

OVERVIEW OF AMAP INITIATIVES FOR **MONITORING AND ASSESSMENT OF PLASTIC POLLUTION IN THE ARCTIC**

ARCTIC MONITORING & ASSESSMENT PROGRAMME



ARCTIC COUNCIL

AMAP

The Arctic Monitoring and Assessment Programme (AMAP), a working group of the Arctic Council, is tasked with monitoring and assessing the status of the Arctic region with respect to pollution and climate change issues including the monitoring of litter and microplastics.

There is currently **limited information** about abundance, composition, and distribution of plastic pollution in the Arctic. In an effort to reduce this knowledge gap, AMAP has developed a **Monitoring Plan** for a coordinated pan-Arctic environmental monitoring program and an accompanying comprehensive set of technical **Monitoring Guidelines**. Together, these will provide valuable information and guidance for national and regional institutions to consider when implementing their respective plastics monitoring initiatives.

Monitoring Plan

Litter and microplastics must be monitored in the Arctic environment to understand their sources, transportation patterns, spatial and temporal trends, and possible impacts on the Arctic. More data and improved information will also be beneficial for developing and validating Arctic-specific modeling approaches to understand areas of concentration where actions could be prioritized.

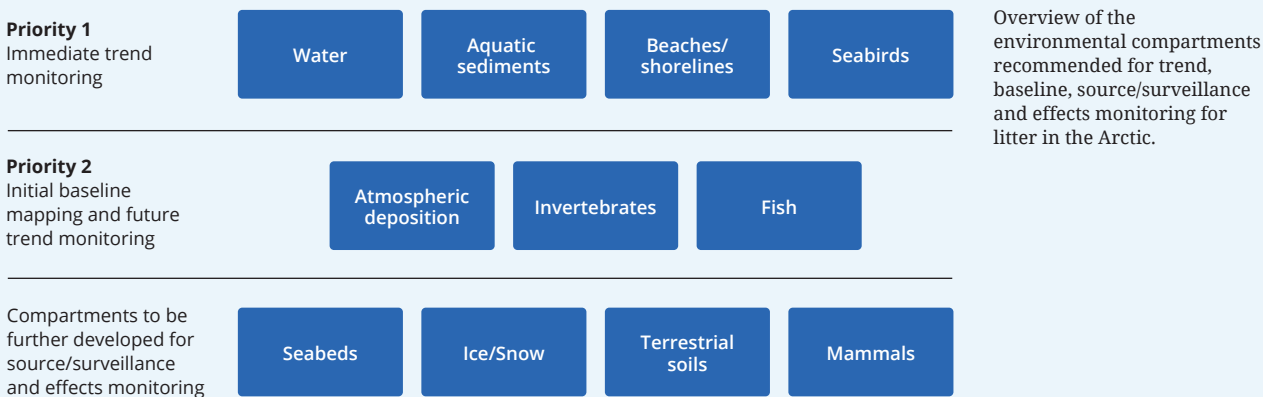
The *AMAP Litter and Microplastics Monitoring Plan* builds on existing regional and global monitoring programs and their protocols, with a broader scope that includes freshwater, terrestrial, and atmospheric environments in addition to the marine environment.

Specifically, the Monitoring Plan will:

- promote a harmonized monitoring approach to enable robust and temporal comparisons;
- initiate trend monitoring;
- provide guidance to stakeholders on monitoring and research in the context of a pan-Arctic plan;
- identify key datasets for use with the Arctic Council’s *Marine Litter Regional Action Plan*;
- act as a catalyst for future litter and microplastics work; and
- assist the Arctic Council in its continued work on plastic pollution in the Arctic.

Monitoring Guidelines:

The *AMAP Litter and Microplastics Monitoring Guidelines* provide technical guidance for sampling and analysis in Priority 1, 2, and the additional environmental compartments (see figure below). These include the marine, freshwater, terrestrial, and atmospheric environments, in a holistic approach to monitoring litter and microplastics in the Arctic. The Guidelines also promote a harmonized approach and standard of reporting for litter in the Arctic. This technical document covers state-of-the-art methods, with their possibilities and limitations, in the context of an Arctic monitoring program.





Sediment sampling, Iqaluit, Canada. Photo: Jenn Provencher

Recommended Actions and Considerations:

At this initial stage, the AMAP recommends baseline mapping, trend monitoring, and source and surveillance monitoring of litter and microplastics. Additional types of monitoring, such as monitoring for the effects of these pollutants, are identified for consideration at a later stage.

The recommendations prioritize monitoring the primary indicators for **beaches/shorelines**, **sediments** (freshwater and marine), **water** (freshwater and marine), and **seabirds (Priority 1)**; Secondary recommendations include the primary indicators for **air**, **fish**, and **invertebrates (Priority 2)**.

Because the abundance of litter and microplastics in all environmental compartments is so variable, high numbers of replicates and several years of observations may be required to detect temporal trends with sufficient statistical power.

The AMAP Litter and Microplastics Expert Group (LMEG) was established in 2019 to:

- review the status and knowledge of plastic pollution in the Arctic
- provide recommendations for future pan-Arctic monitoring, and
- promote a harmonized monitoring and standard reporting approach.

In greater detail, AMAP recommends;

- annual monitoring of Priority 1 compartments, i.e., baseline mapping (to establish benchmark levels for specific areas at a given time), trend monitoring (to detect changes across time and space), and/or source and surveillance monitoring (to determine local or distant sources);
- immediate implementation of primary indicators where feasible and relevant across the pan-Arctic region, at one or more sites, for all Priority 1 compartments (e.g., examination of plastics in fulmar stomachs, litter surveys on beaches/shorelines, etc.);
- consideration of local priorities for monitoring, i.e., some of the Priority 2 compartments (e.g., accumulation of microplastics in fish in Indigenous communities); and
- selection of the most relevant or logistically feasible compartments for implementation by the Arctic States, within the selected Large Marine Ecosystems (LMEs) in their jurisdiction.
- focus on understudied systems, e.g., large river systems and their watersheds (monitoring to track the transport and fate of litter and microplastics by sampling along the flow of the river, particularly above and below potential sources of litter and microplastics).

An effective Monitoring Plan benefits from pan-Arctic coordination and implementation in a collaborative and strategic manner. Its implementation could combine a variety of approaches, including nationally defined and community-based programs and involve existing infrastructure and citizen-science campaigns. Indigenous and local concerns and national capacities must be considered and planned for. Finally, Arctic litter and microplastics data should be accessible to aid with global, regional, and national efforts to reduce pollution and minimize harm to the environment.

AMAP, established in 1991 under the eight-country Arctic Environmental Protection Strategy, monitors and assesses the status of the Arctic region with respect to pollution and climate change. AMAP produces science-based policy-relevant assessments and public outreach products to inform policy and decision-making processes. Since 1996, AMAP has served as one of the Arctic Council's six working groups.

This document was prepared by the Arctic Monitoring and Assessment Programme (AMAP) and does not necessarily represent the views of the Arctic Council, its members or its observers.

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