

# Introduction



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## Environmental protection of the Arctic – a short history

Concerns about contaminants in the Arctic date back at least 30 years, with an increasing and broadening awareness since the early 1970s. In the spring of 1989, Finland proposed a conference on the protection of the Arctic environment. The idea was favorably received by the governments of the other circumpolar countries: Canada, Denmark/Greenland, Iceland, Norway, Sweden, the Soviet Union, and the United States. The first preparatory meetings were held in Rovaniemi, Finland, in September 1989, which started the 'Rovaniemi process'.

One idea agreed upon early was to produce a series of reports concerning the potential pollutants in different parts of the Arctic environment and its ecosystems. These initial 'State of the Arctic Environment' reports were presented at the First Arctic Ministerial Conference in Rovaniemi, Finland in June 1991. The ministerial conference was a breakthrough in the development of international cooperation for the protection of the Arctic, and led to the adoption of the Arctic Environmental Protection Strategy (AEPS).

The objectives of the AEPS, as adopted in the Rovaniemi Declaration, are as follows:

- to protect the Arctic ecosystems, including humans;
- to provide for the protection, enhancement and restoration of environmental quality and sustainable utilization of natural resources, including their use by local populations and indigenous peoples in the Arctic;
- to recognize and, to the extent possible, seek to accommodate the traditional and cultural needs, values and practices of indigenous peoples as determined by themselves, related to the protection of the Arctic environment;
- to review regularly the state of the Arctic environment;
- to identify, reduce and, as a final goal, eliminate pollution.

Moreover, in adopting the AEPS, the governments of the eight circumpolar countries formally recognized the importance of including representatives of indigenous peoples of the north as active participants in the process.

To implement the AEPS, five working groups were instituted:

*Arctic Monitoring and Assessment Programme (AMAP)*, with responsibilities to monitor the levels and assess the effects of anthropogenic pollutants in all compartments of the Arctic environment.

*Conservation of Arctic Flora and Fauna (CAFF)*, with responsibilities to facilitate the exchange of information and coordination of research on species and habitats of Arctic flora and fauna.

*Emergency Prevention, Preparedness and Response (EPPR)*, with responsibilities to provide a framework for future cooperation in responding to the threat of Arctic environmental emergencies.

*Protection of the Arctic Marine Environment (PAME)*, with responsibilities to take preventative and other measures directly or through competent international organizations regarding marine pollution in the Arctic, irrespective of origin.

*Sustainable Development and Utilization (SDU)*, with responsibilities to propose steps governments should take to meet their commitment to sustainable development of the Arctic, including the sustainable use of renewable resources by indigenous peoples.

Since the First Arctic Ministerial Conference in 1991, two further conferences have been held, in Nuuk, Greenland in 1993, and in Inuvik, Canada in 1996. A fourth AEPS Ministerial Conference, in Norway in 1997, will consider this report and its recommendations. Following this conference, the AEPS and its programs will be incorporated under the newly established Arctic Council.

## AMAP

AMAP's first objective has been to provide information for a comprehensive assessment report on threats from pollution to Arctic ecosystems. The assessment was to identify possible causes for changing conditions, detect emerging problems, and recommend actions required to reduce risks to Arctic ecosystems.

From its inception, AMAP was conceived as a process integrating both monitoring and assessment activities. During its first period (1991-1996), AMAP has designed and implemented a coordinated program to monitor levels of pollutants in all compartments of the Arctic environment – the atmospheric, terrestrial, freshwater, and marine environments – and in human populations with respect to human health.

AMAP has also instituted an assessment process to produce assessment reports based on data already published in scientific literature, data obtained from AMAP's monitoring program, and traditional knowledge.

The initial work of AMAP focuses on three priority pollutants: persistent organic pollutants, heavy metals, and radioactivity. AMAP was also requested to monitor hydrocarbons to achieve better documentation of oil pollu-

tion in the Arctic. At the Nuuk ministerial conference in 1993, acidification was given priority status on a subregional basis for Fennoscandia. Global climate change and stratospheric ozone layer depletion are addressed by other international programs, and at Nuuk AMAP was asked to assess whether the coverage of Arctic areas was sufficient within these programs.

### Structure

The work of AMAP is implemented by the AMAP Working Group, which includes the following members:

- Representatives from the eight Arctic countries: Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, Sweden, and the United States;
- Representatives from indigenous peoples organizations: Saami Council, Inuit Circumpolar Conference (ICC), and the Association of Indigenous Peoples of the North, Siberia, and the Far East of the Russian Federation (AIPON).

To facilitate and harmonize AMAP's work with other actors in the Arctic, the following countries and organizations participate as observers in the Working Group:

- Observing countries: Germany, Netherlands, Poland, United Kingdom;
- Observing and Cooperating International Organizations: Advisory Committee on Protection of the Sea (ACOPS), European Environment Agency (EEA), International Arctic Science Committee (IASC), International Atomic Energy Agency (IAEA), International Council for the Exploration of the Sea (ICES), International Union for Circumpolar Health (IUCH), Nordic Council of Parliamentarians (NCP), Northern Forum, OECD Nuclear Energy Agency (OECD/NEA), Oslo and Paris Commissions (OSPARCOM), United Nations Economic Commission for Europe (UN ECE), United Nations Environment Programme (UNEP), World Meteorological Organization (WMO), World Wide Fund for Nature (WWF);
- AEPS Organizations: Conservation of Arctic Flora and Fauna (CAFF), Protection of the Arctic Marine Environment (PAME), Emergency Prevention, Preparedness and Response (EPPR), Indigenous Peoples Secretariat (IPS), Sustainable Development and Utilization (SDU).

AMAP also established an Assessment Steering Group to coordinate all work associated with the assessment of contaminants in the Arctic environment. The members are scientists active in different fields of research, representatives of indigenous peoples organizations, and the AMAP Board (chair, vice-chair, and executive secretary).

AMAP is supported by a permanent Secretariat located in Oslo, Norway.

### International agreements relevant to the Arctic

Pollution issues are covered by several international agreements that are important in political efforts to reduce damage to Arctic ecosystems. Those that have particular relevance to this assessment are:

*Convention on Long-Range Transboundary Air Pollution (LRTAP):* The purpose of the UN Economic Commission for Europe's LRTAP Convention is to prevent, reduce, and control transboundary air pollution from both existing and new sources. This regional, binding agreement and the five related protocols represent the most appropriate instrument for addressing relevant components of the Arctic pollution problem. Current negotiations in LRTAP include efforts to conclude a new protocol on photochemical pollution, acidification, and eutrophication, and to prepare new protocols on heavy metals and persistent organic pollutants.

*Convention for the Protection of the Marine Environment of the North East Atlantic, 1992 (OSPAR):* OSPAR was developed under the Oslo and Paris Commissions to update two existing Conventions (the 1974 Paris Convention for the Prevention of Marine Pollution from Land-based Sources, and the 1972 Oslo Convention for the Prevention of Marine Pollution from Ships and Aircraft). The 1992 OSPAR Convention is currently one of the most applicable international agreements for addressing Arctic marine pollution from various sources.

*The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78):* This convention is a combination of two treaties adopted in 1973 and 1978. It covers all the technical aspects of pollution from ships, except the disposal of waste into the sea by dumping, and applies to ships of all types. It has five annexes covering oil, chemicals, sewage, garbage, and harmful substances carried in packages, portable tanks, freight containers, etc.

*Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter - London Dumping Convention:* The London Dumping Convention is the primary international agreement regulating ocean dumping of wastes. It has direct significance for several aspects of environmental protection of the Arctic, particularly in relation to radioactive waste disposal issues. All eight Arctic countries are Contracting Parties and have signed a recent comprehensive revision and restructuring of this Convention.

*Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer:* The Vienna Convention of 1985 identified the threat to ozone in the atmosphere and resulted in the adoption of the 1987 Montreal Protocol, which limits the production of substances responsible for stratospheric ozone depletion. Compliance with the protocol including its amendments is the primary mechanism for protecting stratospheric ozone.

*Climate Convention:* Adopted at the Rio Conference in 1992, the United Nations Framework Convention on Climate Change provides an international framework to discuss greenhouse gases, especially carbon dioxide. A ministerial declaration at a meeting of parties to the convention in June 1996 includes instructions to negotiate binding agreements to reduce emissions.

*UNEP Global Programme of Action:* The 19th session of the UNEP Governing Council has decided to establish a negotiating committee before July 1, 1998 to prepare a global, legally-binding agreement on at least 12 persistent organic pollutants, and to finish its work before 2000. This fulfills a ministerial agreement within UNEP's Global Programme of Action for the Protection of the Marine Environment from Land-based Activities.

## AMAP's assessment process

This assessment of contaminants in the Arctic regions has not been designed as an assessment of environmental impact, nor is it intended to be a formal risk assessment for human and environmental health for the purposes of developing risk management policies. Rather, the aim of the assessment is to provide a baseline for understanding the status of contaminants in the Arctic: it provides the fundamental information needed to structure and conduct formal risk assessments related to human health and ecosystem damage in future work.

## The assessment reports

The assessment is presented in two reports. The scientific documentation, including data and references, is available in *The AMAP Assessment Report: Arctic Pollution Issues*, which has been prepared by drafting groups with key scientific expertise under the responsibility of one or more lead countries. The work has been supported by a large number of additional experts. Representatives of indigenous peoples organizations have actively participated in the assessment, especially in those chapters that concern human populations and human health. The authors of the respective chapters are responsible for the content and conclusions in their chapters of *The AMAP Assessment Report: Arctic Pollution Issues*.

The second report, *Arctic Pollution Issues: A State of the Arctic Environment Report*, is a summary and synthesis of *The AMAP Assessment Report: Arctic Pollution Issues*, written by a science journalist for a general audience interested in the implications of contaminants in the Arctic environment. While the Assessment Steering Group, with the assistance of many experts, has provided information and feedback for this second report, the responsibility for its final content, including the Executive Summary, rests with the AMAP Working Group.

The structures of the two reports are similar, and readers of this book interested in more details about particular topics are referred to the corresponding chapters of *The AMAP Assessment Report: Arctic Pollution Issues*.

## Reader's guide

The AMAP Working Group has summarized the information from AMAP's assessment of pollution in the Arctic in the *Executive Summary*, which appears at the beginning of this report. The Executive Summary also highlights the actions that need to be taken to follow up on the assessment, including scientific research priorities for continued assessment work and

recommendations for political actions to reduce or limit further contamination of the Arctic.

More information on each of the subjects is found in the different chapters in the body of this report.

The *Introduction* (this chapter), describes the political background for the reports and the assessment process, and chapters 2 to 5 form a background for the discussion of specific contaminants.

*The Arctic* describes the geography of the area covered in AMAP's assessment and some features of the Arctic environment.

*Physical pathways of contaminants transport* focuses on the movement of contaminants with air masses, ocean currents, and waterways, specifically addressing the Arctic as a recipient of contaminants from other areas.

*Polar ecology* discusses adaptations of Arctic plants and animals to the polar environment that make them especially susceptible to the effects of contaminants. It also describes biological pathways and food webs in terrestrial, freshwater, and marine ecosystems.

*Peoples of the North* gives an introduction to Arctic lifestyles with a focus on indigenous populations. Special emphasis is placed on the role of traditional foods in a cultural context.

The following four chapters, *Persistent organic pollutants*, *Heavy metals*, *Radioactivity*, and *Acidification and Arctic haze*, contain syntheses of the circumpolar assessment of priority pollutants, describing their toxicology, levels, trends, and effects on Arctic plants and animals.

*Petroleum hydrocarbons* describes the actual and potential effects of oil exploitation in the Arctic. This chapter also includes a discussion of levels and trends of polycyclic aromatic hydrocarbons (PAHs).

Two global environmental issues and their potential effects on the Arctic environment are covered in the chapter *Climate change, ozone depletion, and ultraviolet radiation*.

*Pollution and human health* assesses the impact that the contaminants described in the other chapters have on human well-being and provides a context of communication and culture that is essential in the continued discussion of Arctic pollution issues. It also presents the first results of AMAP's human health monitoring program.

The report also contains a *circumpolar map* (inside front cover).