AMAP work to address **Litter and Microplastics Pollution** in the Arctic
(Version 1.1 - 17th July 2025)

AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impacts on Arctic ecosystems and human populations.

This document presents a detailed stepwise plan for implementing AMAP work to address **litter and microplastics pollution in the Arctic** throughout 2025 to 2027. This implementation plan builds on information from related 'one-pager' project activity proposals (see Annex A) that were developed by the AMAP Litter and Microplastics Expert Group (LMEG) leads, with guidance and support from the AMAP tracking HoDs and AMAP Secretariat, as well as previously approved versions of the plan that covered earlier timeframes. Together with other AMAP implementation plans that collectively cover the broad suite of issues within the AMAP mandate, this plan is intended to help advance project-level work under the current AMAP Work Plan in accordance with the *AMAP Strategic Framework 2019+¹*, including its guiding principles and strategic goals, and to provide the AMAP Working Group and wider community with a common understanding of ongoing and planned AMAP activities.

The implementation activities described below will be carried out primarily by the AMAP Litter and Microplastics Expert Group (LMEG) with the support of the AMAP Secretariat, under the direction of AMAP HoDs and PPs, and in a manner that is consistent with **current Arctic Council guidelines for resumption of Working Group work**.

These activities will support the following AMAP projects (as per AMAROK):

- Contaminant issues: Arctic Marine Microplastics and Litter;
- Addressing Contaminants and Human Health Issues;
- AMAP Trends and Effects Programme;
- Support for International Conventions;
- Participation in international workshops, conferences; and
- Efforts to engage PPs in AMAP's work.

The key products and deliverables planned for 2025-2027 in relation to AMAP work to address litter and microplastics pollution in the Arctic are:

- Scientific report (*The Effects of Plastic Pollution on Arctic Biota*);
- Summary for Policy-makers (*The Effects of Plastic Pollution on Arctic Biota*. Based on the AMAP scientific report 2025. Released in May 2025);
- A technical report, which would map existing environmental data within prioritised compartments
- A scoping document for consideration by the AMAP WG in 2026 on organising a first comprehensive AMAP assessment on litter and microplastics in the Arctic, most likely in the period 2027-2029
- Recommendations to the AMAP WG on an approach to updating of monitoring guidelines
- Outreach products, including webinars and outreach at international scientific conferences

This implementation plan is intended to be updated on a biannual basis (spring and fall), or as needed, as determined by AMAP HoDs.

¹ <https://www.amap.no/documents/doc/amap-strategic-framework-2019/1802>

AMAP Work Plan Implementation 2025-2027

Implementing AMAP work to address **Litter and Microplastics Pollution** in the Arctic
(Version 1.1 - 17th July 2025)

The AMAP LMEG is co-led by Canada (Jennifer Provencher) and Norway (Eivind Farnen), and currently comprises active members from seven Arctic nations, two Permanent Participants (AIA and ICC), and three Observer nations (France, Germany, and Italy). The AMAP LMEG is supported by Jan Rene Larsen in the AMAP Secretariat.

AMAP Work Plan Implementation 2025-2027

Implementing AMAP work to address **Litter and Microplastics Pollution** in the Arctic
(Version 1.1 - 17th July 2025)

Background

The spread and accumulation of plastic pollution in the Arctic, including from litter and microplastics is an issue of increasing concern for communities and people of the Arctic. The Arctic region may be particularly vulnerable to plastic pollution.

Plastic pollution has also been an issue of increased attention in recent years from the Arctic Council, and specifically from AMAP. The issue was first addressed by the Arctic Council in the AMAP assessment *Chemicals of Emerging Arctic Concern*² (AMAP 2016), and subsequently the PAME (Protection of the Arctic Marine Environment) *Desktop Study on Marine Litter, including Microplastics in the Arctic*³ (PAME 2019) provided a first overview of plastic pollution in the Arctic. The studies acknowledged the limited data and information on this form of pollution in the Arctic and pointed to the need for more work to address the transport, fate, levels, trends and effects of plastic and microplastic in the Arctic environment and ecosystems. Understanding the effects of litter and microplastics in the Arctic and monitoring the changes in their levels over time is important for enabling AMAP to inform policy-makers about potential pollution threats.

AMAP work on litter and microplastics is organized under the AMAP Litter and Microplastics Expert Group (LMEG), and coordinated internally with, in particular, the AMAP Expert Group on Persistent Organic Pollutants, and externally with work under the Arctic Council PAME Working Group. The LMEG was formed in 2019 in response to the need to better understand litter and microplastics in the Arctic environment. It was tasked by AMAP HoDs to: review and assess the status and knowledge of plastic pollution in the Arctic; provide recommendations for developing coordinated pan-Arctic monitoring activities; and promote a harmonized monitoring and standard reporting approach. Collectively, these activities were seen as critical in order to address the concerns of Arctic communities and peoples, and to inform mitigation actions. The Icelandic Chairmanship of the Arctic Council (2019-2021) identified litter and microplastics as a priority for the Arctic Council; the topic was also identified as a priority under the Norwegian Chairmanship of the Arctic Council (2023-2025) and remains a priority for the Kingdom of Denmark during their Chairship from 2025 to 2027.

A phased approach was chosen for LMEG's work. In the first phase (2019-2021), the focus was on developing a monitoring programme for litter and microplastics in the Arctic. In 2021, AMAP published a plan (*AMAP Litter and Microplastics Monitoring Plan*⁴) and guidelines (*AMAP Litter and Microplastics Monitoring Guidelines*⁵) for the environmental monitoring of litter and microplastics. The monitoring guidelines includes an assessment of the state of knowledge and the methods for assessing litter and microplastics in 11 environmental compartments found in the pan-Arctic region. This work also led to a published series of peer-reviewed papers that are *open access* and form a collection in the journal *Arctic Science*⁶ as part of the ongoing efforts to share, collaborate and coordinate with other groups working on this issue.

² <https://www.amap.no/documents/doc/AMAP-Assessment-2016-Chemicals-of-Emerging-Arctic-Concern/1624>

³ <https://pame.is/ourwork/arctic-marine-litter/desktop-study-on-marine-litter/>

⁴ <https://www.amap.no/documents/download/6713/inline>

⁵ <https://www.amap.no/documents/download/6761/inline>

⁶ <https://cdnsiopsciencepub.com/topic/as-litter-microplastics>

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In the second phase of the work by the LMEG (2021-2025) work expanded to include a gap analysis of the effects of litter, microplastics and plastic chemical additives on animals. In 2025, AMAP will publish the scientific report *Effects of Plastic Pollution on Arctic Biota*, which is also addressing effects of plastics additives, and a related Summary for Policy-makers.

AMAP's key publications to date on litter and microplastics in the Arctic include:

- Overview of AMAP Initiatives for Monitoring and Assessment of Plastic Pollution in the Arctic (2021)
- AMAP Litter and Microplastics Monitoring Plan (2021)
- AMAP Litter and Microplastics Monitoring Guidelines. Version 1.0 (2021)
- Summary for Policy-makers: Effects of Plastic Pollution on Arctic Biota (2025)

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AMAP's Litter and Microplastics Implementation Plan – Overview of Implementation Activities

AMAP's Litter and Microplastics Implementation Plan for 2025-2027 includes five primary activities:

1. Preparations for the first full AMAP assessment on plastic pollution in the Arctic (APPol-A)
2. Updating the AMAP monitoring guidelines
3. AMAP support for international fora addressing global plastic pollution issues
4. Engaging Indigenous People in addressing plastic pollution in the Arctic
5. Communicating the findings from the AMAP scientific report, *The Effects of Plastic Pollution on Arctic Biota*.

1. Preparations for the first full AMAP assessment on plastic pollution in the Arctic (APPol-A)

1.1 Rationale and description

In this phase of work (2025-2027), the LMEG will prepare for a larger assessment, potentially for the period 2027-2029. Given that this will be the first full assessment that the LMEG will undertake, the work plan for 2025-2027 focuses on developing a more fulsome understanding of what will be needed to carry out the work potentially for 2027-2029. This will include:

- Status/learning from national implementation of the current monitoring plan and guidelines.
- Creating overviews of data across the four Priority 1 compartments: Beaches/shorelines, sediments (freshwater and marine), water (freshwater and marine), and seabirds. Mapping of existing environmental data within prioritised compartments.
- Creating an overview of existing data on sources and transportation.
- Investigate the effort that it will take to bring these data together. Ongoing conversation on this with the ICES Working Group on Marine Litter, and similar groups under IASC, SPAR, MOEJ, SCAR, SCOR, OSPAR, IMDOS, and PICES.
- Discuss assessment methodology with the above mentioned, including QA/QC of data.
- Work with PPs and experts to explore where PP partners can contribute to the mentioned overviews (see section 2.4 for more details).

Preliminary findings can be presented at the anticipated plastics symposium in Iceland in 2026. A 2-day workshop is planned in 2026, and support for experts' participation in the workshop is anticipated.

A full assessment could involve a full review of the eleven compartments in relation to their priority status for temporal and spatial trend monitoring. For example, the current monitoring plan identifies Priority 1 and 2 compartments for monitoring. Indicators within these compartments met a set of criteria that was outlined in the monitoring plan developed in 2021. In the assessment phase in 2027-2029, LMEG would examine the progress in the compartments, and evaluate how compartments currently listed as a Priority 2, may be moved to Priority 1, or if any Priority 3 compartments may be moved to a higher priority.

The LMEG will create an overview in 2025-2027 for Priority 1 compartments: Beaches/shorelines, sediments (freshwater and marine), water (freshwater and marine), and seabirds.

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The outcome of the work includes a scoping document for consideration by the AMAP WG in 2026 on organising a first comprehensive AMAP assessment on litter and microplastics in the Arctic, most likely in the period 2027-2029

1.2 Progress to-date

During the preparation of the *AMAP Litter and Microplastics Monitoring Guidelines* (2021), the LMEG produced a series of overview maps of the sampling for selected compartments.

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2. Updating the AMAP monitoring guidelines

2.1 Rationale and description

This activity will build on the work carried out by LMEG throughout 2019-2021, which resulted in the development and delivery of a monitoring programme for litter and microplastics in the Arctic in 2021. This included a series of technical documents that outlined methods for collecting samples and producing data on litter and microplastics across 11 compartments. While this work was based on existing and harmonized methods when possible, there are several environmental compartments where method development was still in the early stages.

This activity will formulate recommendations on the need to update the technical method guidelines, based on these themes:

- What are the status and lessons learned from national implementation of the current monitoring guidelines? For example, are there some approaches that are not applicable to the Arctic region?
- Are there learnings from the effects analysis that merits updates to the monitoring plan or guidelines?
- Is there new information on the need to monitor and understand risks in the Arctic, including information related to Indigenous priorities?

This work will be foundational for work that will be undertaken in the 2027-2029 phase, including considering the following:

- Re-evaluating the prioritisation of compartments to provide.
- Is there a need to update the technical components of the guidelines?
- Can the current guidance be updated to reflect the development of the principles for the management of monitoring data that have been developed since the guidelines were published?

The questions will be discussed at the proposed workshop in 2026. Recommendations will be formulated and submitted for discussion at AMAP WG meeting in autumn 2026.

It should be noted that the direction from the AMAP HoDs was that guidelines should have 'time to work' before they are updated. Therefore, this phase of work will work with the LMEG experts to assess not only what new methods may be available, but also the maturity of any new approaches within the field that would warrant a future updating of the technical guidelines.

The main outcome/deliverable of this work will be the formulation of recommendations on the need to update the technical method guidelines.

2.2 Progress to-date

A brief national reporting on the implementation of the monitoring guidelines was organised at an expert workshop in 2023. There is continuous dialogue with ICES on data reporting. Current focus from their side is on the reporting of litter from fish trawling, while biota has lower priority.

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3. AMAP support for international fora addressing global plastic pollution issue

3.1 Rationale and description

One of AMAP's strategic goals is to support relevant international processes. Results from the AMAP assessments are reported to the Arctic Council and governments of Arctic and Observer states as well as to relevant international organizations and processes that use AMAP results in their work.

The UNEP Intergovernmental Negotiating Committee (INC) is in the process of developing an international legally binding instrument on plastic pollution, including in the marine environment. AMAP will continue to follow the development of the instrument and ideally inform the development process. With its current activities, AMAP is ahead of the curve with regards to monitoring plastics in the environment and providing input into policy-making. AMAP's contributions to other pollution-related conventions (e.g. Stockholm Convention on POPs, Minamata Convention on Mercury) have been through assessment work that contributes to the evaluation of the effectiveness of the policy instruments, and AMAP will be well-positioned to do the same with respect to an anticipated plastics treaty.

The *Implementation Plan for the Regional Action Plan on Marine Litter in the Arctic* (ML-RAP) stipulates regular reporting on Arctic Council Working Group activities. LMEG will prepare AMAP's contributions to this.

Key questions for AMAP to address during the period of 2025-2027 are:

- What are the main contents and needs of the INC, and how can they be related to AMAP's overall goals?
- Will there be INC goals which need the development of new monitoring/indicators?
- Are there developments in the implementation of the Marine Litter Regional Action Plan (ML-RAP) in the period that AMAP should address?

There are also other groups working on litter and microplastics monitoring, including ICES in the North Atlantic and PICES in the North Pacific, which have overlapping geographies with AMAP. Given the ongoing ICARP IV planning process for the next International Polar Year, there are also overlapping interests on litter and microplastics with SCAR. Thus, LMEG will work to coordinate work in this area through its members who also have seats in these related organisations.

3.2 Progress to-date

The AMAP Secretariat and the LMEG have followed the INC negotiations, and ICC is directly involved in the process. An Arctic and Indigenous Peoples focused side event was organised in the context of INC-4 in April 2024 in Ottawa, Canada. INC-5 in autumn 2024 was not successful in producing the final treaty text, and another INC (5.2) has been scheduled to take place in August 2025, with the hope that this meeting will result in an agreed treaty text.

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4 Engaging Indigenous People in addressing plastic pollution in the Arctic

4.1 Rationale and description

A pillar of work with the Arctic Council is engagement of Indigenous partners, that is, the Permanent Participants (PPs), and utilization of Indigenous Knowledge and Ways of Knowing throughout the Council's work. The AMAP Expert Groups are encouraged to engage with the PPs as a way to ensure that Indigenous Ways of Knowing are utilized throughout their work.

LMEG would like to have a more meaningful approach to increasing the Indigenous engagement in the group and its activities. Similar to the technical work, the work will take a phased approach that will support LMEG members to engage with PP participants, including undertaking some foundational work that will allow a broader understanding of Indigenous Ways of Knowing. Thus, the phase 2025-2027 will focus on education and training of the membership of LMEG.

4.2 Progress-to-date

In its early years (Phase I), the LMEG had Indigenous experts, nominated by the PPs, among its membership, but those members have decided that the highly technical scientific nature of the LMEG discussions was not the ideal place for their effort at the time. The LMEG co-chairs and the Tracking HODs have discussed what next steps could include to better prepare LMEG members to undertake this work. The following plan has been proposed.

The work that the LMEG can undertake in the period 2025-2027 may include the following:

- Development of a LMEG positionality statement guided by existing examples.
- Informational presentations (proposed to occur quarterly) to the LMEG about Indigenous Ways of Knowing from Indigenous scholars from the Arctic and other regions. This may include:
 - Discussions on the new database from the Government of Canada - Bridging Indigenous and Science-Based Knowledge (BIAS-K) - [Bridging Indigenous and Science-Based Knowledge \(BIAS-K\)](#)
 - Presentations about co-developed plastic pollution projects from the Arctic region, and other regions
 - Presentation from scholars about the importance of firm and explicit space for non-Western sciences and knowledges
 - Presentations from Indigenous scholars on Indigenous methodologies, including facilitated discussions (like talking circles), "what we heard" reports, storytelling (IK), Elder addresses, being on the land together, collaborative editing, community peer-review, and other modes of verbal, collective, and equal input (e.g. The Centre for Wise Practices in Toronto has expertise in these modes, as do other Indigenous organizations that focus on research).
 - Presentation about how Code of Ethics/Conduct that recognizes Indigenous Ways of Knowing have been developed by other groups in relation to plastic pollution and contaminants data.
 - Showcasing of story map that share of community-driven programs around plastic pollution
- Development of a report from LMEG that discusses Community-Based Monitoring for litter and microplastics in the Arctic, and how this has similarities and differs from Indigenous Ways of Knowing.
- Creation of a dedicated sub-group within LMEG to dive into what appropriate and meaningful

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engagement of Indigenous Peoples looks like for LMEG now and in the future. This would discuss a process to include Indigenous participation throughout the assessment process, through the development of a framework for meaningful and equitable Indigenous engagement, including guidelines / code of conduct for work on plastic pollution.

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5 Scientific report on effects on biota (gap analysis) / Communication of results

5.1 Rationale and description

A guiding principle for AMAP is *Knowledge Mobilization*, and a strategic goal is *Effective communication on Arctic challenges and global implications*⁷. In addition to publishing the scientific report and the associated Summary for Policy-makers in summer 2025, there are considerations to publish the findings in the scientific report as journal articles. It is believed that the third plastics symposium will be held in Iceland 2026, and this will be an opportunity to organize sessions and presentations.

5.2 Progress-to-date

There was a press release and social media releases for the SPM in May 2025. The scientific report and the SPM was the subject of a webinars on 25th June 2025. The one-pager (below) lists other already undertaken activities.

⁷ <https://www.amap.no/documents/doc/amap-strategic-framework-2019/1802>

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Implementation activities – Timelines and Tasks					
Timing	Assessment preparations	Updating monitoring guidelines	AMAP support for international fora addressing global plastic pollution issue	Further engagement with Indigenous partners	Communication of SPM / Technical report
May 2025	Confirm membership and leadership of Expert Group on the key activities for 2025-2027 and identify gaps: Arctic Council nations, PPs, Observers				Press release to be issued Presentation deck to be prepared for use, as needed, by HoDs and Experts Social media release(s)
June-Dec 2025	Compiling information and data from nations / national sources; Compiling information from the mentioned organisations		UN-INC5.2 Meeting, August 2025		Webinar Preparing journal articles based on scientific report (TBD) Presentation at ArcticNet Annual Science Meeting (Calgary, Canada) – TBC Translation of SPM into other languages
Summer 2025				First quarterly Indigenous scholar presentation to LMEG	

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Implementation activities – Timelines and Tasks					
Timing	Assessment preparations	Updating monitoring guidelines	AMAP support for international fora addressing global plastic pollution issue	Further engagement with Indigenous partners	Communication of SPM / Technical report
	Presentation of Implementation Plan at AMAP WG meeting (June 2025 (TBC)) and presentation of progress to date (Fall 2025)				
Fall 2025				Second quarterly Indigenous scholar presentation to LMEG	
Dec 2025 - April 2026	Synthesizing compiled information				
Winter 2026				Third quarterly Indigenous scholar presentation to LMEG	
Spring 2026				Fourth quarterly Indigenous scholar presentation to LMEG	
May-June 2026	Discuss and refine synthesis at a physical workshop; Formulate scoping document	Discuss at physical workshop	Discuss at physical workshop		
Summer 2026				Fifth quarterly Indigenous scholar presentation to LMEG Start the process developing a LMEG positionality statement	
September 2026	Presenting scoping document at WG meeting. Discuss next steps with the WG. This will allow for planning of work Winter 2026-				

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Implementation activities – Timelines and Tasks					
Timing	Assessment preparations	Updating monitoring guidelines	AMAP support for international fora addressing global plastic pollution issue	Further engagement with Indigenous partners	Communication of SPM / Technical report
	Spring 2027				
Fall 2026	TBD			Sixth quarterly Indigenous scholar presentation to LMEG	Session and presentation at anticipated plastics symposium (TBC)
Winter 2027				Seventh quarterly Indigenous scholar presentation to LMEG	
Spring 2027				Eight quarterly Indigenous scholar presentation to LMEG	

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3 'One-pagers'

Implementation Activity 1: Preparations for the first full AMAP assessment on plastic pollution in the Arctic (APPoI-A)
Relates to Project(s): Contaminant issues: Litter and microplastics
AMAP Experts: LMEG
PRSQ: Are measures to reduce pollution with litter and microplastics globally reducing transport and deposition in the Arctic?
<p>Rationale:</p> <p>In this phase of work (2025-2027), the LMEG will prepare for a larger assessment, potentially for the period 2027-2029. Given that this will be the first full assessment that the LMEG will undertake, the work plan for 2025-2027 focuses on developing a more fulsome understanding of what will be needed to carry out the work potentially for 2027-2029.</p> <p>Preliminary findings can be presented at the anticipated plastics symposium in Iceland in 2026. A 2-day workshop is planned in 2026, and support for experts' participation in the workshop is anticipated.</p>
<p>Short description of tasks:</p> <ul style="list-style-type: none">• Status/learning from national implementation of the current monitoring plan and guidelines.• Creating overviews of data across the four Priority 1 compartments: Beaches/shorelines, sediments (freshwater and marine), water (freshwater and marine), and seabirds. Mapping of existing environmental data within prioritised compartments.• Creating an overview of existing data on sources and transportation.• Investigate the effort that it will take to bring these data together. Ongoing conversation on this with the ICES Working Group on Marine Litter, and similar groups under IASC, SPAR, MOEJ, SCAR, SCOR, OSPAR, IMDOS, and PICES.• Discuss assessment methodology with the above mentioned, including QA/QC of data.• Work with experts to explore where PP partners can contribute to the mentioned overview.
<p>Timing</p> <ul style="list-style-type: none">• Confirm membership and leadership of Expert Group on the key activities for 2025-2027 and identify gaps: Arctic Council nations, PPs, Observers• June-Dec 2025:<ul style="list-style-type: none">○ Compiling information and data from nations / national sources○ Compiling information from the mentioned organisations• Dec 2025-April 2026: Synthesizing compiled information• May-June 2026: Discuss and refine synthesis at a physical workshop. Formulate scoping document• September 2026: Presenting scoping document at WG meeting. Discuss next steps with the

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WG. This will allow for planning of work Winter 2026-Spring 2027.
Product(s): A scoping document for consideration by the AMAP WG in 2026 on organising a first comprehensive AMAPan assessment on litter and microplastics in the Arctic, most likely in the period 2027-2029
Internal coordination: Involvement of relevant AMAP experts.
External coordination: Potential collaboration with CAFF and PAME. Ongoing coordination with ICES, PICES and SCAR.
Resources: Main resource requirement is national support for engagement of national experts to prepare/contribute relevant data, including the described physical workshop.
Issues to be resolved: (Void)

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Implementation Activity 2: Updating the AMAP monitoring guidelines
Relates to Project(s): Contaminant issues: Litter and microplastics
AMAP Experts: LMEG
PRSQ: Are measures to reduce pollution with litter and microplastics globally reducing transport and deposition in the Arctic?
<p>Rationale:</p> <p>This activity will build on the work carried out by LMEG throughout 2019-2021, which resulted in the development and delivery of a monitoring programme for litter and microplastics in the Arctic in 2021. This included a series of technical documents that outlined methods for collecting samples and producing data on litter and microplastics across 11 compartments. While this work was based on existing and harmonized methods when possible, there are several environmental compartments where method development was still in the early stages.</p>
<p>Short description of tasks:</p> <p>This activity will formulate recommendations on the need to update the technical method guidelines, based on these themes:</p> <ul style="list-style-type: none">• What are the status and lessons learned from national implementation of the current monitoring guidelines? For example, are there some approaches that are not applicable to the Arctic region?• Are there learnings from the effects analysis that merits updates to the monitoring plan or guidelines?• Is there new information on the need to monitor and understand risks in the Arctic, including information related to Indigenous priorities? <p>This work will be foundational for work that will be undertaken in the 2027-2029 phase, including considering the following:</p> <ul style="list-style-type: none">• Re-evaluating the prioritisation of compartments to provide.• Is there a need to update the technical components of the guidelines?• Can the current guidance be updated to reflect the development of the principles for the management of monitoring data that have been developed since the guidelines were published?
<p>Timing:</p> <ul style="list-style-type: none">• May 2025: Confirm membership and leadership of Expert Group on the key activities for 2025-2027 and identify gaps: Arctic Council nations, PPs, Observers• May-June 2026: Discuss at physical workshop• September 2026: Presenting overviews and recommendations at WG meeting. Discuss next steps with the WG. This will allow for planning of work

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winter 2026-Spring 2027
Product(s): Recommendations will be formulated and submitted for discussion at AMAP WG meeting in autumn 2026.
Internal coordination: Involvement of relevant AMAP experts.
External coordination: Ongoing coordination with ICES.
Resources: Main resource requirement is national support for engagement of national experts to prepare/contribute relevant data, including the described workshop.
Issues to be resolved: (Void)

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Implementation Activity 3: AMAP support for international fora addressing global plastic pollution issue
Relates to Project(s): Contaminant issues: Litter and microplastics
AMAP Experts: LMEG
PRSQ: Are measures to reduce pollution with litter and microplastics globally reducing transport and deposition in the Arctic?
<p>Rationale:</p> <p>One of AMAP's strategic goals is to support relevant international processes. Results from the AMAP assessments are reported to the Arctic Council and governments of Arctic and observer states as well as to relevant international organizations and processes that use AMAP results in their work.</p> <p>The UNEP Intergovernmental Negotiating Committee (INC) is in the process of developing an international legally binding instrument on plastic pollution, including in the marine environment (INC). AMAP will continue to follow the development of the instrument and ideally inform the development process. With its current activities, AMAP is ahead of the curve with regards to monitoring plastics in the environment and providing input into policy-making. AMAP's contributions to other pollution-related conventions (e.g. Stockholm Convention on POPs, Minamata Convention on Mercury) have been through assessment work that contributes to the evaluation of the effectiveness of the policy instruments, and AMAP will be well-positioned to do the same with respect to an anticipated plastics treaty.</p> <p>The <i>Implementation Plan for the Regional Action Plan on Marine Litter in the Arctic</i> (ML-RAP) stipulates regular reporting on Arctic Council Working Group activities. LMEG will prepare AMAP's contributions to this.</p>
<p>Short description of tasks:</p> <p>Key questions for AMAP to address during the period of 2025-2027 are:</p> <ul style="list-style-type: none">• What are the main contents and needs of the INC, and how can they be related to AMAP's overall goals?• Will there be INC goals, which need the development of new monitoring/indicators?• Are there developments in the implementation of the Marine Litter Regional Action Plan (ML-RAP) in the period that AMAP should address?
<p>Timing:</p> <ul style="list-style-type: none">• May 2025: Confirm membership and leadership of Expert Group on the key activities for 2025-2027 and identify gaps: Arctic Council nations, PPs, Observers• August 2025: UN-INC5.2 Meeting• May-June 2026: Discuss at physical workshop• September 2026: Presenting overviews and recommendations at WG meeting. Discuss next steps with the WG. This will allow for planning of work Winter 2026-Spring 2027

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Product(s): Recommendations will be formulated and submitted for discussion at AMAP WG meeting in autumn 2026.
Internal coordination: Involvement of relevant AMAP experts.
External coordination: Potential collaboration with CAFF and PAME. Ongoing coordination with ICES, PICES and SCAR.
Resources: Main resource requirement is national support for engagement of national experts to prepare/contribute relevant data, including the described workshop.
Issues to be resolved: (Void)

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Implementation Activity 4: Improving Indigenous engagement
Relates to Project(s): Engaging Indigenous People in addressing plastic pollution in the Arctic
AMAP Experts: LMEG, Invited Indigenous experts/scholars
PRSQ: How can AMAP, through the membership and work of its Expert Groups, build and demonstrate the engagement of PPs, Indigenous Peoples, and Indigenous ways of knowing?
<p>Rationale:</p> <p>A pillar of work with the Arctic Council is engagement of Indigenous partners, that is, the Permanent Participants (PPs), and utilization of Indigenous Knowledge and Ways of Knowing throughout the Council's work. The AMAP Expert Groups are encouraged to engage with the PPs as a way to ensure that Indigenous Ways of Knowing are utilized throughout their work.</p> <p>LMEG would like to have a more meaningful approach to increasing the Indigenous engagement in the group and its activities. Similar to the technical work, the work will take a phased approach that will support LMEG members to engage with PP participants, including undertaking some foundational work that will allow a broader understanding of Indigenous Ways of Knowing. Thus, the phase 2025-2027 will focus on education and training of the membership of LMEG.</p>
<p>Short description of tasks:</p> <p>The work that the LMEG can undertake in the period 2025-2027 may include the following:</p> <ul style="list-style-type: none">● Development of a LMEG positionality statement guided by existing examples.● Informational presentations (proposed to occur quarterly) to the LMEG about Indigenous Ways of Knowing from Indigenous scholars from the Arctic and other regions. This may include:<ul style="list-style-type: none">○ Discussions on the new database from the Government of Canada - Bridging Indigenous and Science-Based Knowledge (BIAS-K) - Bridging Indigenous and Science-Based Knowledge (BIAS-K)○ Presentations about co-developed plastic pollution projects from the Arctic region, and other regions○ Presentation from scholars about the importance of firm and explicit space for non-Western sciences and knowledges○ Presentations from Indigenous scholars on Indigenous methodologies, including facilitated discussions (like talking circles), "what we heard" reports, storytelling (IK), Elder addresses, being on the land together, collaborative editing, community peer-review, and other modes of verbal, collective, and equal input (e.g. The Centre for Wise Practices in Toronto has expertise in these modes, as do other Indigenous organizations that focus on research).○ Presentation about how Code of Ethics/Conduct that recognizes Indigenous Ways of Knowing have been developed by other groups in relation to plastic pollution and contaminants data.○ Showcasing of story map that share of community-driven programs around plastic pollution● Development of a report from LMEG that discusses Community-Based Monitoring for litter and microplastics in the Arctic, and how this has similarities and differs from Indigenous Ways of Knowing.● Creation of a dedicated sub-group within LMEG to dive into what appropriate and meaningful

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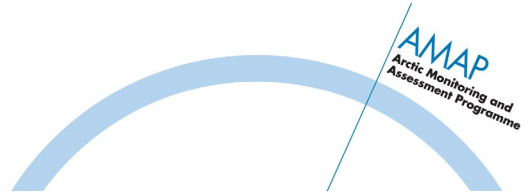
engagement of Indigenous Peoples looks like for LMEG now and in the future. This would discuss a process to include Indigenous participation throughout the assessment process, through the development of a framework for meaningful and equitable Indigenous engagement, including guidelines / code of conduct for work on plastic pollution.
Timing: <ul style="list-style-type: none">• May 2025: Confirm membership and leadership of Expert Group on the key activities for 2025-2027 and identify gaps: Arctic Council nations, PPs, Observers• Summer 2025-Winter 2027: Quarterly Indigenous scholar presentation to LMEG• Spring 2026: Start the process of the development of a LMEG positionality statement
Product(s): <ul style="list-style-type: none">• An LMEG positionality statement• A report that discusses Community Based Monitoring for litter and microplastics in the Arctic, and how this has similarities and differs from Indigenous Ways of Knowing
Internal coordination: Involvement of relevant AMAP experts.
External coordination: (Void)
Resources: Main resource requirement is national support for engagement of national experts.
Issues to be resolved: (Void)

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5. Implementation Activity: Scientific report on effects on biota / Communication of results
Relates to Project(s): Contaminant issues: Litter and microplastics
AMAP Experts: LMEG
PRSQ: What are the gaps in the understanding of the effects of plastic pollution on Arctic animals
<p>Outreach and communication:</p> <p>The scientific report and the associated Summary for Policy-makers (SPM) was/will be published in summer spring 2025. Outreach and communication activities include:</p> <ul style="list-style-type: none">• There are considerations to publish the findings in the scientific report as journal articles.• PAME workshop on fishing gear (ALDFG) in the Netherlands, autumn 2025.• It is believed that the third plastics symposium will be held in Iceland 2026: Organize sessions and presentations. <p>Already organised outreach includes:</p> <ul style="list-style-type: none">• A press release and social media releases for the SPM• The scientific report and the SPM was the subject of a webinars on 25th June 2025. There are considerations on engaging Observers, and there could be another webinar in collaboration with one or more of these.• Presentation: 5.-9.5. ICES Working group Marine Litter (WGML). Presentation 'Plastic pollution in the Arctic' - International seminar on marine littering in the Barents region, 24th October 2024, Tromsø, Norway.• Arctic Circle, January 2025: AMAP was a co-organiser of a side event at the Arctic Youth Conference: "Community- Based Monitoring in the Arctic". A presentation by Destiny Kushin of AIA was focused on a community-driven environmental monitoring program on St. Paul Island on litter and plastics.• Interview with Bloomberg.



Pollution Issue: Radioactivity in the Arctic

(version July 2025; approved in June 2025; includes subsequent changes)

AMAP Workplan Implementation 2025-2027

Implementing AMAP work to address Radioactivity in the Arctic

(Version 1.1 - 17th July 2025)

AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impacts on Arctic ecosystems and human populations.

This document presents a detailed plan for implementing AMAP work to address **Radioactivity Pollution in the Arctic** throughout 2025 to 2027. This implementation plan builds on the scientific and policy recommendations emerging from the most recent AMAP Assessment of Radioactivity in the Arctic (2025), and is primarily focused on laying the foundations for, and scoping future assessment work. Together with other *AMAP implementation plans*¹ that collectively cover the broad suite of issues within the AMAP mandate, this plan is intended to help advance project-level work under the current [AMAP Work Plan](#) in accordance with the [AMAP Strategic Framework 2019+](#), including its guiding principles and strategic goals, and to provide the AMAP Working Group and wider community with a common understanding of ongoing and planned AMAP activities.

The implementation activities described below will be carried out primarily by the AMAP Radioactivity Expert Group with the support of the AMAP Secretariat, under the direction of AMAP Heads of Delegation (HoDs) and Permanent Participants (PPs), and in a manner that is consistent with **current Arctic Council guidelines for resumption of Working Group work**.

These activities will support / contribute to the following AMAP Projects (as per AMAROK):

- Contaminant issues: Radioactivity;
- Human Health and combined effects;
- Participation in international workshops, conferences;

The key AMAP products and deliverables planned for 2025-2027 in relation to AMAP work to address **Radioactivity in the Arctic** are:

- Scientific assessment report (AMAP Assessment 2025: Radioactivity in the Arctic – 2025);
- Summary for Policy-makers for the AMAP Assessment 2025: Radioactivity in the Arctic (Released in May 2025);
- 1st draft of a scoping document for the next AMAP Assessment on Radioactivity in the Arctic
- Process/platform for bringing together data from monitoring stations (TBC)
- Outreach at international scientific conferences (TBD).

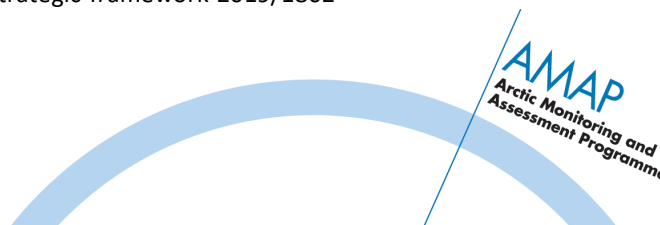
This Implementation Plan is intended to be updated and presented to the AMAP WG on a biannual basis (approximately June and November), or as needed, as determined by AMAP HoDs.

The AMAP Radioactivity Expert Group (EG) is co-led by Ingar Amundsen (Norway), Margarita Katkova (Russia), and Amanda Anderson (USA, and currently comprises active members from eight Arctic nations, and two Observer nations/organizations (Poland and the Netherlands). The AMAP Radioactivity EG is supported by Jan Rene Larsen in the AMAP Secretariat.

A. Background

Radioactivity was identified as a priority pollution issue in the process that led to the establishment of AMAP in 1991. Radioactivity in the Arctic comes from both man-made and naturally occurring radionuclides. Exposure to radioactivity can damage living tissues and organs. How radionuclides

¹ <https://www.amap.no/documents/doc/amap-strategic-framework-2019/1802>



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behave in the Arctic is changing, as a result of climate change, while potential new sources of radionuclides could threaten the region's vulnerable environment, the people who live there and their traditional livelihoods.

AMAP's work on radioactivity constitutes a core part of AMAP's activities to address environmental contaminants that can impact Arctic wildlife and human health. This work is organized under AMAP's Radioactivity Expert Group (EG), and is coordinated externally with work under the Arctic Council's EPPR Working Group.

AMAP has published assessments of radioactivity in the Arctic in 1998, 2002, 2009, and 2015, and is currently completing production of the 2025 assessment report.

B. AMAP's Radioactivity implementation plan – Overview of Implementation Activities

AMAP's Radioactivity implementation plan for 2025-2027 includes three primary activities:

- Scoping of the next AMAP assessment on radioactivity in the Arctic
- Strengthening collaboration with international fora
- Communication and outreach related to the 2025 assessment report

These activities are carried out in ways that specifically address the AMAP Strategic Goals and Guiding Principles².

1. Scoping of the next AMAP assessment on radioactivity in the Arctic

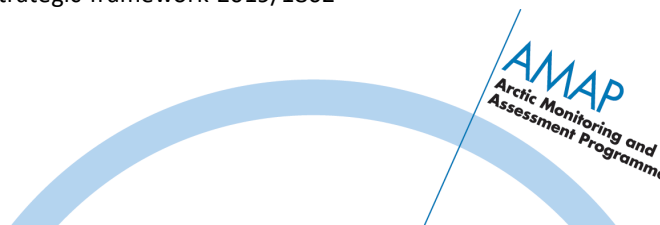
Rationale and description:

AMAP's mandate 'to monitor and assess the status of the Arctic region with respect to pollution ...' encompasses the assessment of both existing and emerging pollution threats. Following temporal trends in contaminant levels in the Arctic is vital for enabling AMAP to inform policy-makers about the effectiveness of their actions to reduce contamination and to identify potential pollution threats.

The AMAP 2025 Assessment of Radioactivity in the Arctic, which, as of June 2025 is in its final production stages, captured data up to 2020 and focused on the sources and trends of radionuclides to and within the Arctic environment. It also provides new information about radioactive waste handling and decommissioning and addresses possible effects that climate change might have on radioactivity in the Arctic. A related [Summary for Policy-makers](#) (SPM) was released in connection with the 14th Meeting of the Arctic Council, on May 12, 2025 as a formal AMAP deliverable to the Arctic Council.

In the 2025-2027 period, AMAP will undertake preparatory work for development of a scoping document for the next AMAP assessment of radioactivity in the Arctic. The 2025 assessment should provides the rationale/context for new or updated assessments at regular intervals. More specifically, the AMAP Radioactivity Expert Group will meet regularly to discuss:

² <https://www.amap.no/documents/doc/amap-strategic-framework-2019/1802>



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- Lessons learned from the 2025 assessment. In particular, there are messages in the 2025 SPM on questions/matters that should be included in future work. Some topics include climate change, increased civil and military activities in the Arctic and the balance between monitoring for naturally occurring (NOR) and anthropogenic nuclides. Consider the need to harmonise monitoring and develop standardised guidelines.
- Preparations for the next assessment, tentatively targeted to be organised during 2027-2029 or 2029-2031 (TBD)
- Current activities of expert group members, including preparations for and participation in funding calls.
- The process for bringing national monitoring data together for assessments, including the possibility of a process/platform for bringing together data from monitoring stations. The latter would enable a better understanding of atmospheric radionuclide levels, the behavior of other pollutants, and their associated risks.
- Communication with AMAP climate experts, especially on permafrost from the perspective of radon.
- Communication with nuclear safety/accident analysts and emergency preparedness policy groups to address the issue of increasing potential for an accident in the Arctic as novel technologies are introduced (e.g., SMRs) and military presence and activities increases.

Progress to-date:

Work on this component will be initiated in September 2025.

2. Strengthening collaboration with international fora

Rationale and description:

One of AMAP's strategic goals is to support relevant international processes. Results from the AMAP assessments are reported to the Arctic Council and governments of Arctic and observer states as well as to relevant international organizations and processes that use AMAP results in their work.

Under this activity, the REG and the AMAP Secretariat will seek to enhance collaboration with international fora like the International Commission on Radiological Protection (ICRP), the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), International Atomic Energy Agency (IAEA), The EU Joint Research Center (EU JRC), OSPAR, and the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO). There are experts involved in different activities within international work. These experts of AMAP can facilitate the collaboration, transfer of data from Arctic and improved use of Arctic data in global assessments.

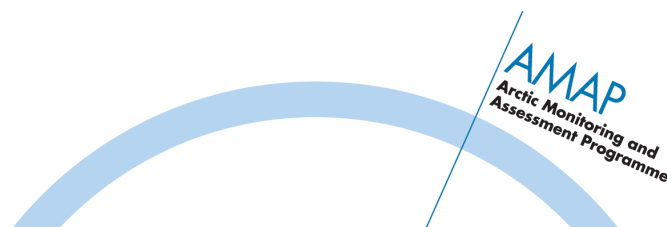
The REG should also seek collaboration with similar processes under EPPR.

Progress to-date:

Work on this component will be initiated in September 2025.

3. 2025 assessment report - Communication and Outreach

The scientific report of the AMAP 2025 Assessment of Radioactivity in the Arctic will be published in summer 2025. The associated Summary for Policy-makers (SPM) was released on May 12, 2025.



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Outreach and communication activities will include webinars, journal articles, media/social releases, and various presentations.

- AMAP is organising a series of webinars in 2025. The scientific report and the SPM should be the subject of a webinar subsequent to the May 2025 14th meeting of the Arctic Council, which would be open to a broad audience, including Observers.
- An offer from the *Journal of Environmental Radioactivity* to publish journal articles based on the assessment report is currently under consideration.

Progress to-date:

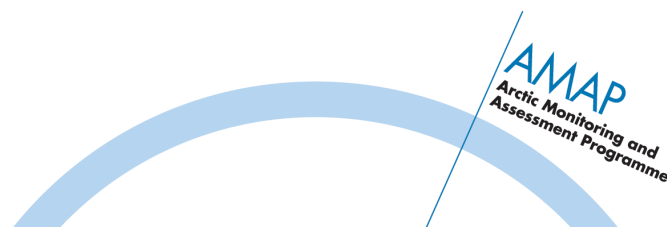
Release of the 2025 SPM:

The Summary for Policy-makers Radioactivity in the Arctic was released on May 12, 2025 and was accompanied by a press release issued by the AMAP Secretariat and posts on social media:

- <https://www.linkedin.com/feed/update/urn:li:activity:7330524647446175746/?actorCompanyId=80875483>
- <https://www.facebook.com/AMAPSecretariat>
- https://www.instagram.com/p/DJ3t1uAqj5m/?img_index=1
- https://www.linkedin.com/posts/arctic-monitoring-and-assessment-programme_amap-has-just-released-three-new-summaries-activity-7332638607704248320-P0hW?utm_source=share&utm_medium=member_desktop&rcm=ACoAAAW4ojwBmXv2tvRsWjSZ4bmo-qAVbh3gmrs
- https://www.instagram.com/p/DKGu-qcKDnW/?img_index=1
- <https://www.facebook.com/AMAPSecretariat>

Oral presentations at Meetings/Conferences:

- March 2025, Bodø, Norway: Norwegian Arctic Council chairship meeting. Arctic Emergency Management Conference
- March, 2025, Phoenix, Arizona, USA: Joint panel with Norwegian DSA, Canada CNL, US DOE Office of Environmental Management, and US Office of Environmental Management on the Arctic
- February, 2025, Monaco: Presentation to OSPAR's Radioactive Substances Committee (RSC)
- February, 2025, Anchorage, Alaska, USA: Joint panel with US DOE Office of Environmental Management and Office of Legacy Management at the Alaska Forum on the Environment
- October 2024, Reykjavik, Iceland: Joint panel with AMAP and EPPR at Arctic Circle Assembly
- March 2024, Phoenix, Arizona, USA: Joint panel with US DOE Office of Environmental Management and Office of Legacy Management at the 2024 Waste Management Symposia.
- Violeta Hansen, Angela Sabo, Juergen Korn, Douglas MacLean, Dorte Petersen, Jens Søgaard-Hansen, Frank Farsø Riget, Joel Cubley, Mats Isaksson. Oral presentation: Indoor radon survey in Greenland and Whitehorse, Canada, and dose assessment. NSFS XIX Conference, June 5-9, 2023 "Sharing and caring", Malmö, Sweden
- Violeta Hansen, Louise Kiel Jensen, Hilde Elise Heldal, Ari-Pekka Leppänen, Jussi Paatero, Pål Andersson, Jing Chen, Weihua Zhang, Chuanlei Liu, Malcolm McKee, Tim Moulding, Hans Pauli Joensen, Kjartan Gudnason, Gísli Jónsson, Pernille Ahlmann Jensen, Edyta Łokas, Amanda Andersen, Ingvild Engen Finne, Mari Komperød, Bredo Møller, Mats Isaksson. NSFS XIX Conference, June 5-9, 2023 "Sharing and caring", Malmö, Sweden



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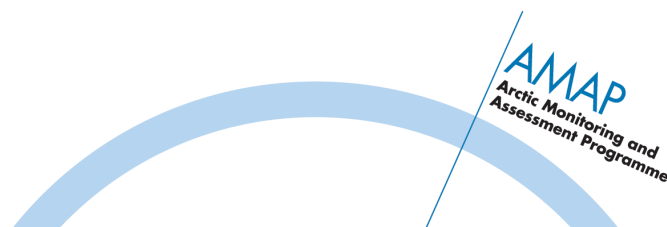
- November 2022, Vienna, Austria: Presentation at IAEA Methods for Radiological and Environmental Impact Assessment (MEREIA) technical meeting potential consideration of Arctic case study
- March 2022, Phoenix, Arizona, USA: Presentation of status of AMAP Radioactivity Expert Group work at the 2022 Waste Management Symposia. Link to website: <https://www.wmsym.org/technical-program/proceedings/> (To get to the WM Conference proceedings, individuals need to login to their profile. There is no charge to create a profile)
- International Conference dedicated to the 60th anniversary of establishing the State Service for Radiometric Monitoring and Information (*RPA «Typhoon»*) *Obninsk, October 19-21, 2021*, oral presentation: Arctic Monitoring and Assessment Programme, AMAP, Radioactivity in the Arctic, 2023 Assessment, Chapter 2: Naturally occurring radionuclides Violeta Hansen, Anders Mosbech, Louise Kiel Jensen, Hilde Elise Heldal, Ingvild Engen Finne, Mari Komperød, Carol Robinson, Justin Gwynn, Ari Leppänen, Jussi Paatero, Pål Anderson, Amanda Andersen, Weihua Zhang, Chuanlei Liu, Trevor Stocki, Angela Sabo, Tim Moulding, Malcolm – McKee, Margarita Katkova, Alexander Kryshev, Kjartan Gudnason, Gísli Jónsson, Jixin Qiao, Hans Pauli Joensen

Published peer-reviewed papers

1. Violeta Hansen, Dorthe Petersen, Jens Sjøgaard-Hansen, Frank Farsø Rigét, Anders Mosbech, Daniel Spelling Clausen, Gert Mulvad, Tryggve Ronnqvist. Indoor radon survey in Greenland and dose assessment, *Journal of Environmental Radioactivity* 257 (2023) 107080. <https://doi.org/10.1016/j.jenvrad.2022.107080>
2. Violeta Hansen, Angela Sabo. Radon in Yukon dwellings and dose assessment. Submitted revised version, 9 Jan 2023 to *Journal of Radiological Protection*, accepted to be published on 15 Jan 2023.
3. Violeta Hansen, Anders Mosbech, Frank Farsø Rigét, Jens Sjøgaard-Hansen, Peter Bjerregaard, Rune Dietz, Christian Sonne, Gert Asmund, Niels Bøknæs, Maia Olsen, Kim Gustavson, David Boertmann, Sandra Drewes Fabricius, Daniel Spelling Clausen, Alexander Serban Hansen. Background ^{210}Po and activity concentrations in Greenlandic marine biota, and dose assessment, *Science of the Total Environment* 806 (2022) 150508. <https://doi.org/10.1016/j.scitotenv.2021.150508>
4. Violeta Hansen, Anders Mosbech, Jens Sjøgaard-Hansen, Frank Farsø Rigét, Flemming Ravn Merkel, Jannie Fries Linnebjerg, Ralf Schulz, Jochen P. Zubrod, Igor Eulaers, Gert Asmund. 2020. ^{210}Po and ^{210}Pb activity concentrations in Greenlandic seabirds and dose assessment. *Science of the Total Environment* 712 (2020) 136548. <https://doi.org/10.1016/j.scitotenv.2020.136548>

Media Interviews

1. The race against radon. Scientists are working to map out the risks of the permafrost thaw, which could expose millions of people to the invisible cancer-causing gas. By Chris Baraniuk 05.11.2022. Knowable Magazine. <https://www.facebook.com/pagina100prensa/posts/scientists-are-working-to-map-out-the-risks-of-the-permafrost-thaw-which-could-e/789929721915142/>
2. A risk of radon exposure in the Arctic as permafrost thaws (knowablemagazine.org) - CBS Radio Yukon, Canada. a 15 min radio interview at CBC CANADA: <https://lnkd.in/dBF3d8ne>



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3. Kræftfremkaldende gas siver ind i de grønlandske hjem. Kræftfremkaldende gas siver ind i de grønlandske hjem, KNR. <https://knr.gl/da/nyheder/kr%C3%A6ftfremkaldende-gas-siver-ind-i-de-gr%C3%B8nlandske-hjem>
4. Grønlændere kan være i høj risiko for radon - og det er ikke uden konsekvenser | Sermitsiaq.AG 6. <https://www.sermitsiaq.ag/samfund/gronlaendere-kan-vaere-i-hoj-risiko-for-radon-og-det-er-ikke-uden-konsekvenser/298813>

Arctic Hub produced a video on radon & climate change in the Arctic by Violeta Hansen

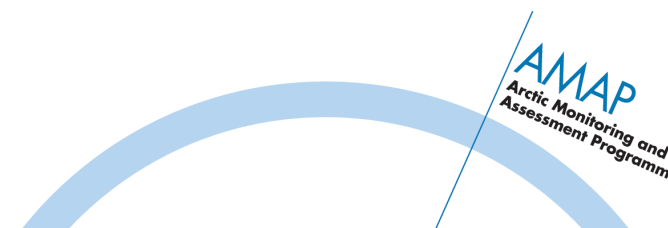
1. Researcher is measuring radon in Greenlandic homes – Arctic Hub. <https://polarjournal.net/researcher-is-measuring-radon-in-greenlandic-homes/>

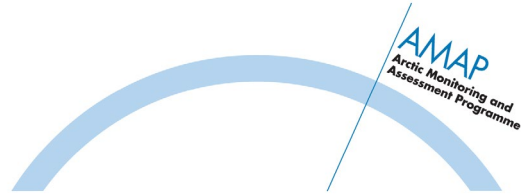
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Implementation activities – Timelines and Tasks			
	Scoping of the next AMAP assessment on radioactivity in the Arctic	Strengthening collaboration with international fora	Communication and outreach related to the 2025 assessment report
Timing	Tasks	Tasks	Tasks
Summary for 2025-2027	SUMMARY OF KEY STEPS, AT A GLANCE <u>Key Meetings</u> : Regular, monthly meetings of the REG <u>Main Product(s)</u> : Delivery of a scoping document to AMAP HoDs in 2027 <u>Call for Nominations</u> : June 2025	SUMMARY OF KEY STEPS, AT A GLANCE <u>Key Meetings</u> : [TBD] <u>Main Product(s)</u> : [TBD] <u>Outreach Events</u> : [TBD]	SUMMARY OF KEY STEPS, AT A GLANCE <u>Main Product</u> : <ul style="list-style-type: none">- 2025 asesment report- Journal articles (TBD) <u>Outreach Events</u> : <ul style="list-style-type: none">- Webinar in 2025, date TBD- Conference session (TBD)
June 2025 - October 2025	Call for nominations		Drafting of journal articles (TBD)
	Monthly meetings in Expert Group		
October 2025 - October 2026	Monthly meetings in Expert Group		
AMAP WG meeting autumn 2026	Delivery of 1st draft of a scoping document		





Cross-cutting Issue: Human health in the Arctic

(version July 2025; approved in June 2025)

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address **Human health in the Arctic** (version May 2025)

AMAP Workplan Implementation Plan 2025-2027

Implementation Plan for AMAP work to address Human Health in the Arctic

AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impacts on Arctic ecosystems and human populations.

The table below presents a detailed stepwise plan for implementing AMAP work to address **human health in the Arctic** during 2024 and subsequent years. This plan has been developed from previous plans to help advance project-level work under the most recently approved AMAP Work Plan, according to the *AMAP Strategic Framework 2019+*, including its guiding principles and strategic goals.

The implementation activities described below will be carried out by the AMAP Expert Group(s) with the support of the AMAP Secretariat, under the direction of AMAP HoDs and PPs, and in a manner that is consistent with **current Arctic Council guidelines for resumption of Working Group work**.

These activities will support / contribute to the following AMAP Projects (as per AMAROK):

- Contaminant issues: human biomonitoring;
- Human Health and combined effects;
- Implementing AMAP Contaminant Trends and Effects Monitoring Programme;
- Support for International Conventions (Minamata, Stockholm)
- Participation in international workshops, conferences;
- Efforts to engage PPs in AMAP's work.

The key AMAP products and deliverables planned for 2024-2025 in relation to AMAP work to address **human health in the Arctic** are:

- Scientific publications
- Updated monitoring programme;
- Outreach at international scientific conferences.

This implementation plan is intended to be updated on a biannual basis (approximately January and July), or as needed, as determined by AMAP HoDs.

Background:

Environmental contaminants, particularly persistent organic pollutants (POPs) and mercury, were identified as a priority pollution issue in the process that led to the establishment of AMAP in 1991. AMAP's work on contaminants in humans constitutes a core part of AMAP's activities to address environmental contaminants that can impact Arctic wildlife and human health. This work is

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Implementation Plan for AMAP work to address Human health in the Arctic *(version May 2025)*

organized under AMAP's Human Health Assessment Group (HHAG), and is coordinated internally with, in particular, AMAP EGs on POPs and mercury.

In addition to informing the Arctic Council and its member states and Permanent Participants, AMAP assessment and data products concerning POPs, mercury and emerging contaminants of concern provide important contributions to international processes that address chemicals management and action to reduce environmental pollution. In this respect, AMAP contributes to work under the UNEP Stockholm Convention on Persistent Organic Pollutants and the UNEP Minamata Convention on Mercury. It also relates to current UN initiatives to link Conventions dealing with climate change, biodiversity and pollution.

Strategic direction

AMAP contaminants and human health assessments address priority issues that have been at the core of AMAP work for the past 30 years. In particular, they are associated with concerns of Arctic Indigenous peoples including food security, where wildlife exposure/contamination and human exposure to contaminants through traditional diets are closely related, and contaminant effects on wildlife that, at the population level, could threaten Arctic biodiversity.

The Human Health Implementation Plan has four components, two of which respond to the overall goal of improving coordination between AMAP groups involved in contaminants, climate and human health assessment work, including addressing climate change impacts on wildlife and human health. The work is also directed at enhancing relevant components of the AMAP program to better support more integrated contaminants-health assessments and to introduce new methodologies, including methods to address new health concern issues such as zoonoses.

The four components are:

- Biomonitoring of contaminants
- Dietary transitions in Arctic regions
- Contaminants in wildlife and humans
- Impacts of climate change on human health

B. AMAP's Human health implementation plan – Overview of Implementation Activities

Human Health Assessment Group co-leads: Cheryl Khoury (CAN) and Pál Weihe (KOD)

1. Biomonitoring of contaminants in humans, including trends and effects

Project lead: Bryan Adlard (CAN)

Rationale and description:

Biomonitoring of contaminants in humans in the Arctic is a core activity of AMAP that has been conducted for several decades to document the levels and trends of environmental contaminants in human media, primarily blood. The contaminants covered include POPs, mercury, some trace metals, and an increasing number of contaminants of emerging concern. Data are collected in cohort studies, particularly mother-child cohorts, as well as in various national and regional

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programs and studies. Data are compiled by AMAP on a periodic basis to contribute to an assessment report, the most recent of which was published in 2021. This activity also includes review and compilation of data and results from national and other studies of health effects associated with contaminant exposure, particularly from dietary sources, and evaluations of the health risks of such exposures. This includes aspects of risk communication.

As part of this activity and together with the POPs Expert Group, human biomonitoring data are compiled for contribution to the Stockholm Convention Effectiveness Evaluation programs. Together with the Mercury Expert Group, human biomonitoring data on mercury contributed to the Minamata Convention Effectiveness Evaluation programs.

Human biomonitoring is a component of the AMAP Trends and Effects Monitoring Programme, which is scheduled for review and revision in this work period. Potential additions or changes to the program will be discussed in association with the wider review of the monitoring guidelines.

Progress to date

Compilations of biomonitoring data and evaluations of impacts on human health have been compiled in human health assessment reports approximately every five years. The most recent assessment report was published in 2021. This contained chapters with compilations of data on human biomonitoring and exposure from regional, national and international studies; compilations of results on health effects associated with measured contaminants in the Arctic; information on methods to estimate human health risks associated with contaminants in the Arctic; and examples of risk communication strategies to Arctic communities, all of which were updates on and continuation of early assessments. In addition, this report contained the first reporting and assessment of recent and ongoing changes in dietary habits in Arctic communities.

Progress has been made on the "AMAP 2021 Human Health in the Arctic" special issue in the International Journal of Circumpolar Health. Eight articles have been developed based on the chapters of the 2021 assessment. Seven of these articles were published in 2024 and the remaining article is expected to be published in 2025.

Biomonitoring of contaminants in humans continues in cohort studies and regional, national and international programs. As the most recent compilation of relevant literature and data from cohort studies and biomonitoring activities is from five years ago, a new compilation of literature and data has begun, with the aim of preparing a report in 2026.

2. Dietary transitions in Arctic communities

Project lead: Kelly Skinner (CAN) (possible co-lead from Greenland)

Rationale and description:

Dietary and cultural transitions in the Arctic have been influenced by contact with Western culture and better communication, as well as by concerns regarding potential contaminant-related risks and the safety of consuming traditional marine foods within Arctic populations. Contaminant exposure from the traditional diet and counterbalancing the nutritional, cultural and social importance of these foods is difficult as changes in diet may have both negative and positive

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address Human health in the Arctic *(version May 2025)*

impacts, but how they will balance is often difficult to ascertain. However, the decrease in consumption of healthy subsistence foods and the increased use of market foods are resulting in less nutritious diets and a lack of key nutrients. Food insecurity is also an issue in some Arctic populations and needs to be taken into consideration in relation to diet and dietary transitions.

Progress to date

A first overview of dietary transition in Arctic regions was prepared for the 2021 human health assessment. This described the traditional diet in each major region of the Arctic, the dietary changes and consequences of this dietary transition, as well as the level of food security/insecurity.

Follow up on this work has continued in this work period. This item is to continue to compile information on ongoing dietary transitions in Arctic communities, especially in Indigenous communities, that have occurred over recent decades and their impacts on nutritional and health status. Further studies of dietary transition are also needed, as well as establishing a better link between data and information collected in biota monitoring work concerning species that are part of traditional diets and human health work to estimate dietary exposure to contaminants. This should also consider nutrient deficiencies and other impacts associated with dietary transition.

Considerations should also be given to harmonize questionnaires across the Arctic to some extent, but maintaining awareness of cultural differences.

Scoping of literature for a follow-up report is being initiated.

3. Contaminants in wildlife and humans

Rationale and description

AMAP contaminants and human health assessments address priority issues that have been at the core of AMAP work for the past 30 years. In particular they are associated with concerns of Arctic Indigenous Peoples including food security, where wildlife exposure/contamination and human exposure to contaminants through traditional diets are closely related, and contaminant effects on wildlife that, at the population level, could threaten Arctic biodiversity

The overall goal of this activity is to improve coordination between AMAP groups involved in contaminants and human health assessment work, also addressing climate change impacts on wildlife and human health. The work is also directed at enhancing relevant components of the AMAP program to better support more integrated contaminants-health assessments and to introduce new methodologies, including methods to address new health concern issues such as zoonosis.

Progress to date

A first overall consideration of this issue took place in an online workshop held on 24-25 June 2020, with the aim of, among others, strengthening cooperation on work on POPs, mercury and human health within AMAP and also with other groups. Improved engagement of Indigenous groups, especially Permanent Participants, was also discussed as well as the preparation of more integrated information for international processes, improved communication and outreach

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Implementation Plan for AMAP work to address Human health in the Arctic *(version May 2025)*

products. An important focus was on contaminants in wildlife and humans as well as One Health initiatives and zoonotic diseases in subsistence species.

As a follow-up to this workshop, it was agreed that cross-cutting review papers, bringing together results on wildlife and humans, should be prepared on four topics to bring the work forward: 1) zoonoses and food security; 2) effects of contaminants on wildlife and humans; 3) chemicals of emerging Arctic concern; and 4) a case study on PFASs.

Work on these four papers was considered and advanced at a workshop funded by the Kingdom of Denmark, held on 23-25 May 2023 at Sandbjerg Manor in southern Denmark. In addition, new findings and technical developments were also considered and a Task Team was proposed to review the current AMAP Trends and Effects Monitoring Programme and another to review and consider the addition of new methodologies that could be used in wildlife and human biomonitoring programs.

This work aims to develop closer connections and integration in AMAP's work related to contaminants and their effects on wildlife, and on human health impacts of exposure to environmental contaminants and related issues (including the impacts climate change on contaminant processes, zoonoses, and wildlife and pathogen vector distribution).

As these are cross-cutting issues, experts from the HHAG will work with experts from the POPs and Mercury EGs to develop the work further, as described in the implementation plan for zoonoses.

Details of this work are described in the Implementation Plan for Arctic One Health: Contaminants, Wildlife, Human Health and Food.

4. Impacts of climate change on human health and well-being in the Arctic

Rationale and description

As an outcome of the work on Chapter 7 Impacts of climate change and climate extremes on Arctic livelihoods and communities in the *AMAP Arctic Climate Change Update 2021: Key Trends and Impacts*, it was considered that AMAP should prepare an overall assessment of the societal implications of climate change in the Arctic. Scoping this assessment indicated that there were a number of implications of climate change for human health and well-being, including risks for food and water security; implications for the distribution, availability and quality of subsistence species; physical risks associated with permafrost thaw or poor sea and lake ice quality, among others.

Progress to date

The above-mentioned issues will be addressed in the Societal Implications of Climate Change in the Arctic (SICCA) assessment, with HHAG experts joining other health experts and Indigenous knowledge holders in the preparation of one or more chapters in this assessment that will provide a pan-Arctic overview of the implications of climate change on food and water security, including the release of contaminants from thawing permafrost and their availability to humans, availability/quality of subsistence species, etc. As well as implications for health and well-being in terms of, for example, the northward movement of pests and pathogens. Particular consideration will be given to Indigenous and local communities.

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The overall work on this assessment is described in the Climate Implementation Plan.

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	Biomonitoring of contaminants in humans, including trends and effects	Dietary transitions in Arctic communities	Contaminants in wildlife and humans¹	Implementing the assessment of societal implications of climate change assessment (SICCA)²
Timing	Tasks	Tasks	Tasks	Tasks
September 2024			Case study on PFAS in the Arctic published in STOTEN	
				•
December	<ul style="list-style-type: none"> Literature scan/data collection 	<ul style="list-style-type: none"> Scoping of available literature 	Review paper on contaminants and zoonotic diseases published in STOTEN	<ul style="list-style-type: none"> Workshop planning
Jan-Jun 2025	<ul style="list-style-type: none"> Literature scan/data collection Meeting of experts to discuss next steps 	<ul style="list-style-type: none"> 	<p>Review paper on biological effects of contaminants in wildlife and humans to be finalized for submission to STOTEN</p> <p>Review paper on human exposure to CEAS in the Arctic in preparation</p>	<p>Updated scoping document to reflect the co-assessment approach and response to HoDs comments in the HoDs meeting in December-24</p> <p>Monthly chapter meetings</p> <p>Nominations of contributing authors (Due 25 April)</p> <p><u>Finalizing outlines for HoDs review May 30 – June 20</u></p> <p><u>Preparing draft chapters</u></p>

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	Biomonitoring of contaminants in humans, including trends and effects	Dietary transitions in Arctic communities	Contaminants in wildlife and humans¹	Implementing the assessment of societal implications of climate change assessment (SICCA)²
Timing	Tasks	Tasks	Tasks	Tasks
July-Dec 2025	<ul style="list-style-type: none"> Coordination of data input 	<ul style="list-style-type: none"> 	<p>Establish team to work on methods that could be used to monitor zoonotic diseases in the Arctic and prepare recommendations</p> <p>Establish team to work on new methods that could be used for more integrated wildlife and human biomonitoring and prepare recommendations</p>	<p>First draft (august)</p> <p>PP review by review editor (October)</p> <p>National Data Check (<u>Dec 15-Feb 15</u>)</p>
Oct 2025	<ul style="list-style-type: none"> Draft outline of time trends analysis and identification of potential contributors 	<ul style="list-style-type: none"> Literature scan 	Workshop to develop a prospectus for an Assessment activity in co-production with PPs in relation to Arctic food security and Arctic One Health	
November 2025	<ul style="list-style-type: none"> Discussion of outline at HHAG virtual meeting 	<ul style="list-style-type: none"> Discussion of scope at HHAG virtual meeting 		
March 2026	<ul style="list-style-type: none"> Draft report and discussion at HHAG virtual meeting 	<ul style="list-style-type: none"> Draft outline and identification of potential contributors at HHAG virtual meeting 		Peer review
May 2026	<ul style="list-style-type: none"> National review of report 	<ul style="list-style-type: none"> 		

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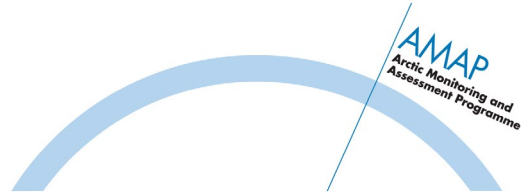
	Biomonitoring of contaminants in humans, including trends and effects	Dietary transitions in Arctic communities	Contaminants in wildlife and humans¹	Implementing the assessment of societal implications of climate change assessment (SICCA)²
Timing	Tasks	Tasks	Tasks	Tasks
Summer 2026	<ul style="list-style-type: none"> Preparation of revised report for peer review in the fall 	<ul style="list-style-type: none"> 		
Fall 2026	<ul style="list-style-type: none"> Submission of report for peer review 	<ul style="list-style-type: none"> Draft report discussed at HHAG virtual meeting 		
Winter 2027	<ul style="list-style-type: none"> Final report to be prepared by end of March 2027 	<ul style="list-style-type: none"> 		
Spring 2027	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> National review of report 		
Summer 2027	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 		
Fall 2027	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Submission of report for peer review 		
Winter 2028	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Final report prepared by end of March 2028 		

¹See Implementation Plan for Arctic One Health: Contaminants, Wildlife, Human Health and Food

²Taken from Implementation plan for climate

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Cross-cutting Issue: Contaminants-Wildlife and Human Health in the Arctic

(version May 2025; subject to requested update)

AMAP Implementation Plan Contaminants, Wildlife and Human Health

AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impact on Arctic ecosystems and human populations.

The document below presents a detailed stepwise plan for implementing AMAP work to address **Contaminants, Wildlife and Human Health** during throughout 2025 to 2027. Together with other implementation plans that collectively cover the broad suite of areas of focus within the AMAP mandate (e.g. on Human Health, Climate, Mercury, POPs and CEACs) this plan is intended to advance project-level work under the current [AMAP Workplan](#) and according to the [AMAP Strategic Framework 2019+](#), including its guiding principles and strategic goals, and to provide members, participants and Observers to AMAP work and processes with a common understanding of the combined effects of contaminants on wildlife and human health under a rapidly warming climate.

The implementation activities described below will be carried out by AMAP Expert Group(s) with the support of the AMAP Secretariat, under the direction of AMAP HoDs and PPs, and in a manner that is consistent with [current Arctic Council guidelines for resumption of Working Group work](#).

These activities will support / contribute to the following AMAP Projects (as per AMAROK):

- Human Health and combined effects.
- Implementing AMAP Contaminant Trends and Effects Monitoring Programme.
- Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC)
- Addressing Climate Change and Pollution Issues.
- Participation in international workshops and conferences.
- Efforts to engage PPs in AMAP's work.

The key AMAP products and deliverables planned for 2025-2027 in relation to AMAP work to address **Contaminants, Wildlife and Human Health** are:

- Technical reports, including recommendations for consideration by AMAP HoDs.
- Updated monitoring program, potentially including new methodological approaches and monitoring of zoonotic diseases (see new projects – Appendix 1).
- Outreach products, including webinars and outreach at international scientific conferences.

This implementation plan is intended to be updated and presented to the AMAP WG on a biannual basis (approximately June and November), or as needed, as determined by AMAP HoDs.

The composition of the membership and leadership of the AMAP Project Group tasked with the activities included in this plan will be determined by the HoDs as a first step in implementation work.

A. Background:

AMAP has produced several assessments addressing trends and levels of contaminants in Arctic wildlife and fish and related effects (e.g., 2018 report “Biological effects of contaminants on wildlife and fish”; “2021 Assessment of Mercury in the Arctic”, etc.), as well as assessments considering contaminant effects on human health (e.g., “2021 Human Health Assessment”). These assessments have also considered immune-suppressive effects of certain environmental contaminants on both wildlife and humans. In particular these assessments address some of the concerns of Arctic Indigenous Peoples regarding food security, associated with wildlife exposure/contamination and human exposure to contaminants through traditional diets. These issues are closely related; contaminant effects on wildlife, at the population level, could also threaten Arctic biodiversity.

Following initial consultations involving leads of relevant AMAP Expert Groups and HoDs between 2017 and 2020, a collaborative project was included in the 2021-2023 AMAP Workplan. However, due to the pause in the work of the Arctic Council bodies, this initiative was suspended; the resumption of Arctic Council/AMAP work makes appropriate to now re-initiate this implementation activity.

In the interim, a workshop, co-arranged by Kingdom of Denmark and Canada, was organized by the University of Aarhus (23-25 May 2023 in Sandbjerg, Denmark). This workshop considered approaches to integrating work on Arctic pollution and climate and their effects on ecosystems and humans in a One Health context. This implementation plan considers some of the outcomes and recommendations of this workshop, as described below.

B. AMAP’s contaminants-wildlife-human health implementation plan – Overview of Implementation Activities

1. Knowledge synthesis – Informing future actions through demonstration of collaborative work

Rationale and description:

Work was organized to prepare four technical papers to inform future needs taking into consideration: scientific integrity; value of diverse perspectives; inclusion of Arctic Indigenous Peoples and local residents; responsiveness to emerging challenges; knowledge mobilization; and cooperation, coordination and interactions. This work constituted a pilot activity to demonstrate the advantages of closer collaboration between experts from different fields (contaminants, veterinary sciences, human health, etc.).

Progress to date:

Two of these papers are now published ([Cross-cutting studies of per- and polyfluorinated alkyl substances \(PFAS\) in Arctic wildlife and humans](#), and [Environmental stressors and zoonoses in the Arctic: Learning from the past to prepare for the future](#)). One paper on “Wildlife-Human biological effects (crosscutting)” is in advanced preparation phase and intended for submission during Summer 2025. Another paper on “Human Exposure to CEACs” is in an advanced preparation state, but with a yet undefined submission date.

2. Developing concrete recommendations on methodologies that could be used to monitor of zoonotic diseases in the Arctic

Rationale and description:

The potential increase in occurrence and spread of zoonotic diseases in the Arctic is an area of increasing concern. The Arctic Monitoring and Assessment Programme (AMAP) currently has no

activity to monitor zoonotic diseases. During 2025-2027, AMAP will work towards producing recommendations for methodologies that could be used to monitor zoonotic diseases in the Arctic. Additionally, a potential zoonosis monitoring program will be dependent on the above-mentioned recommendations.

Progress to date:

Building on background work to review the subject of zoonotic diseases in the Arctic (see 1) a proposal for a new project on this topic has been developed for consideration by HoDs (see new projects – Appendix 1).

3. Developing concrete recommendations on new methodologies that could be used for more integrated wildlife and human biomonitoring

Rationale and description:

New methodologies and approaches exist with potential for application in monitoring the effects of climate change, contaminants and other stressors on wildlife and humans. Several of these new approach methods are now of regulatory interest in several AC member states (including EU countries, Canada, and USA) and thus it would be prudent to understand how this may influence contaminants work in the Arctic region.

During 2025-2027, AMAP will work towards producing technical reports scoping new approach methods to monitoring and assessment work, including recommendations for consideration by AMAP HoDs.

Progress to date:

HoDs have initiated technical work to review new approaches and make concrete recommendations on new methodologies that could be used in wildlife and human biomonitoring (see project proposal). A Task Team has been established to further this work under the leadership of Nil Basu (Canada). An invitation to nominate experts was circulated in March 2025 and nominations are currently being reviewed. A first project group workshop is planned for before summer 2025.

4. Contaminants, Wildlife and Human Health in relation to Arctic Food Security and Arctic One Health

The long-term effects of climate change in the Arctic cannot be adequately predicted or mitigated without an understanding of the synergistic effects between climate change, environmental contaminants and pathogens on the health of humans and animals in the Arctic in a One Health approach.

Building on the outcomes of the above activities, new initiatives may be planned in future AMAP workplans for an integrated and co-produced cross-cutting assessment activity. A possible theme for such a cross-cutting assessment activity could be ‘food security’ in as far as this relates to exposure of human populations to environmental contaminants and pathogens through their diet. These interconnects work on levels of environmental contaminants and their effects on wildlife, impacts of climate change on Arctic ecosystem structure, related consequences for food availability and quality, etc.

Such work would have potential links to work under other AC working groups relevant to an Arctic One Health approach.

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Progress to date:

This activity would form part of AMAP's future work planning. During 2025-2027, AMAP will work towards producing a potential technical report and SPM on Contaminants, Wildlife and Human Health in relation to Arctic Food Security and Arctic One Health.

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Implementing AMAP work to address Contaminants, Wildlife and Human Health

(version May 2025)

Implementation activities – Timelines and Tasks				
	Knowledge synthesis – Informing future actions through demonstration of collaborative work	Methodologies that could be used to monitor of zoonotic diseases in the Arctic	New methodologies that could be used for more integrated wildlife and human biomonitoring	Contaminants, Wildlife and Human Health in relation to Arctic Food Security and Arctic One Health
Timing	Tasks	Tasks	Tasks	Tasks
Jan-Dec 2024	<i>See archived record of implementation work in 2024</i>			
Summary for 2025-2027	SUMMARY OF KEY STEPS, AT A GLANCE <u>Product(s) Completed:</u> two scientific papers from the workshop in Sandbjerg 2023.	SUMMARY OF KEY STEPS, AT A GLANCE <u>Call for nominations:</u> to be circulated in June 2025 <u>Key Meetings:</u> project group meetings to be arranged as necessary <u>Product(s) Completed:</u> recommendations for HoDs end of 2025 and a monitoring program for potential zoonoses in 2026	SUMMARY OF KEY STEPS, AT A GLANCE <u>Call for nominations:</u> circulated in March 2025 <u>Key Meetings:</u> project group meetings to be arranged as necessary <u>Product(s) Completed:</u> recommendations for HoDs end of 2025	SUMMARY OF KEY STEPS, AT A GLANCE <u>Key Meetings:</u> Workshop for and assessment activity in co-production with PPs end of 2025 <u>Product(s) Completed:</u> technical report and SPM in 2027-2029.
Mar 2025			Nominations for project group	
Jun 2025	Milestone: Biological effects in wildlife and humans STOTEN article (Likely finalized by Summer 2025)		Review of nominations; Establish team; online project group meeting to organize work	
Jun-Aug 2025	Milestone: Human Exposure to CEACs STOTEN article (in advanced preparation phase)	Establish team and prepare recommendations (no objections to WG36 decision, approved)		
Oct-Dec 2025		Milestone: Recommendations for HoDs consideration	Milestone: Recommendations for HoDs consideration	Workshop to develop a prospectus for an Assessment activity in co-production with PPs
Jan-Jun 2026		Milestones/Products: Potential zoonoses monitoring program	Follow up	
2027-2029				Milestones/Products: Potential technical report and SPM deliverable

APPENDIX 1

New Projects

Monitoring and assessment of existing and potential zoonotic diseases in the Arctic

Activity/project type:

- ☐ New assessment
- ☐ Update assessment
- ☐ Technical product(s)
- ☒ Scoping activity
- ☐ Workshop/event
- ☐ Outreach event (specify target(s)):
- ☐ Other (describe):

Project/Activity Proposed/Supported by:

Proposal developed by:

AMAP Secretariat

Summary description

The activity in this document intends to prepare the background for subsequent work to: “assess animal-to-human transmission risk of infections in the Arctic - to identify the Arctic communities at higher health risks related to climate change impact on migration routes, seasonality and breeding area of species capable of transmitting infectious agents”.

Background, scope and rationale

Currently, while AMAP implements a human biomonitoring programme for environmental contaminants that considers some related health conditions, it does not have a monitoring programme to address zoonotic diseases. National Arctic monitoring systems for diseases associated with pathogens affecting human health are based primarily on their occurrence in a limited list of media (water, soil, market food, and human media). In a broader context, biological hazards are organisms or biological substances that can affect the health of humans and animals. These include e.g. parasites, viruses, bacteria, fungi, venomous marine fishes, plants and their biotoxins, and allergies. The environmental and health risks of a biohazard vary greatly by e.g. its characteristics, origin and exposure pathway (e.g. vector-borne pathogen exposure, consumption of contaminated food and water, or contact with contaminated surfaces).

The Arctic regions are especially vulnerable to these biohazards because of the massive seasonal transboundary and interregional migration of wildlife that includes more than 250 migratory species. Many of these animals are also commonly used for the traditional diet of Arctic Indigenous populations (e.g., ducks, geese, bird eggs, salmon, arctic char, freshwater eels, marine mammals, reindeer/caribou, etc.). These species migrate up to 5000 km annually, mainly latitudinally, for breeding and foraging in the Arctic regions. Contributing to the severity of the problem are the ongoing and expected climate changes affecting the migration

routes, seasonality and breeding areas for insects, fish, birds, and mammals, with increasing evidence that this introduces new vectors of disease.

Birds frequently carry pathogens; endoparasites such as *Toxoplasma gondii*, ectoparasites like ticks and fleas, viruses such as tick-borne encephalitis and influenza and bacteria causing Lyme disease and tularemia, to name but a few. Wild bird species can also be vectors for other zoonotic pathogens such as Salmonella, Campylobacter and *Mycobacterium avium* and spread these to humans directly or through poultry. Wild migratory fishes can transmit to humans a range of parasites such as roundworms (nematodes), flatworms or flukes (trematodes) and tapeworms (cestodes) as well as some bacteria (e.g., *Listeria*, *Aeromonas hydrophila*).

Arctic-breeding migratory animals constitute an important component of Arctic traditional diets and thus may simultaneously be a source of human exposure to bio-accumulative environmental pollutants and pathogens. Pollutants such as mercury, DDTs, and PCBs can suppress the immune system and hence reduce resistance against pathogens (an issue that is addressed under the current AMAP human health assessment work). Improving understanding of wild bird and fish migration patterns and transmissible infectious diseases can help predict and prepare for future outbreaks and epidemics.

Fast-thawing permafrost is another Arctic-specific phenomenon that may release a range of bacterial spores and viruses preserved in frozen ground. Climate warming can cause the remobilization of (paleo) pathogens and biological toxins from legacy waste sites and buried carcasses. It has been documented that thawing permafrost is capable of releasing paleo pathogens such as the spore-forming bacterium *Bacillus anthracis*, Variola virus (smallpox), *Mycobacterium tuberculosis* etc. with extremely long viability (up to 30000 years). Climatic changes may also benefit free living bacteria and parasites whose survival and development are limited by temperature. Currently, agencies and organizations that are authorized to monitor zoonotic diseases, and other biohazards are not sufficiently integrated to address emergency issues. For example, the SARS-CoV-2 pandemic shows that information on risk of regional and global transmission to humans of highly virulent infections is incomplete or not readily available.

A methodology for monitoring, assessing and predicting the risk of spreading virulent pathogens in the Arctic is so far not sufficiently developed.

AMAP Objective(s) and Policy-relevant Science Questions

Potential PRSQs that could be addressed under the proposed activity/project:

Is it possible to devise a monitoring network in the Arctic that could avoid contagion with pathogens of pandemic potential both in and outside the Arctic?

AMAP Strategic Goals addressed in the proposal:

- ☒ *Strategic Goal 1: Improved knowledge and understanding of Arctic change through collaborative assessment processes, for use in evidence-based decision-making*
- ☒ *Strategic Goal 2: A strong, sustained and coordinated circumpolar monitoring and observation network*
- ☒ *Strategic Goal 3: Enhanced understanding of Arctic change and its impacts through inclusive partnership with Indigenous Peoples and local residents*

- ☐ *Strategic Goal 4: Effective communication on Arctic challenges and global implications*
- ☐ *Strategic Goal 5: Support relevant international processes*

Arctic Council Strategic Goals addressed in the proposal:

- ☐ *Goal 1 – Arctic Climate*
- ☒ *Goal 2 – Healthy and Resilient Arctic Ecosystems*
- ☒ *Goal 3 – Healthy Arctic Marine Environment*
- ☐ *Goal 4 – Sustainable Social Development*
- ☐ *Goal 5 – Sustainable Economic Development*
- ☐ *Goal 6 – Knowledge and Communications*
- ☐ *Goal 7 – Stronger Arctic Council*

Tasks/Implementation Activities:

Conceptual framework and stepwise implementation:

Building on previous human and wildlife health work this activity would start by taking stock of the current knowledge, including indigenous knowledge, on relevant and potential Arctic pathogens. This knowledge will then be used to develop a harmonized monitoring program across the Arctic states taking into consideration the knowledge and the needs of Indigenous Peoples. The resulting work will be integrated into AMAP's efforts in the One Health domain and could potentially form the basis for an assessment and feed into international processes for global health.

Tasks/component activities, pre-requisites, dependencies, etc.:

1. To identify the status of endemic zoonotic diseases of potential concern in the Arctic.
2. To identify migratory species of wildlife capable of transferring pathogens into the Arctic with special focus on those consumed by indigenous people in their traditional diet or used in other cultural practices.
3. To assess the spread of risks related to the remobilization of viable paleo-pathogens from the thawing permafrost soils due to global warming.

Planned conferences/workshops/project meetings:

A series of project meetings will be held during the duration of the activity.

Inclusion/involvement/contribution by Permanent Participants (as per checklist below):

The involvement of Permanent Participants is essential to all stages of the activity.

Synergies and collaboration with activities of the other Arctic Council working groups and/or other partners and stakeholders:

The proposed activity would be conducted under the auspices of AMAP as a component of its assessment work connecting climate, contaminants, wildlife and human health, and closely linked to work under the AMAP HHAG on immunosuppressive effects of contaminants.

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Linkages would be made to One Health activities of SDWG and the resulting outcome will be of potential interest to SDWG.

It is also possible that EPPR might want to examine and give input to the implementation of the monitoring programme.

The One Health implication of this project fall within the interest of CAFF in connection with their work on migratory species.

Provisional Timeline, Milestones and Deliverables:

Provisional timeline listing major milestones and/or critical decision points:

Delivery of scoping report and recommendations: 2025

Possible coordination events (EG/project group meetings, format):

Possible workshop; virtual/hybrid project group meetings

(potential) Deliverables:

White paper and/or technical report on the above mentioned topics, including proposals for a possible monitoring programme and associated needs; building on, *inter alia*, the scientific article prepared as an outcome of the Sandbjerg workshop.

Targets for input to international processes:

WHO - One Health

Responsible EG/Lead country/Team leads

Project group building on experts that expressed an interest in this topic at the Sandbjerg workshop; linkages to HHAG

Permanent Participants engagement

Have Permanent Participants been engaged in the development of the project proposal?

- ☒ *Yes (please describe how): PPs were involved in the precursor of this activity called "SDWG-AMAP Biosecurity"*
- ☐ *No (please describe why):*

Observer engagement

Are there specific plans for observer engagement?

- ☐ *Yes (please describe):*
- ☐ *No*
- ☒ *To be determined (please explain): During the organization of the initial meeting(s) it will become clear if there is a need for observer engagement. Zoonoses are widespread and it is highly likely that such engagement will be initiated.*

Estimated budget/resource requirements:

[If possible/relevant, provide a provisional estimate of financial and/or other resource requirements associated with the activity/project or its component parts.]

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Potential costs associated with expert engagement in project work and related coordination activities.

New methodologies and approaches to monitoring Arctic contaminants and their effects

Activity/project type:

- ☐ New assessment
- ☐ Update assessment
- ☒ Technical product(s)
- ☒ Scoping activity
- ☒ Workshop/event
- ☐ Outreach event (specify target(s)):
- ☐ Other (describe):

Project/Activity Proposed/Supported by:

Proposal developed by:

AMAP Secretariat (follow-up to discussions held at KoD/Canada coordinated 2023 ‘Sandbjerg workshop’)

Summary description

The proposed project would involve a scoping/review activity to consider possible new approaches to monitoring and assessing contaminants and their impact on wildlife and human health that could potentially be incorporated in future AMAP monitoring and assessment work. This would complement ongoing and planned work to update the current *AMAP trends and effects monitoring programme* as a specific activity focusing on new methods/approaches rather than adjustments to existing programme specifications.

Background, scope and rationale

AMAP’s “trends and effects monitoring programme” was originally developed to meet the needs of AMAP in connection with its initial (1998) assessment of the State of the Arctic Environment; it defines an “ideal” programme that countries would hopefully implement in a harmonised manner. It was subsequently updated in 2004, and some parts have been added/adjusted/refined since that time (e.g., for monitoring of litter and microplastics). The AMAP Trends and Effects Monitoring Programme addresses monitoring of environmental contaminants but has only very limited content relating to monitoring (essential) climate variables (mostly restricted to climate effects monitoring). Essentially therefore, the core AMAP monitoring programme has had little consideration with respect to new monitoring approaches, or new assessment approaches and their associated information requirements, since it was first outlined.

New Approach Methods are now of regulatory interest in several member states, including EU, Canada, and USA, and thus it would be prudent to understand how this may influence contaminants work in the Arctic region. Work is currently ongoing/planned to update parts of

the existing contaminants monitoring programme (e.g., under the POPs and mercury EG implementation activities) and some national monitoring programmes (e.g. NCP) are also being reviewed. Also, AMAP has been considering steps to better integrate its monitoring and assessment work related to contaminants-wildlife health and human health.

A workshop co-convened by KoD and Canada, included presentations and discussion of both new approaches to monitoring/assessment that may be of interest to AMAP, as well as consideration of new issues that might warrant new monitoring components (e.g., zoonosis – see separate proposal template). One outcome of the workshop was a proposal that AMAP establish a ‘task group’ to review new approaches for monitoring contaminants and their effects on wildlife and humans and to consider their possible application in relation to AMAP work, with the goal of preparing recommendations for further consideration by AMAP HoDs. Several experts participating in the workshop expressed their interest in participating in such an activity.

AMAP Objective(s) and Policy-relevant Science Questions

Potential PRSQs that could be addressed under the proposed activity/project:

Are there new approaches to monitoring and assessment that should be considered by AMAP for adoption and/or inclusion in its coordinated *AMAP Trends and Effects Monitoring Programme* to provide the knowledge base required for future AMAP assessment needs?

AMAP Strategic Goals addressed in the proposal:

- ☒ *Strategic Goal 1: Improved knowledge and understanding of Arctic change through collaborative assessment processes, for use in evidence-based decision-making*
- ☒ *Strategic Goal 2: A strong, sustained and coordinated circumpolar monitoring and observation network*
- ☒ *Strategic Goal 3: Enhanced understanding of Arctic change and its impacts through inclusive partnership with Indigenous Peoples and local residents*
- ☐ *Strategic Goal 4: Effective communication on Arctic challenges and global implications*
- ☐ *Strategic Goal 5: Support relevant international processes*

Arctic Council Strategic Goals addressed in the proposal:

- ☐ *Goal 1 – Arctic Climate*
- ☒ *Goal 2 – Healthy and Resilient Arctic Ecosystems*
- ☒ *Goal 3 – Healthy Arctic Marine Environment*
- ☐ *Goal 4 – Sustainable Social Development*
- ☐ *Goal 5 – Sustainable Economic Development*
- ☐ *Goal 6 – Knowledge and Communications*
- ☒ *Goal 7 – Stronger Arctic Council*

Tasks/Implementation Activities:

Establish the proposed task team to scope/review new approaches for monitoring contaminants and their effects on wildlife and humans and consider their possible application

in relation to AMAP work, with the goal of preparing recommendations for further consideration by AMAP HoDs.

Permanent participants should be involved in the proposed Task Team to, *inter alia*, provide input on assessment needs and, e.g., potentials of community-based monitoring in relation to proposed new approaches.

Provisional Timeline, Milestones and Deliverables:

Provisional timeline listing major milestones and/or critical decision points:

End-2024/early-2025: Establishment of Task Team

2025: Compilation of relevant information, review and development of recommendations.

Possible coordination events (EG/project group meetings, format):

Virtual meetings to facilitate the planning and implementation of the project work.

A (hybrid) workshop to facilitate discussion of approaches for monitoring contaminants and their effects on wildlife and humans, building on the information presented at the Sandbjerg workshop.

(potential) Deliverables:

A report with recommendations for review by AMAP HoDs as part of their consideration of AMAP monitoring activities to meet assessment needs.

Responsible EG/Lead country/Team leads

Independent Task team including experts engaged in AMAP Mercury, POPs and Human Health EGs; possible leadership from experts identified at Sandbjerg workshop.

Permanent Participants engagement

Have Permanent Participants been engaged in the development of the project proposal?

- ☒ *Yes (please describe how):* Some PP representatives participated in the Sandbjerg workshop and indicated interest in Task Team activity.
- ☐ *No (please describe why):*

Observer engagement

Are there specific plans for observer engagement?

- ☐ *Yes (please describe):*
- ☐ *No*
- ☒ *To be determined (please explain):* Observers may wish to contribute to the project activity.

AMAP Workplan Implementation 2025-2026

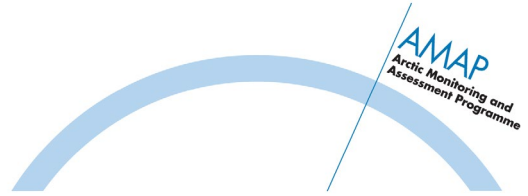
Implementing AMAP work to address Contaminants, Wildlife and Human Health

(version May 2025)

Estimated budget/resource requirements:

[If possible/relevant, provide a provisional estimate of financial and/or other resource requirements associated with the activity/project or its component parts.]

Potential costs associated with expert engagement in project work and related coordination activities.



Cross-cutting Issue: Short-lived Climate Forcers in the Arctic

(version May 2025; approved June 2025)

AMAP Workplan Implementation 2025-2027

Implementing AMAP work to address SLCFs in the Arctic (version April 2025)

AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impacts on Arctic ecosystems and human populations.

The table below presents a detailed stepwise plan for implementing AMAP work to address **Short-lived Climate Forcers (SLCFs) in the Arctic**. This plan has been developed from related 'one-pager' project activity proposals that were developed in 2023 by the AMAP SLCF Expert Group Leads, with the AMAP Secretariat and tracking HoDs (see Annex). These 'one-pagers' are intended to help advance project-level work under the most recently approved AMAP WorkPlan and according to the *AMAP Strategic Framework 2019+*, including its guiding principles and strategic goals.

The implementation activities described below will be carried out by the AMAP Expert Group(s) with the support of the AMAP Secretariat, under the direction of AMAP HoDs and PPs, and in a manner that is consistent with **current Arctic Council guidelines for resumption of Working Group work**.

These activities will support / contribute to the following AMAP Projects (as per AMAROK):

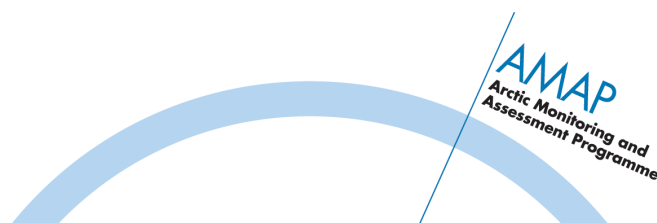
- Short-lived Climate Forcers (SLCFs) - Climate and Air Pollution;
- Human Health and combined effects;
- Implementing AMAP Contaminant Trends and Effects Monitoring Programme;
- Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC)
- Participation in international workshops, conferences;
- Efforts to engage PPs in AMAP's work.

The key AMAP products and deliverables planned for 2025-2027 in relation to AMAP work to address **SLCFs in the Arctic** are:

- Technical reports;
- Summary for Policy-makers (TBC);
- Updated monitoring programme;
- Outreach at international scientific conferences.

This implementation plan is intended to be updated on a biannual basis (approximately January and July), or as needed, as determined by AMAP HoDs.

Content added since the version approved by AMAP HoDs in September 2024 is indicated with yellow highlighting.



AMAP Workplan Implementation 2025-2027

Implementing AMAP work to address SLCFs in the Arctic (*version April 2025*)

A. Background:

Short-lived climate forcers (SLCFs) include greenhouse gases, particles, and other air pollutants that strongly influence climate but have a relatively short atmospheric lifetime compared to carbon dioxide. Some SLCFs and co-emitted air pollutants impact air quality with consequences for human health and ecosystem health. SLCFs were identified by AMAP in 2009 as an 'issue of concern', and AMAP assessments delivered between 2011 and 2015 initially focused on climate impacts of black carbon and methane. This work highlighted the potential impact of black carbon on surface albedo when deposited on ice and snow, as well as potential releases of methane associated with permafrost thaw. Recent, AMAP assessments of SLCF Impacts on Arctic Climate, Air Quality, and Human Health (delivered in 2021) have addressed SLCFs and co-emitted species in a more integrated manner when considering trends and (modelling) addressing future scenarios for emissions and related climate and air quality projections. AMAP's work on SLCFs is organized under AMAP's SLCF expert group (EG), and is coordinated internally with, in particular, AMAP climate, and externally with work under the Arctic Council ACAP WG and Expert Group on Black carbon and Methane (EGBCM). The establishment of the AC EGBCM was a response to AMAP SLCF assessments that called for urgent reductions in emissions of SLCFs to complement reduction in emissions of carbon dioxide.

In addition to informing the Arctic Council and its member states and Permanent Participants, AMAP assessment and data products concerning SLCFs provide an important contribution to international processes that address action to mitigate climate change and improve air quality. These include work under the UN ECE Air Convention (Gothenburg Protocol); IMO (work to address black carbon emissions from shipping); EU Arctic Policy (including the EU Action on Black Carbon Impacting the Arctic, and related EU-funded projects (EUA-BCA and ABC-iCAP) co-led by AMAP Secretariat), as well as work under the UNFCCC and IPCC and current UN initiatives to link Conventions dealing with climate change, biodiversity and pollution.

AMAP's work on SLCFs has also addressed the role of wildfires as sources of black carbon and other contaminants, highlighting the climate feedbacks associated with increasing occurrence and intensity of Arctic wildfires, work that is related to the AMAP-CAFF joint project on *climate change impacts on Arctic ecosystems and associated climate feedbacks* and the Norwegian Chairship Initiative on Wildland fires.

B. AMAP's SLCFs implementation plan – Overview of Implementation Activities

1. Knowledge synthesis – Methane trends and Arctic climate response (*see Annex: one-pager*)

Rationale and description:

Methane is a potent short-lived climate forcer. AMAP's 2021 SLCF assessment concluded that global anthropogenic emissions of methane and levels of methane in the Arctic atmosphere continue to increase. Limiting near-term Arctic and global temperature increases requires ambitious methane emission reductions. Arctic states have committed¹ to significantly reduce their overall methane emissions, and most also support the 'Global Methane Pledge'².

With no evidence of a significant decrease in anthropogenic methane emissions, and with potential for increased emissions from thawing permafrost, understanding how Arctic methane sources and atmospheric methane concentrations are changing is key to evaluating the potential impacts of the Global Methane Pledge and the individual commitments of Arctic nations.

¹ Arctic Council's Framework for Action for Enhanced Black Carbon and Methane Emissions.

² The 'Global Methane Pledge' - to cut global methane emissions by 30% by 2030, relative to 2020 levels - was launched at the UNFCCC COP26 in November 2021; more than 150 countries are participating.

AMAP Workplan Implementation 2025-2027

Implementing AMAP work to address SLCFs in the Arctic (*version April 2025*)

Models will be further developed and applied to understand trends in atmospheric concentrations of methane relative to Arctic sources (natural and anthropogenic) and to evaluate the potential outcomes of the 'Global Methane Pledge' for Arctic climate. The resulting knowledge synthesis will extend the work conducted under the AMAP 2021 SLCF assessment to address identified Policy-relevant science questions (PRSQs) (see one-pager). Additional modelling work could also consider the climate response to nationally determined contributions (NDCs) as part of the UNFCCC 'global stocktake' process; results would be required during 2025 to target consideration of NDCs at COP30.

Progress will need to be periodically reviewed to evaluate the extent to which relevant PRSQs can be answered and/or what additional knowledge is still required; this will determine the timeline for potential deliverables associated with work addressing methane.

Progress to-date:

Work has been performed under external activities to develop updated scenarios for methane emissions linked to the Methane Pledge (IIASA), and to apply improved models to evaluate the potential impact of resulting emissions reductions. The modelling work includes the NCM-supported project Reduc(h4)e, and CMIP-related activities such as Methane-MIP. Several AMAP SLCF EG experts and key partners involved in the AMAP 2021 assessment work are engaged in these activities. In agreement with the NCM, work under the Reduc(h4)e project will be delivered through the AMAP SLCF implementation activity on methane. AMAP's work on methane informs work under the EGBCM. AMAP Secretariat has held discussions with CCAC regarding potential collaboration on outreach connected with methane issues; CCAC will launch their Global Methane Status Report in October and there are plans for a high level methane event at COP-30. Methane emulator development is also a potential topic for SLCF scientific collaboration going forward.

2. Supplement to recent knowledge synthesis – ongoing importance of black carbon on Arctic climate forcing (*see Annex: one-pager*)

Rationale and description:

The recent IPCC AR6 report estimated a globally-averaged radiative forcing estimate for black carbon that is significantly lower than estimates published in earlier major synthesis reports, including the AMAP 2021 assessment. Additionally, the IPCC AR6 report demoted black carbon from the third largest contributor to climate warming after CO₂ and methane, and grouped it with other aerosols which are discussed as climate cooling agents.

Scientific publications (e.g. <https://www.nature.com/articles/s43247-022-00555-x>) have endeavored to clarify the interpretation of the radiative forcing estimate for black carbon and the continuing importance of action on black carbon to the Arctic environment, however the visibility of the scientific communication is limited and there is a need to update of the communication to policy-makers in the Arctic and globally to avoid potential confusion in messaging regarding the need for reducing emissions of black carbon and its relationship to other GHGs and SLCFs.

The implementation activity will involve recalculation of the Arctic radiative forcing for black carbon, ideally comparing it in terms of magnitude of importance to CO₂, methane, and other SLCFs, as a basis for an updated communication to the Arctic Council and IPCC, and to inform the work of the EGBCM.

Progress to-date:

The scientific work conducted to date provides a basis for an updated communication to clarify the role of black carbon. AMAP Secretariat has been in dialog with external groups (including CCAC, Clean Air Fund and ICCI) to discuss potential areas for collaboration or coordination of work. A scientific project to develop an emulator for use in guiding BC policy work is being developed with CAF and involving AMAP SLCF expert groups from Denmark, Sweden and Norway

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Implementing AMAP work to address SLCFs in the Arctic (*version April 2025*)

as well as United Kingdom. Work is ongoing to develop a policy-communication (SPM) addressing issues around messaging concerning BC radiative forcing during the first half of 2025. As well as intended use to inform work under the EGBCM there is potential for collaboration with CCAC on outreach concerning products of this work.

3. Updating AMAP trends and effects monitoring programme (ATEMP) (*see Annex: one-pager*)

Rationale and description:

AMAP implements a coordinated programme for monitoring contaminants and their effects in the Arctic – the AMAP Trends & Effects Monitoring Programme (ATEMP). The AMAP programme is based largely on national monitoring and research activities. AMAP defines a set of core activities that it encourages countries to adopt as part of their AMAP national implementation plans and conducts work to harmonize monitoring and related activities (data management, etc.), including harmonization with overlapping international monitoring under e.g. EMEP, OSPAR, etc. The ‘guidelines’ for monitoring of air pollutants including radiatively important trace species under the AMAP Trends & Effects Monitoring Programme last received a comprehensive update in 2004. The AMAP WG has identified updating of AMAP monitoring programme as a priority activity in its workplan and charged the Secretariat with developing a plan to accomplish this work. Planned work includes reviewing methods currently used to quantify ‘black carbon’. Improved monitoring of methane emissions, including methane releases from thawing permafrost, is a priority, and new methods based on remote sensing need to be reflected in the AMAP monitoring programme.

Progress to-date:

Work conducted under the (external) ABC-iCAP project to evaluate the Arctic monitoring network for black carbon and co-emitted species and make recommendations that could be considered by AMAP.

A workshop on ‘coupled monitoring for the Arctic terrestrial environment’ held in October 2024 and followed-up with a second workshop in March 2025 is expected to provide input to the activity to update the AMAP monitoring programme.

Work to review and update the current AMAP monitoring programme has not yet started and has been rescheduled for implementation in 2025.

4. Knowledge synthesis - Wildfire impacts on the Arctic: emissions, climate response and health impact (*see Annex: one-pager*)

Rationale and description:

AMAPs 2021 Assessment of impacts of SLCFs on Arctic climate air quality and human health addressed open biomass burning (wildfires and agricultural burning) focusing on their importance as a source of black carbon emissions impacting the Arctic, and on changes in fire regimes as a consequence of climate change. Increases in the extent, intensity and (health) consequences of boreal and peatland fires has elevated concerns about their (Arctic) climate and air pollution impacts.

Planned AMAP SLCF work on open-burning (wildfires and open agricultural burning) aims to address key knowledge gaps relating to the anticipated frequency and severity of wildfires as well as the impact of wildfire emissions on air quality and Arctic climate. Work under consideration includes assessing fuel loads (fuel type mapping and reviewing associated fuel EFs) as a key factor for improving estimates of emissions of black carbon (and other pollutants including bioaerosols, mercury and PAHs); smoke transport modelling to underpin human health impact assessments; and the development of new pathways and scenarios for fires, to support (Arctic and global) climate and air pollutant modelling initiatives.

AMAP Workplan Implementation 2025-2027

Implementing AMAP work to address SLCFs in the Arctic (*version April 2025*)

Progress to-date:

Work conducted under the (external) ABC-iCAP project provides a basis for further activities relating to estimation of fire emissions and development of future pathways for fire scenarios.

AMAP work contributes to the Norwegian Chairship wildland fire initiative and has delivered outreach in that context (e.g. at ASSW 2024). The report on the outcomes of the wildland fire initiative is being finalized and will be circulated to AMAP HoDs (April 2025); HoDs have also been informed about possible developments under the AC to establish a wildfire coordination group under EPPR.

A large number of wildfire-related initiatives are ongoing including work under the AMAP-CAFF project, Air Convention (HTAP), etc. and work has been undertaken to track relevant activities with a view to coordinating future work and avoiding duplication.

5. AMAP support for work of EGBCM

Rationale and description:

AMAPs work on SLCFs led to the establishment of the Arctic Council's and provided scientific knowledge to underpin the work of the EGBCM.

As work under the EGBCM resumes AMAP will align its activities to support new needs identified by the EGBCM.

Progress to-date:

Work on emissions data compilation conducted under the (external) ABC-iCAP project was communicated to the EGBCM on a webinar in April; the draft AMAP SLCF implementation plan has also been provided to the EGBCM for internal discussions.

The EGBCM has expressed interest in parts of the proposed AMAP work and this was further discussed by the EGBCM HoDs during their meeting on 18/19 September. In preparing for their meeting, the EGBCM posed the following questions to the AMAP SLCF-EG:

- 1a. Is the downward revision of the global radiative forcing from BC highlighted in the IPCC's AR6 report representative for the Arctic?
- 1b. What are the underlying uncertainties in the net climate effect of [sector] sources of BC emissions in the Arctic?
- 2a. When targeting sources of BC-emissions, which sectors have the highest net climate benefit? (Taking the co-emitted species into account).
- 2b. Are there any source where the health effect is higher (Taking the co-emitted species into account)
3. What alternative target metrics could be further explored based on existing AMAP work? Is it possible to determine what nature of target would be the most efficient (i.e. just BC or with co-emitted species, focus on specific sectors) to maximize climate benefits?
4. Present projections of BC through 2035, and not just look at total BC % change, but changes in sectors with high net climate effect and changes in total PM2.5 and in OC.
5. Present modelling to help understand what the world will look like in 2035 in terms of BC and co-emitted species. Arctic States have not reported on co-emitted species (GHG and other pollutants), but scenarios developed by AMAP with existing modelling data can assist in setting the goal.

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Implementing AMAP work to address SLCFs in the Arctic *(version April 2025)*

6. Implications of the Global Methane Pledge in the Arctic both in terms of emissions and rate of warming
7. Does AMAP have recommendations on which sectors the AC member States should focus on to most effectively accelerate reductions of methane emissions in the Arctic?
8. The latest science on methane super-emitter events, and the natural sources of methane in relation to warming and permafrost thaw.

AMAP experts provided responses to the questions posed by the EGBCM, to the extent possible, based on AMAP's 2021 assessment results and some more recent studies. Additional information required to answer questions from the EGBCM will be taken into account in planning the future work of the SLCF-EG.

Outcomes of discussions within the EGBCM will be communicated to AMAP HoDs for their consideration in possible further development of this track to the SLCF EG implementation plan or future AMAP workplan.

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address SLCFs in the Arctic (version April 2025)

Implementation activities – Timelines and Tasks					
	Methane: atmospheric trends, emissions trends, and climate implications / Knowledge synthesis - Methane trends and Arctic climate response	Supplement to recent knowledge synthesis - ongoing importance of black carbon on Arctic climate forcing	Updating AMAP monitoring programme	Knowledge synthesis - Wildfire impacts on the Arctic: emissions, climate response and health impact	AMAP support for work of EGBCM
Timing	Tasks	Tasks	Tasks	Tasks	Tasks
January-December 2024	See archived record of implementation work in 2024				
January – March 2025		<u>Milestones/Products:</u> Consultations with experts; Drafting of SPM			
April 2025	<u>Milestones/ Products:</u> EG co-leads: Presentation of results of scientific work at EGU; Scientific journal publications	<u>Milestones/Products:</u> Circulation of first draft SPM to THoDs; Redrafting		<ul style="list-style-type: none"> EG Leads/Secretariat: Consider coordination issues with HTAP and other wildfire related work; possible coordination with work under AMAP CEG and AMAP-CAFF project 	
May 2025	<ul style="list-style-type: none"> HoDs/PPs/EG Leads/Secretariat: Consider timeline for developing an AMAP technical report on methane trends and Arctic climate and related SPM deliverable 			<ul style="list-style-type: none"> Secretariat/EG Leads/Tracking HoDs: Consider outcomes of AC wildfire initiative and possible plans for continued work of AC WGs in this area HoDs/PPs/Secretariat: Implement work to identify experts to participate in activity 	<ul style="list-style-type: none"> HoDs/PPs/EG Leads/Secretariat: Consider outcomes of 2025 EGBCM Report to SAOs and any related requests for AMAP support
June 2025		<u>Milestones/Products:</u> SPM finalization and production; Development of C&O plan (targeting AC, IPCC, etc.)	<ul style="list-style-type: none"> HoDs/PPs/Secretariat: Implement work to identify experts to participate in activity EG leads/Secretariat: Establish SLCF project group and convene project group 	<ul style="list-style-type: none"> HoDs/PPs/EG Leads/Secretariat: Consider whether to develop an AMAP technical update report on emissions from wildfires, air pollution and 	

AMAP Workplan Implementation 2025-2027

Implementation Plan for AMAP work to address SLCFs in the Arctic (version April 2025)

Implementation activities – Timelines and Tasks					
	Methane: atmospheric trends, emissions trends, and climate implications / Knowledge synthesis - Methane trends and Arctic climate response	Supplement to recent knowledge synthesis - ongoing importance of black carbon on Arctic climate forcing	Updating AMAP monitoring programme	Knowledge synthesis - Wildfire impacts on the Arctic: emissions, climate response and health impact	AMAP support for work of EGBCM
Timing	Tasks	Tasks	Tasks	Tasks	Tasks
January-December 2024	See archived record of implementation work in 2024				
			meeting(s) to organize AMAP programme update activity	climate impacts, health impacts, etc. and related SPM deliverable	
July-Dec 2025	<u>Milestones/Products:</u> <ul style="list-style-type: none"> • Reduc(h4)e project report • Potential technical report and SPM deliverable (including reporting on final results of Reduc(h4)e project work) • Presentation(s) of SPM at COP-30? 		<ul style="list-style-type: none"> • AMAP HoDs/PPs: Facilitate project group meeting(s) – logistics/resources/expert participation <u>Milestones/Products:</u> <ul style="list-style-type: none"> • Draft (SLCF) monitoring programme update for review by HoDs/PPs. <u>Milestones/Products:</u> <ul style="list-style-type: none"> • Updated AMAP monitoring programme 	<u>Milestones/Products:</u> <ul style="list-style-type: none"> • Potential technical report and SPM deliverable 	
Jan-Jun 2026	<ul style="list-style-type: none"> • AMAP HoDs/PPs/EG Leads/Secretariat: Development and delivery of technical reports, possible SPM, updated monitoring programme³ 				

³ POSSIBLE WRITTEN PROCEDURE TO APPROVE SPM, UPDATED MONITORING PROGRAMME, OUTREACH PLAN AND PRODUCTS, ETC

Annex: Implementation activity ‘one-pagers’¹

<p>Implementation Activity: Knowledge synthesis – Methane trends and Arctic climate response</p>
<p>Relates to AMAP objectives: Air Pollution, including SLCFs; Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC). Informing Arctic nation responses to: green-house gas (GHG) and air pollution mitigation net zero goals; SLCFs - climate and air quality/air pollution impacts.</p>
<p>AMAP Experts: AMAP SLCF EG; Connects to work of AMAP CEG, including components of AMAP-CAFF joint assessment of climate impacts on Arctic ecosystems and associated feedbacks</p>
<p>Science Policy Questions: (<i>updating responses provided in 2021 report</i>)</p> <ol style="list-style-type: none"> 1. How are major Arctic and non-Arctic methane emission sources changing (e.g.: oil and gas, agriculture, and waste), and how are they expected to continue changing looking forward in the mid- (2050) to long-term (to 2100)? 2. What is the anticipated Arctic and global climate response to the release of methane from: anthropogenic Arctic and non-Arctic sources; and from thawing permafrost (terrestrial and marine) and wetlands? What research and monitoring is needed to reduce uncertainties in these estimates? 3. Are the natural and anthropogenic emission signals evident in the Arctic atmospheric methane observations? How well does current atmospheric monitoring capture emission hot spots, and contribute to tracking progress in emission reductions? What monitoring is required to capture these signals (i.e.: surface in-situ, fluxes, satellite based)? 4. How do Arctic nation methane emissions contribute to global emission pathways consistent with limiting global average warming to 1.5C, 2 and 4C, including overshoot scenarios? What are the major limitations in earth system models for understanding Arctic climate responses to Arctic and global methane source changes? 5. Are there air quality implications for increasing methane emissions in the Arctic? How do these impact human and ecosystem health in the Arctic?
<p>Rationale: AMAPs 2021 Assessment of impacts of SLCFs on Arctic climate air quality and human health investigated multi-pollutant impacts by applying (17) Earth System and chemical transport models to a set of specially developed emissions scenarios for GHGs, SLCFs and co-emitted air pollutants. AMAPs 2021 SLCF assessment set the stage for updated work on methane, leveraging the EG SLCF work on emulator-based modelling and future scenarios analysis. Limiting near term Arctic and global temperature increases requires ambitious methane emission reductions. Understanding how Arctic methane sources and atmospheric methane concentrations are changing is key to evaluating the potential impacts of the Global Methane Pledge and the individual commitments of Arctic nations (NDCs).</p>
<p>Short description of tasks: To extend the work conducted under the AMAP 2021 SLCF assessment to further develop/apply models to evaluate the potential outcomes of the ‘Global Methane Pledge’ for Arctic climate. Understand trends in atmospheric concentrations of methane relative to Arctic sources (natural and anthropogenic).</p>
<p>Timing: 18-36 months (2024-2027), responsive to Norwegian chairship priorities and aligned with timing of anticipated research results from HTAP, CMIP7 and other multi-lateral research initiatives.</p>
<p>Product(s):</p> <ul style="list-style-type: none"> • Short technical report on atmospheric trends and emissions trends (rate, source distribution), impact of Arctic and global methane sources on Arctic climate, and implications for AMAP Methane and global NDC commitments. • Data products (updated emissions estimates, future emission scenarios, model simulations and projections, for use by the global scientific community and in future AMAP and EGBCM SLCF assessments) • Communication of policy-relevant findings to the AC (EGBCM), UNFCCC, and UN ECE Air Convention.
<p>Internal coordination: Engaging relevant AMAP experts from SLCF; coordination with CEG as appropriate; linkages to joint AMAP-CAFF assessment of climate change impacts on ecosystems, specifically emissions of methane</p>

The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex: Implementation activity ‘one-pagers’¹

from natural sources (permafrost thaw, etc.); identification of core group of authors. Overall technical report coordination by EG SLCF leads.
External coordination: EGBCM, ACAP; Coordination of planned AMAP work with NCM-funded Reduc(h4)e project (June 2023 – December 2024); Potential collaboration with IIASA (engaged in developing projections for future emissions of CH ₄ – and other GHGs/air pollutants - under various policy scenarios). Engagement with relevant UN bodies; EU ABC-iCAP initiative, CMIP7, Methane-MIP, etc.
Resources: AMAP expert engagement, supported by AMAP members ⁴ .
Priority: Alignment of work if relevant/possible with needs of UNFCCC and UN ECE Air Convention. SLCF follow-up identified in Norwegian AC Chairship priorities.

⁴ As part of the planning to secure implementation of AMAP-relevant work, NCM Climate and Air group (NKL) are supporting the NILU led project *‘Reduc(h4)e: The role and model representation of methane reductions for Arctic climate’* (documentation available). This project is a core activity to implement planned AMAP work, that can be complemented by related/coordinated work.

The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex: Implementation activity ‘one-pagers’¹

Implementation Activity: Supplement to recent knowledge synthesis – ongoing importance of black carbon on Arctic climate forcing.
Relates to AMAP objectives: <ul style="list-style-type: none"> • Climate and Air Pollution, including SLCFs. • Support for International Conventions (UN ECE Air, IPCC). • Informing Arctic nation responses to AP mitigation planning, climate adaptation and wildfire management. • Identifying possible causes for changing conditions and recommending actions to reduce risks to Arctic ecosystems and human populations.
AMAP Experts: SLCF EG
Policy Relevant Science Question(s): <ol style="list-style-type: none"> 1. Is it still the case that action on black carbon is crucial for to achieving climate goals? What are the explanations for differences in representation of BC radiative forcing in the AMAP 2021 assessment and the IPCC AR6 report? 2. In what geographic areas (if any) should action on black carbon be prioritized to help achieve climate goals? 3. How effective is action on black carbon compared to action on various SLCFs/GHGs? Regionally, would action on black carbon be considered as important/more important than action on other SLCFs/GHGs (ranking)?
Rationale: The recent IPCC AR6 report estimated a globally-averaged radiative forcing estimate for black carbon that is significantly lower than estimates published in earlier major synthesis reports (+0.11 Wm ⁻² (ERF), 0.18 Wm ⁻² (ERF including albedo) compared to + 0.4 Wm ⁻² RF in AR5). Additionally, this publication demoted black carbon from the third largest contributor to climate warming after CO ₂ and methane, and grouped it with other aerosols which are discussed as climate cooling agents throughout the Summary for Policy-Makers. A subsequent publication in Nature’s earth & environment communications from von Salzen et al. (2022) helped to clarify the ongoing importance of action on black carbon to the Arctic environment, however the visibility of this Nature publication does not have equal visibility to the AR6. The impact has been that is difficult to convince senior management of the ongoing importance of action on black carbon. It is being increasingly disregarded in international discussion on pathways to meeting/exceeding the Paris goal to limit warming to 1.5C, with focus moving solely to non-CO ₂ greenhouse gases. Scientific emphasis on the importance of action on all non-CO ₂ climate forcers including black carbon would therefore be helpful from a policy perspective.
Short description of tasks: Recalculated Arctic radiative forcing for black carbon, ideally comparing it in terms of magnitude of importance to CO ₂ , methane, and other SLCFs.
Timing: ~18 months (2024-2025) to discuss approach and produce an appropriate communications tool by the end of the Norwegian Chairship period.
Product(s): Short science policy document/SLCF report update/SLCF report supplement
Internal/External coordination: Engage relevant AMAP experts from SLCF group to identify appropriate approach/product. Engage with IPCC representatives; Consider results of socio-economic analysis work under ABC-iCAP project?
Resources: AMAP expert engagement, supported by AMAP members.
Priority: Policy makers need a clear and unified statement from Arctic SLCF experts that action on black carbon in/near the Arctic and other snow-covered areas (such as mountain glaciers) remains a priority for addressing Arctic (and global) climate change in the near-term.

The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex: Implementation activity ‘one-pagers’¹

Implementation Activity: Updating the programme for monitoring of contaminants under the AMAP Trends & Effects Monitoring Programme, including related documentation
Relates to Project(s): Implementing AMAP Contaminant Trends and Effects Monitoring Programme
AMAP Experts: SLCF EG, CEG, POPS/CEAC EG; Mercury EG; etc.
Policy Relevant Science Question(s): What are the sources, levels, trends and effects of SLCFs in Arctic air and their effects on climate and human health?
Rationale: AMAP implements a coordinated programme for monitoring contaminants and their effects in the Arctic – the AMAP Trends & Effects Monitoring Programme (ATEMP). The AMAP programme is based largely on national monitoring and research activities. AMAP defines a set of core activities that it encourages countries to adopt as part of their AMAP national implementation plans and conducts work to harmonize monitoring and related activities (data management, etc.), including harmonization with overlapping international monitoring under e.g. EMEP, WMO, etc. The ‘guidelines’ for monitoring of contaminants under the AMAP Trends & Effects Monitoring Programme were originally developed in the 1990s; they were subject to a comprehensive update in 2004 but since then have become outdated, only some parts have been maintained. Documentation is in largely the form of ‘text documents’ and efforts to update materials over the past 10 or more years have not been followed through. The AMAP WG has identified updating of monitoring guidelines as a priority activity in its workplan, and charged the Secretariat with developing a plan to accomplish this work.
Short description of tasks: Modernizing the AMAP contaminants monitoring programme and updating related documentation and guidelines
Timing: Work scheduled during 2024-2025.
Product(s): Updated ‘guidance’ established through an online web-based platform, with a focus on updating the descriptions of core monitoring activities and procedures for AMAP implementation with reference to relevant (external) documentation and SOPs, etc. The update would address in particular QA/QC aspects and cover both sampling and laboratory procedures as well as data flow aspects.
Internal coordination: Identify relevant experts from relevant AMAP EGs; Secretariat coordination of input and implementation of (web-based) documentation, etc
External coordination: Coordination with other relevant bodies regarding harmonization of monitoring guidelines and data management systems, etc. (EMEP, WMO, etc.)
Resources: Secretariat staff resources; financial resources for web-based solutions and possibly for consultant services to support this work;
Priority: High
Issues to be resolved: Expert engagement and commitment; design of web-based documentation system

The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex: Implementation activity ‘one-pagers’¹

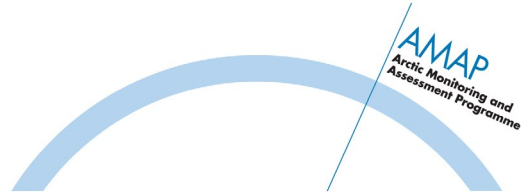
<p>Implementation Activity: Knowledge synthesis - Wildfire impacts on the Arctic: emissions, climate response and health impact</p>
<p>Relates to AMAP objectives:</p> <ul style="list-style-type: none"> • Climate and Air Pollution, including SLCFs • Support for International Conventions (Minamata, Stockholm, UN ECE Air, IPCC) • Informing Arctic nation responses to GHG and AP mitigation planning, climate adaptation and wildfire management
<p>AMAP Experts: SLCF EG with possible linkages to Climate EG, Mercury EG, POPs EG Complements the AMAP-CAFF joint assessment on climate change and ecosystems</p>
<p>Policy Relevant Science Question(s):</p> <ol style="list-style-type: none"> 1. How will [boreal/Arctic region wildfire emissions and impacts change under future climate scenarios? 2. What are the factors influencing emissions of SLCFs and other pollutants, and how do these relate to scenarios for future wildfire emissions. 3. What is the net Arctic climate impact of increasing wildfire emissions? (taking into account aerosols and GHGs, albedo change, feedbacks, etc.)? What is the related impact on human health? 4. What is the impact (e.g., on BC) of different fire management practices and/or fire management emission scenarios? (including both Indigenous- and contemporary fire management practices).
<p>Rationale: AMAPs 2021 Assessment of impacts of SLCFs on Arctic climate air quality and human health addressed open biomass burning (wildfires and agricultural burning) focusing on their importance as a source of black carbon emissions impacting the Arctic, and on changes in fire regimes as a consequence of climate change. Recent increases in the extent, intensity and (health) consequences of boreal and peatland fires has elevated concerns about their (Arctic) climate and air pollution impacts, resulting in many new proposed initiatives from Arctic Council groups and external bodies that need to be coordinated to avoid duplication and maximize synergies, including internal coordination between relevant AMAP EGs (especially the SLCF and Climate EGs). Planned AMAP SLCF work on open-burning (wildfires and open agricultural burning) would aim to address key knowledge gaps relating to the anticipated frequency and severity of wildfires as well as the impact of wildfire emissions on air quality and Arctic climate. Proposals include work to assess fuel loads and associated emission factors (EFs) as key issues for improving estimates of emissions of black carbon (as well as other fire generated pollutants such as bioaerosols, mercury and PAHs) and the development of new pathways and scenarios for fires, to support (Arctic and global) climate and air pollutant modelling initiatives that provide a basis for decision-making.</p>
<p>Short description of tasks: Development of data products and technical assessment products; resulting information would be communicated in scientific publications and technical reports products and used to inform assessments addressing climate and human health outcomes.</p>
<p>Product(s):</p> <ul style="list-style-type: none"> • Short technical report, state of knowledge assessment, on the changing magnitude and frequency of wildfires (under various climate scenarios, e.g.: 1.5C, 2C, 4C); the scale of GHG, AP, Hg and contaminant emissions; impact on air quality (ambient concentrations) and potential health risks. • Data products: Updated resources (e.g. multi-year Arctic fire mapping/fuel load/fire risk GIS resources) produced by AMAP 2021 SLCF EG in collaboration with relevant external activities; updated (multi-pollutant) emission estimates to support modelling initiatives within AMAP and external groups, and other AMAP assessment work.
<p>Timing: Over 18-36 months (2023 – 2027), responsive to Norwegian Chairship priorities (Wildland Fire Initiative) and aligned with timing of anticipated results from EU ABC-iCAP, PACES, HTAP and other multi-lateral research initiatives; in-person/hybrid SLCF expert/project group meetings to be convened as appropriate.</p>
<p>Internal coordination: Engage relevant AMAP experts from SLCF, CEG, Hg and POPs groups to identify core group of authors. Overall technical report coordination by EG SLCF leads. Linkages to work on climate feedbacks associated</p>

The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.

Annex: Implementation activity ‘one-pagers’¹

with ecosystem change under the joint AMAP-CAFF initiative. Potential linkages to AMAP Hg and POPs work on emissions from wildfires and open agricultural burning.
External coordination: Integration/coordination of planned AMAP work with related international groups including the HTAP (Air Convention group) and IGAC-BBURNED wildfire initiatives, scenario work (with IIASA/WMO/CMIP community, etc.) Engagement with relevant UN bodies; EU ABC-iCAP initiative, PACES community, etc.
Resources: AMAP expert engagement, supported by AMAP members. Engagement across Working Groups, in particular with respect to engagement of indigenous experts to ensure a complementary approach and resource leveraging. AMAP funding from the US could potentially be applied to a joint project with NASA to realize some of the planned data products.
Priority: Alignment of work across Arctic Council Working and Expert Groups; Alignment of work if relevant/possible with needs of UNFCCC and UN ECE Air Convention. SLCF follow-up identified in Norwegian AC chairship priorities.
Issues to be resolved: Further discussions on application of funding to proposed project work and planning development of AMAP products utilizing the results of this initiative.

The ‘one-pagers’ included in this annex are the current latest versions; any future updates or new information will be posted online and available via links provided in the main document.



Climate Issues: Climate Change in the Arctic

(version July 2025; approved in June 2025; includes subsequent changes)

AMAP's work reflects the long-term commitment of the Arctic Council to monitor and assess changes in the levels of pollution and climate change and their impacts on Arctic ecosystems and human populations.

This document presents a detailed stepwise plan for implementing AMAP work to address **issues related to climate change in the Arctic** throughout 2025 to 2027. This implementation plan builds on a related scoping document that was developed in support of the 2021-2023 Work Plan, scoping documents for separate activities, as well as previously approved versions of the plan that covered an earlier timeframe. This plan has been developed with guidance and support from the AMAP Climate Expert Group (CEG) Leads¹, AMAP Secretariat and climate tracking HoDs².

Together with other *AMAP implementation plans* that collectively cover the broad suite of issues within the AMAP mandate, this implementation plan is intended to help advance project-level work under the [AMAP Work Plan](#) in accordance with the [AMAP Strategic Framework 2019+](#), including its guiding principles and strategic goals, and to provide the AMAP Working Group and wider community with a common understanding of ongoing and planned AMAP activities.

The implementation activities described below will be carried out by the AMAP Climate Expert Group (CEG) with the support of the AMAP Secretariat, under the direction of AMAP HoDs³, and in a manner that is consistent with current Arctic Council guidelines for resumption of Working Group work.

These activities will support/contribute to the following AMAP Projects (as per AMAROK), in which they are referred to in Arctic Councils reports:

- Climate Issues: Cryosphere, meteorology, ecosystem impacts
- Understanding climate change impacts on Arctic ecosystems and associated climate feedbacks
- Human Health and combined effects;
- AMAP Trends and Effects Programme;
- Participation in international workshops, conferences;
- Efforts to engage PPs in AMAP's work.

The key AMAP products and deliverables planned for 2025-2027 in relation to AMAP work to address **climate change in the Arctic** are:

- Technical reports;
- Scoping report;
- Summary for Policy-makers;
- Outreach products, including webinars and outreach at international scientific conferences.

This implementation plan is intended to be updated and presented to the AMAP WG on a biannual basis (approximately January and July), or as needed, as determined by AMAP HoDs.

¹ The Climate Expert Group co-leads have since changed and are currently: Julie Brigham-Grette (US), Rasmus Benestad (NOR) and Johanna Mård (SWE)

² [Link to Tracking HoDs List](#) on Sharepoint

³ AMAP HoDs includes AMAP Heads of delegation of the 8 Arctic Nations and 6 Permanent Participants.

A. Background

The impacts of increasing concentrations of greenhouse gases in the atmosphere are being amplified in the Arctic. The ice, the snow, the frozen ground, the main components of the Arctic environment are all extremely sensitive to heat and are rapidly responding to these changing conditions and in turn affecting the Arctic's physical, chemical, and biological systems. The region is transitioning to a new state. What happens in the Arctic does not stay in the Arctic. This region plays a crucial role as a regulator of global temperatures. It contributes to sea level rise and impacts ecosystems and the livelihoods of those who live and work in the Arctic and beyond.

The 1991 AMAP mandate to monitor the levels of, and assess the effects of, anthropogenic contaminants in the Arctic was expanded in 1996 to include assessment of the effects of climate change in the Arctic including its ecosystems. AMAP's work on climate change is currently addressed mainly by the CEG, building on the groundbreaking 2004/2005 *Arctic Climate Impact Assessment (ACIA)*, the two *Snow, Water, Ice and Permafrost in the Arctic (SWIPA)* assessments (2011 and 2017), the three 2017 regional assessments of *Adaptation Actions for a Changing Arctic* and the 2018 assessment of *Arctic Ocean Acidification (AOA)*. In addition, AMAP's cross-cutting work on climate and air pollution has addressed Short-lived Climate Forcers (SLCFs) through its SLCF expert group.

As well as informing the Arctic Council and its member states and Permanent Participants, AMAP assessment and data products concerning climate change contribute to assessment activities under the Intergovernmental Panel on Climate Change (IPCC), the UN Framework Convention on Climate Change (UNFCCC) and current UN initiatives to link Conventions dealing with climate change, biodiversity and pollution. They are also a basis for outreach activities in relation to climate change.

B. AMAP's CEG implementation plan – Overview of Implementation Activities

AMAP's Climate implementation plan for 2025-2027 includes five primary activities:

- 2026 Arctic Climate Update Report: Key Trends and Impacts
- Societal Implications of Climate Change in the Arctic Assessment
- Ecosystem impacts of climate change and associated feedbacks to climate (AMAP/CAFF project)
- Scoping of AMAP's work on Risks and Implications of Climate Interventions
- Cooperation with other organizations and outreach activities

1. Observation and assessment: preparing timely Arctic climate update reports on key climate issues, trends and impacts

Climate Expert Group co-leads: Johanna Mård (SWE), Rasmus Benestad (NOR), and Julie Brigham-Grette (US)

Rationale and description:

A key activity of AMAP is to ensure continued monitoring of key climate indicators/essential climate variables at Arctic sites, to extend the coverage of these observations, and to include additional parameters as may be needed. Model evaluation and downscaling of models to regional level are key components of this work. Arctic Ocean Acidification (AOA) is also incorporated in this work to provide a broader scope on the impacts of carbon emissions.

However, major climate change assessments, including the ACIA (2005) and two SWIPA (2011 and 2017) assessments, as well as the IPCC assessments, are very resource-demanding and time-consuming to prepare, review and publish, resulting in an interval of about six years between each major assessment. While the extent and comprehensiveness of such assessments are extremely important, the current rate of climate change and the increasing extent of its impacts led HoDs in 2021 to request the CEG to produce shorter, more frequent (preferably biennial) reports on topics that the CEG identifies as in need of a critical update or for highlighting their importance.

Accordingly, the first substantive climate update report, the *AMAP Arctic Climate Update 2021: Key trends and Impacts*, was published in early 2022. This was followed by the second *AMAP Arctic Climate Update 2024: Key trends and Impacts* in spring 2025. This second report contains data and observations to the end of 2023 and partially to the end of 2024. The report provides updates on 1) key climate indicators; 2) the cryosphere (updating the 2021 report and the 2017 SWIPA assessment); 3) terrestrial hydrology, partially updating the 2015 Arctic Freshwater Synthesis; 4) Arctic Ocean acidification, updating the 2018 AOA assessment; 5) Arctic extremes, Arctic/mid-latitude weather connections and wildfires, updates from 2021.

In 2025-26 a third *AMAP Arctic Climate Update 2026: Key Trends and impacts* will be prepared. It includes chapters on: 1) Key climate indicators, 2) Greenland ice sheet and Arctic Land ice (update of SWIPA 2017), 3) Snow changes in the Arctic, 4) changing marine climate, 5) terrestrial carbon cycle (update of SWIPA 2017), 6) persistent Arctic weather patterns (new topic), 7)

attribution of Arctic Amplification (new topic), 8) Arctic Thresholds and tipping points (update of the climate update 2021)⁴.

In addition, during 2025, a small team of experts on ocean acidification will be formed to assess the results of statistical downscaling of CMIP6-models for the Arctic oceans for variables relevant for ocean acidification, including comparisons with observations for the Barents Sea Large Marine Ecosystem (LME), the Northern Bering/Chukchi sea LME and Laptev LME. It is proposed that a technical report will be prepared on the results of this analysis.

Progress to-date:

The summary for policymakers of the Climate Update Report 2024 has been delivered to the Arctic Council for their preparation of the 14th meeting of the Arctic Council in May 2025.

A compilation of draft outlines of proposed chapters for a 2026 climate update report, prepared on the basis of discussions at the Climate Expert Group meeting in October 2024 and subsequent discussions at an online meeting on 21 November, was on the agenda of the 15 January 2024 HoDs meeting. However, owing to a lack of time, initial discussion of the scope and proposed contents of the report was deferred to a meeting of climate Tracking HoDs on 22 January. At that meeting, there was generally a positive view of the topics proposed, but there was concern that experts are not overloaded with work, given that AMAP is also coordinating two major climate assessments scheduled for completion in 2027. Also, given the time and effort to produce biennial climate update reports, HoDs wished to know the value of these reports and whether they provide timely information to policy makers on evolving topics of importance. Ultimately, based on revised outlines for several of the chapters and the justifications for the various topics, HoDs approved the topics for this report.

Regarding potential overload and overlap with other assessments, based on a meeting of the AMAP/CAFF Steering Group for the assessment of Climate Change Impacts on Arctic Ecosystems and Associated Feedbacks to Climate on 10 February 2025, the current status of that project is that work on the scientific articles in the special journal issue is nearly complete. Work on Work Package 1 on co-production is currently being planned. The AMAP/CAFF project Steering Group agreed that production of an overall report for the project is important and proposals for the content and scope of such a report will be developed over the next several months. This implies that there will be no overlap in the timing of the work on that project and the 2026 update report. There is also virtually no overlap in the topics under consideration in the two activities.

The process of nominating chapter contributing authors to the Climate Update Report 2026 ended April 25 and the drafting as of May 2025 is well underway.

⁴ Final outline to be confirmed in spring 2025

2. Documenting and assessing the societal implications of climate change in the Arctic (SICCA)

Project co-leads: Vera Hausner (NOR), Marianne Falardeau (CAN), Lauren Divine (AIA) and Nathan Kettle (US)

Rationale and description:

After the completion of the SWIPA assessment work, the CEG concluded that, while it is still important to monitor and assess the physical and geochemical changes associated with climate change, it is also essential to document and assess the societal implications of these many changes. Initial work in this area was included in parts of the 2017/2018 AACA and AOA assessments.

The primary objective of this activity is to provide a broad documentation of the impacts of climate change on Arctic societies and people, with strong participation of PPs and other Indigenous Peoples representatives. In addition to documenting the current status of such impacts, the initial aim has been to project, to the extent possible, the further development of these impacts over time to enable a basis for adaptation actions.

Progress to-date:

AMAP HoDs approved in 2021 the outline of this assessment activity, comprising a structure of the chapters and some policy-relevant questions. A nomination process in 2021/22 for chapter co-leads was also held and experts were recruited for some of the chapters. The AMAP Secretariat, in cooperation with UiT and Prof. Vera Hausner, has secured funding to employ an assistant to provide administrative support and assist in communications and collection of information.

However, progress in implementation has been delayed due to the strategic pause of the Arctic Council and the challenges that follow when working under those conditions with such an extensive and complex assessment activity as SICCA.

Several planning meetings have been held since summer 2024 between the assessment co-leads, PPs and the AMAP Secretariat to resume the work. For the current assessment, a co-assessment approach with PP representatives in central roles has been agreed among the assessment co-leads and PP Tracking HoDs. This will now mainly be based on a compilation and assessment of literature on relevant studies (including academic and grey literature) that also include the results of co-produced studies. This approach will facilitate the appropriate inclusion of Indigenous Knowledge that has been published in the literature.

This has resulted in a need to revisit the scoping document, chapter outlines and policy-relevant science questions that were drafted over three years ago. A new process of identifying and inviting chapter co-leads to join the assessment ended in November 2024 and nominations for contributing authors ended in April 2025.

An assessment team has been established with the four assessment co-leads and chapter co-leads (2-3 per chapter) and the drafting has started. The PPs have also proposed that a representative of the PPs serve as a review editor of the SICCA assessment chapter texts, similar to what is being done in the IPCC Assessment process. Kata Kuhnert, ICC, has agreed to serve in this role and will work with chapter co-leads to ensure the inclusion of Indigenous Knowledge in and across chapters. This is the first time such a role has been taken on in an AMAP Assessment.

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The assessment is planned to be published in 2027 in order to meet the deadline for contributions to the IPCC AR7. A summary for policymakers will be prepared and delivered to the ministerial meeting in May 2027.

3. Ecosystem impacts of climate change and associated feedbacks to climate (AMAP/CAFF project)

Project co-leads: WP1: Sophie Crump (ICC) and Marét Hætta (Saami Council), WP2: Torben Christensen (KoD) and Per Fauchald (NOR)

Rationale and description:

Climate change is currently altering Arctic ecosystems and biodiversity. These ecosystem changes feed back to the climate system, with a potential to dampen or accelerate local to regional changes in climate and emissions of greenhouse gasses and SLCFs and affect global-scale climate systems. The resulting impacts on Arctic ecosystem services, livelihoods and well-being are accelerating and will have far-reaching consequences for local communities, and particularly Arctic Indigenous Peoples. The over-arching objective of the joint activity between the AMAP and CAFF Working Groups of the Arctic Council is to assess how climate change affects Arctic ecosystems and the associated climate feedbacks, to inform strategies for adaptation and increase resilience. A scoping document⁵ for this assessment was approved at a joint meeting of AMAP HoDs and the CAFF Board, and an implementation plan⁶ was subsequently approved separately by AMAP HoDs/PPs and the CAFF Board.

Progress to-date:

Work to date under Work Package 1 (co-production of knowledge) has initially been addressed at the Arctic Regional Climate Gathering under UNFCCC's Local Communities and Indigenous Peoples' Platform (LCIPP) in Kirkenes in October 2023. A breakout session at this meeting had a specific focus on AMAP/CAFF WP1 knowledge gathering. Saami Council is currently preparing a report from that gathering. Two co-leads were introduced to WP1 of the project in 2024 after a nomination round by the CAFF Board and AMAP HoDs: Marét Haetta (Saami Council) and Sophie Crump (ICC). A workshop about co-production of knowledge for this project was planned at an early stage of the implementation period but never carried out. Now that the co-leads for WP1 are in place, a series of workshops is under planning for late 2025 and 2026. The plan for implementing WP1 is still under development and regularly discussed at monthly meetings of the Steering Committee.

The majority of progress to date has been under Work Package 2 (scientific background), which is currently producing 11 scientific review papers for the journal *Frontiers in Environmental Science/Earth Science* for a special issue under the title "Climate Change Impacts on Arctic Ecosystems and Associated Climate Feedbacks"⁷ with an anticipated publication date mid-2025. AMAP and CAFF HoDs have nominated experts to contribute to these overview papers; the final list of papers and authors/co-authors will be available by the time of the submission.

To date, the other work packages (WP3 on "Ecosystem impacts on communities and livelihoods" and WP4 on "Ecosystem based adaptation strategies") have not been advanced.

⁵ Link to AMAP/CAFF scoping document on sharepoint: [AMAP-CAFF Joint-Work ScopingDocument -FINAL-24May2021.pdf](#)

⁶ Link to AMAP/CAFF implementation plan on sharepoint: [AMAP-CAFF Implementation Plan.pdf](#)

⁷ <https://www.frontiersin.org/research-topics/56230/climate-change-impacts-on-arctic-ecosystems-and-associated-climate-feedbacks/articles>

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The steering committee for the assessment has been re-established to guide the work and to propose any further changes to the implementation plan for this assessment, for consideration by AMAP HoDs and the CAFF Board. The Steering Committee has met four times since December 2024 and will draft an updated implementation plan with deliverables achievable for the 2025-27 Workplan period. The Steering committee agreed that production of an overall report for the project is important and proposals for the content and scope of such a report will be developed over the next several months. An updated implementation plan for this project will be sent to HoDs for review in fall 2025.

4. Scoping activity: Risks and implications of climate interventions

Rationale and description:

Scoping work on “Risks and Implications of Climate Interventions” has been adopted for inclusion in the AMAP 2025-27 workplan, including a timeline for delivering a product in 2026. A group of experts needs to be established and tasked with reviewing existing information and initiatives on climate interventions with high risk to potentially harm Arctic ecosystems and/or people. The scoping activity should result in proposals for ways in which AMAP can contribute to existing or needed processes for developing a governance framework or ethical guidelines for Arctic-relevant climate interventions.

The product of the scoping work to be delivered in 2026 is intended to inform AMAP HoDs regarding the need for further scientific work on this topic under AMAP, including possible messages that could be addressed to international processes on behalf of the AC/AMAP in this connection.

Progress to-date:

In fall 2024, a small group of experts nominated by the AMAP HoDs formed a pre-scoping group and drafted a report on “Implications and risks of climate interventions for Arctic ecosystems and peoples”. This document was presented to the HoDs at a meeting on the 15th of January 2025 and addressed considerations when undertaking the ‘Risks and Implications of Climate Interventions’ scoping work. Among other considerations, this pre-scoping exercise provided a small set of provisional policy-relevant questions, some indications on initial tasks essential to the main scoping activity and a tentative timeline.

5. Co-production of planned implementation activities

Rationale and description:

AMAP's Strategic Goals include enhancing engagement of Indigenous people in AMAP work, promoting both co-production of knowledge through early engagement of PPs in AMAP work planning as well as activities such as community-based monitoring and integration of Indigenous knowledge in AMAP assessments.

Progress to-date:

As noted above, co-production of knowledge is an important aspect of AMAP's climate work, in particular in relation to the assessment on societal implications of climate change and the AMAP/CAFF project. A proposed new project on 'how to incorporate Indigenous knowledge in AMAP assessments', approved by AMAP HoDs/PPs but yet to be implemented, is expected to inform further work on co-production in relation to AMAP work on climate change.

Utilizing Indigenous knowledge is core to AMAP's current two assessments (see 2 and 3, above); however, due to insufficient time and resources in the SICCA work, a co-assessment approach has been adopted instead.

6. Cooperation with other organizations and outreach activities

Rationale and description:

In addition to the Arctic Council, AMAP has a strong interest in communicating the results of its climate work to relevant international organizations, in particular the UNFCCC and IPCC. The AMAP Secretariat organizes side-events or sessions at several conferences throughout the year, for instance Arctic Frontiers, Arctic Science Summit Week and Arctic Circle Assembly. Outreach activity targeted towards observers is also planned.

IPCC

The AMAP Secretariat was granted observer status to the IPCC in January 2024 and will follow the work on the IPCC 7th Assessment Cycle closely. As an observer to the IPCC, AMAP can nominate experts to participate in scoping meetings and to take part in reports and assessments as authors and review editors

UNFCCC

AMAP representatives plan to be present at the UNFCCC COP30 in Belem, Brazil in November 2025. Outreach activities during the COP30 includes the outreach of the climate update report 2024 (full report or key highlights and recommendations) and possibly other outreach activities. Current UN initiatives to link Conventions dealing with climate change, biodiversity and pollution (the triple planetary crisis) are also relevant for AMAP work addressing climate change in the Arctic.

Progress to-date:

- AMAP had one expert representing AMAP Secretariat at the IPCC plenary meeting in July 2024 and expressed our interest in their work and our possible contributions during AR7.
- AMAP Secretariat nominated 12 experts to attend the IPCC scoping meeting in December 2024, and two experts were selected by IPCC and participated in WG1- and WG2- discussions to draft outlines for the IPCC Seventh Assessment Report.
- AMAP Secretariat has also nominated four experts with Arctic expertise as either lead authors or review editors for WG1 and WG2 to the IPCC Seventh Assessment cycle by their deadline April 17th.
- The SICCA leadership and AMAP Secretariat met with the IPCC WG2 co-chair in April 2025 to talk about AMAPs contributions to their work and in particular the results of the SICCA Assessment.

The Climate Update 2024 Report has been presented at Arctic Frontiers (January 2025, Tromsø) and Arctic Science Summit Week (March 2025, Boulder).

AMAP has submitted a proposal for a session to present key findings from the climate update report 2024 at Arctic Circle Assembly in Reykjavik 16-18 October 2025.

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The Climate Expert Groups leads will decide on topics for webinars about AMAPs work, targeted to AMAP WG, including the observers. We also plan to discuss with some observers about holding a webinar about observer members work on climate that could be relevant to AMAP and the activities in the current Workplan (2025-2027).

Annex: Table overview of implementation plan with tasks and timing

	Finalizing 2024 Arctic Climate Update report	Preparing 2026 Arctic Climate Update report	Implementing the assessment of societal implications of climate change in the Arctic (SICCA)	Implementing the AMAP/CAFF assessment of climate change impacts on Arctic ecosystems and associated feedbacks to climate	Scoping of Risks and Implications of Climate interventions	Cooperation with other organizations and outreach activities
Timing	Tasks	Tasks	Tasks	Tasks	Tasks	Tasks
Summary for 2025- 2027	<p>SUMMARY OF KEY STEPS, AT A GLANCE:</p> <p><u>Products completed:</u> Summary for policymakers and technical report published and available on the web site in May/June 2025</p> <p><u>Outreach</u> Sessions at several conferences during 2025 and 2026 (Arctic Circle, ASSW, Arctic Frontiers)</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE:</p> <p><u>Products completed:</u> Summary for policymakers and technical report published and available on the web site in 2026</p> <p><u>National Data Check</u> HoDs review 15 Sep- 10 Nov</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE:</p> <p><u>Products completed:</u> Summary for policymakers and technical report published and available on the web site in 2027</p> <p><u>National Data Check</u> HoDs review Dec 15- Feb 15)</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE:</p> <p><u>Review:</u> HoDs review of the updated implementation plan on the work moving forward with possible deliverables for 2027 (fall 2025)</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE:</p> <p><u>Call for nominations:</u> On scoping: to be circulated in May/June 2025</p> <p><u>Product(s) Completed:</u> technical scoping reports with recommendations for consideration by HoDs (2026)</p>	<p>SUMMARY OF KEY STEPS, AT A GLANCE:</p> <p><u>Outreach Events:</u> Sessions at UNFCCC COP30 (November 2025). Webinars (fall 2025)</p>

Annex: Table overview of implementation plan with tasks and timing

	Finalizing 2024 Arctic Climate Update report	Preparing 2026 Arctic Climate Update report	Implementing the assessment of societal implications of climate change in the Arctic (SICCA)	Implementing the AMAP/CAFF assessment of climate change impacts on Arctic ecosystems and associated feedbacks to climate	Scoping of Risks and Implications of Climate interventions	Cooperation with other organizations and outreach activities
Timing	Tasks	Tasks	Tasks	Tasks	Tasks	Tasks
Jan-Jun 2025	<p>Launch of key findings at Arctic Frontiers (Jan 29th)</p> <p>Session at Arctic Summit Science Week (March 24th)</p> <p>Pre-print online version available</p> <p>SPM Deliverable to the 14th Meeting of the Arctic Council Technical Report published</p>	<p>Final decision on structure and content</p> <p>Preparation of the chapters – drafting</p> <p>Monthly meetings with the chapter leads</p>	<p>Updated scoping document to reflect the co-assessment approach and response to HoDs comments in the HoDs meeting in December-24</p> <p>Monthly chapter meetings</p> <p>Nominations of contributing authors (Due 25 April)</p> <p>Finalizing outlines for HoDs review May 30 – June 20</p> <p>Preparing draft chapters</p>	<p>Monthly meetings with the Steering committee</p> <p>Special Issue in Journal Published 11 papers (June)</p> <p>WP1 planning</p>	<p>Nomination of contributors by HoDs (May/June)</p>	<p>Arctic Frontiers</p> <ul style="list-style-type: none"> - Climate Update Report session <p>Meeting with IPCC WG2 co-chair</p> <p>Arctic Science Week Assembly</p> <ul style="list-style-type: none"> - Climate Update report session

Annex: Table overview of implementation plan with tasks and timing

	Finalizing 2024 Arctic Climate Update report	Preparing 2026 Arctic Climate Update report	Implementing the assessment of societal implications of climate change in the Arctic (SICCA)	Implementing the AMAP/CAFF assessment of climate change impacts on Arctic ecosystems and associated feedbacks to climate	Scoping of Risks and Implications of Climate interventions	Cooperation with other organizations and outreach activities
Timing	Tasks	Tasks	Tasks	Tasks	Tasks	Tasks
July-Dec 2025	Draft report on ocean Acidification for review	National Data check (15 Sep – 10 Nov)	First draft (august) PP review by review editor (October) National Data Check (Dec 15- Feb 15)	Updated Implementation Plan for HoDs review (September) WP2 Workshop in Reykjavik (Arctic Circle, tbc) WP1 Workshop in Reykjavik (Arctic Circle, tbc)	Meetings with scoping Group Draft scoping document	Arctic Circle 2025 - Climate Update report session - AMAP/CAFF workshops (tbc) UNFCCC COP30 in Belem Webinar about results from Climate Update 2024 Report Webinars for observers about climate work (tbc)
2026						
Jan – Jun		Peer Review Editing	National Data Check contd. Peer Review	Preparation of a synthesis Report	Finalize scoping report and send to HoDs for their review	Arctic Frontiers

Annex: Table overview of implementation plan with tasks and timing

	Finalizing 2024 Arctic Climate Update report	Preparing 2026 Arctic Climate Update report	Implementing the assessment of societal implications of climate change in the Arctic (SICCA)	Implementing the AMAP/CAFF assessment of climate change impacts on Arctic ecosystems and associated feedbacks to climate	Scoping of Risks and Implications of Climate interventions	Cooperation with other organizations and outreach activities
Timing	Tasks	Tasks	Tasks	Tasks	Tasks	Tasks
		SPM drafting	Editing	for the whole project (tbc ⁸)		
July – December		Publication (late 2026)	SPM drafting	SPM drafting of the synthesis report (tbc)		
2027						
Jan – Jun		Outreach (see column to the far right)	Approval of SPM Launch of SPM and technical Report	Approval of SPM (tbc) Launch of SPM and synthesis report (tbc)		Arctic Frontiers (January) - Climate update 2026 - Climate Interventions
July – December						

⁸ Pending approval of the updated implementation plan fall 2025