

ARCTIC MONITORING AND ASSESSMENT PROGRAMME

AMAP Strategy: 2004+
AMAP Report 2004:5

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Preface

The AMAP Strategic Plan 2004+, as described in this document, constitutes the framework for AMAP activities during the period 2004-2012. It will be updated as and when necessary to reflect the decisions of the Arctic Council Ministers that determine the AMAP mandate.

Details of the implementation plan can be found in the related AMAP Workplan, which is updated on an annual basis and can be found on the AMAP website: www.amap.no.

This document updates the 'AMAP Strategic Plan 1998-2003' (published as AMAP Report 99:6). Notable changes introduced in the Strategic Plan 2004+ include:

- The definition of three types of assessment product, and description of the process for producing these three different types of product.
- Changes to sections concerning climate change and UV that have been introduced to reflect Ministers decisions relating to the Arctic Climate Impact Assessment (ACIA).

The AMAP Strategic Plan 2004+ was approved by the Arctic Council Ministers at the Fourth Arctic Council Ministerial Meeting in Reykjavik, Iceland, November 2004.

THE AMAP STRATEGY: 2004+

1. INTRODUCTION

1.1 The Arctic Monitoring and Assessment Programme (AMAP)

The Arctic Monitoring and Assessment Programme (AMAP) is an intergovernmental programme under the Arctic Council. AMAP was established in 1991 to implement components of the Arctic Environmental Protection Strategy (AEPS). In June 1997, the AEPS and its groups were subsumed under the responsibilities of the Arctic Council.

The current AMAP mandate is a result of decisions initially taken during AEPS, and since 1998, Arctic Council Ministerial meetings. Details are available in the Rovaniemi (1991), Nuuk (1993), Inuvik (1996), Alta (1997), Iqaluit (1998), Barrow (2000), Inari (2002), and Reykjavik (2004) Ministerial Declarations.

The AMAP Strategy 2004+ is developed in accordance with this mandate.

1.2 Scope of the Strategy

The aim of the Strategy is to establish an overall framework for implementing the activities of AMAP. Further details, and the most up-to-date version of the AMAP Workplan to implement the strategy can be found on the AMAP website at www.amap.no.

2. AMAP MANDATE, OBJECTIVES AND PRIORITIES FOR THE PERIOD 2004+

2.1 Mandate and objectives

Since 1991, the primary objectives of AMAP have been:

- *to measure the levels, and assess the effects of anthropogenic pollutants in all compartments of the Arctic environment, including humans;*
- *to document trends in pollution;*
- *to document sources and pathways of pollutants;*
- *to examine the impact of pollution on Arctic flora and fauna, especially those used as food by indigenous people and the general population;*
- *to report on the state of the Arctic environment to Ministers and relevant fora; and*
- *to give advice to Ministers on priority actions needed to improve the environmental conditions in the Arctic.*

In addition to “*activities for monitoring, data collection, exchange of data on impacts and assessment of the effects of contaminants and their pathways*” the AMAP mandate has been further elaborated since 1991 to include “*effects of increased UV-B radiation due to stratospheric ozone depletion, and climate change on Arctic ecosystems.*” with “*special attention on human health impacts and the effects of multiple stressors.*”

Background information on AMAP activities between 1991 and 2003 is given in Annex 1.

At the Reykjavik Ministerial meeting in 2004, Ministers “welcomed with appreciation the Arctic Climate Impact Assessment (ACIA) and the scientific work completed in evaluating and synthesizing knowledge on climate variability and change and increased ultraviolet radiation in the Arctic” that was produced by AMAP together with CAFF and IASC.

Recognizing that “further research, observations, monitoring and modelling is needed to refine and extend the ACIA findings” the Ministers “endorsed the ACIA policy recommendations for ... research and monitoring” and “directed relevant technical working groups of the Arctic Council to review the scientific chapters of the ACIA in the context of their ongoing and future work programmes.

2.2 Priorities

AMAP activities focus on the following priorities:

⇒ ***Contaminant levels, trends and effects in human populations and in the environment***

- to monitor temporal trends in the levels of prioritised contaminants (persistent organic pollutants, heavy metals, radioactivity, acidification, hydrocarbons);
- to determine more fully the geographic distribution and magnitude of contaminant levels on a circumpolar basis;
- to clarify the adverse effects of priority contaminants on human populations, especially on child development;
- to monitor and identify chemical and biological effects on Arctic flora and fauna;
- to identify new contaminants that may pose a cause for concern in the Arctic.

⇒ ***Impacts of climate and UV radiation***

- to monitor and assess impacts of climate change and UV radiation in the Arctic, including their effects on Arctic ecosystems and human health, taking into account the scientific recommendations of the ACIA assessment.

⇒ ***Source-receptor relationships***

- to quantify and assess the significance of the different contaminant sources and contaminant pathways to and within the Arctic.

⇒ ***Human health***

- to improve the knowledge needed to protect and promote the health of Northern peoples with respect to their exposure to environmental contaminants.

⇒ ***Communication of information***

- to communicate results in an appropriate and responsible manner to the Arctic Council, relevant international fora, and Arctic populations.

3. THE APPROACH TO MEET THE OBJECTIVES AND PRIORITIES

3.1 Guiding Principles

AMAP monitoring activities are based, to the greatest extent possible, on ongoing national and international monitoring and research; aiming to harmonize this work and where necessary promote new activities to fill identified gaps in order to meet the AMAP objectives. Certain projects of circumpolar importance, which are beyond National

Implementation Plans for AMAP (NIPs), may require international steering and financing mechanisms.

Close co-operation with other relevant regional and global programmes and observation networks, including data sharing and implementation of joint projects is essential to avoid duplication of activities, to ensure optimal use of available resources, and to fill gaps in fundamental scientific knowledge needed for realizing AMAP's objectives.

AMAP assessments are objective, scientifically-based assessments that utilise data and information from all relevant sources, as long as these are documented to be of sufficient quality.

The AMAP assessments are produced by scientific experts nominated by the eight Arctic countries, the permanent participants, and observing countries/organizations. The expert groups have the responsibility for the content of the scientific assessment reports. The AMAP Working Group are responsible for the production and content of reports that summarise the scientific assessments and contain statements concerning actions that may be recommended to Ministers for their consideration.

The involvement of indigenous populations of the Arctic in the work of AMAP, through representatives of Arctic Indigenous Peoples Organizations, is an underlying principle of the AMAP Strategy that has been implemented during Phases 1 (1991-1997) and 2 (1998-2003) of AMAP, and will continue to be so in the future.

AMAP has noted the advantages of applying, where feasible, the ecosystem approach (see <http://www.biodiv.org/decisions/default.aspx?m=COP-05&id=7148&lg=0>).

3.2 Data and information needs

Practical implementation of a circumpolar programme of measurements is based on coordinated national activities under the AMAP National Implementation Plans (NIPs) of the participating countries, supplemented by additional contributions from, e.g. non-Arctic countries and regional and international organizations. Work under national programmes of the Arctic States, etc., that cover regions outside of the Arctic but which are relevant to the Arctic is also included. AMAP cannot dictate the activities that are incorporated in the national monitoring/research programmes; it can however encourage the countries to include work to address AMAP priorities, and promote harmonization and coordination of the national activities. Such harmonization provides the potential for acquisition of comparable data on a circumpolar scale.

An important tasks of AMAP is to review and coordinate existing national programs, and to develop these programs when appropriate in an international framework.

Possibilities for conducting widescale and/or frequent monitoring in the Arctic are severely constrained by logistical and financial considerations. For some countries, therefore, much of the information used in the preparation of AMAP assessments is derived from short-term activities of restricted scope/duration, including research projects and cruises, rather than repeated national monitoring activities. These factors have implications with respect to the conclusions that can be drawn from data currently available regarding, e.g., spatial and temporal trends, and the uncertainties associated with these. Future AMAP assessments aim to improve the available data collection, and to set goals that are consistent with realistic prospects for data compilation.

Statistical evaluation of the programme components is desirable to ensure optimal and adequate temporal and spatial resolution. This includes evaluation of the designed

measurement and observation networks and their work programmes (sampling frequency, location of stations, etc.) in terms of their power to detect trends.

Information on NIPs can be found on the AMAP website (www.amap.no) and in the AMAP Project Directory (www.amap.no/Resources/ProjectDirectory.htm)

4. ASSESSMENT PRODUCTS AND PROCESS

4.1 Assessment Products

The comprehensive AMAP assessments such as those of 1997/98 and of 2002/04 have proven to be extremely valuable and widely used syntheses of information. However, their high demands for financial and human resources makes it difficult to sustain their production at the past frequency of approximately five year intervals. Furthermore, they cannot be produced quickly. AMAP has therefore developed an assessment strategy which includes a range of products designed to address both the need for periodic comprehensive assessments with the requirement to rapidly provide Arctic Council Ministers with authoritative information on the state of the Arctic environment. To effectively address the present mandate, assessments will be produced according to the following framework:

- **First Order Products**

These includes products requested by the Arctic Council or prepared for international organizations with whom specific cooperative activities have been identified by Arctic Council ministers as being crucial for protecting the Arctic Environment. Examples of requested products include:

1. Comprehensive circumpolar AMAP Assessment Reports such as those of 1997/98 and 2002/03. These will now be produced at approximately 10 year intervals. They may include reports that synthesize knowledge about a range of topics.
2. AMAP Reports on Issues of Concern. These reports will enable AMAP to rapidly inform Ministers and Senior Arctic Officials (SAOs) of key information resulting from the work of AMAP. A precursor to such reports is the 2000 AMAP Report to Ministers (*AMAP Report on Issues of Concern, AMAP Report 2000:4*). Such reports will be prepared for each Ministerial conference but may be produced more frequently if necessary. The objective is to provide a rapid, responsive and cost effective means of informing Ministers and SAO's on emerging issues relative to the responsibilities of AMAP.
3. Assessment information prepared to assist in evaluating the effectiveness and sufficiency of agreements for protecting the Arctic environment, including the POPs and Heavy Metals Protocols to the UN ECE LRTAP Convention, and the UNEP Stockholm Convention on POPs.

- **Second Order Products**

These are reports or contribution to reports produced and normally funded by international organizations and linked to existing AMAP activities. The Arctic Regional Report to the UNEP Chemicals Regionally Based Assessment of Persistent Toxic Substances (2002), the EU Kiev report (2003) and the NEFCO/AMAP reports (1995 & 2003) are examples of this type of work. Products of this nature are undertaken only when approved by the AMAP WG and following notification of the SAOs.

- **Third Order Products**

The objective of these products are to communicate AMAP information and results to a wider audience. They include: fact sheets, web-based information products, and reports to other Arctic Council Working Groups.

4.2. Assessment Process

During its first (1991-1997) and second phase (1998-2003), AMAP gained significant experience in organization of the assessment process, and developed approaches to methodological and communication issues that ensured a successful delivery of the AMAP Assessment Reports.

In the following period 2004+ the following organizations principles will be maintained:

- **First Order Products**

Preparation of the AMAP assessments will be overseen and coordinated by an Assessment Steering Group (ASG) consisting of experts approved by the AMAP Working Group. Accountability for the content of the scientific reports will rest with the contributing scientists. The Working Group will be responsible for summaries prepared for SAOs and Ministers. The first order reports prepared for international organizations will be strictly factual in nature. They will be prepared under the oversight of the Assessment Steering Group and their transmittal to the international organizations will be approved by the Working Group. These reports will also be sent to SAOs.

- **Second Order Products**

The AMAP contributions will be prepared by the AMAP experts and/or the AMAP Secretariat. The contributions will be based on the content of the first order products, and other scientific information gathered under the auspices of AMAP work. Reports produced by third party organizations based on the AMAP contributions are the responsibility of the organizations concerned and these will not normally be subject to approval by the Working Group.

- **Third Order Products**

These products will be prepared by the AMAP experts and/or the AMAP Secretariat. The products will be based on the content of the first order products, and other scientific information gathered under the auspices of AMAP work. The AMAP Chair will have accountability for these products.

Details on the application of the principles for the production of any given product will be determined by the WG and/or the ASG and will be made available on the AMAP website, for example in The Guidelines for the Preparation of the AMAP Assessments. The schedule for production of AMAP assessments is presented in the AMAP Workplan that can be found on the AMAP website (www.amap.no)

4.3. Information Dissemination

All AMAP products are available as electronic documents through the AMAP website (www.amap.no). Printed reports, etc. can be obtained from the AMAP Secretariat or from Heads of National Delegations. AMAP assessment reports are produced in English. Some of these reports are also translated into other languages.

5. DATA ACQUISITION: *THE AMAP TRENDS AND EFFECTS PROGRAMME*

5.1 The AMAP Trends and Effects Programme

In order to be able to prepare its assessments, AMAP has developed the *AMAP Trends and Effects Programme*, comprising:

- the *AMAP Trend Monitoring Programme*, which covers observations on levels and trends of contaminants;
- the *AMAP Effects Monitoring Programme*, which focuses on effects of contaminants and other stressors on Arctic flora, fauna and humans, including combined effects; and
- additional *Supporting Studies*, to provide essential information necessary for development of assessment and valid interpretation of the results of the monitoring data.

Annex 2 presents the table of content of the *AMAP Trends and Effects Programme*. A detailed description of all components of the *AMAP Trends and Effects Programme* can be found on the AMAP website (www.amap.no).

5.2 Components of the trend and effects monitoring programmes

For long-term and combined effects monitoring activities special attention will be paid to *key areas* where most of the work will be performed, see Annex 3. *Key areas* are not single sampling sites, but rather are extended areas where a number of coordinated monitoring and other observational activities should be performed.

Two types of *key areas* are defined:

- *background key areas*, which will deliver data on background levels of pollutants, combined effects and ecosystem health, and provide relevant observations to study climate change and UV-B effects;
- *impacted key areas*, which will deliver similar types of data and information, but in areas identified in the initial AMAP Assessments as being affected by one or more types of contamination.

Some key areas overlap the territories of several countries; in such cases, possibilities are exploited for cooperation between countries to ensure an optimal cost-effectiveness in work to meet AMAP needs.

Other stations may be established in areas that are particularly impacted by one or more types of contamination, climate change, or UV radiation; and/or that are of importance for inclusion in the AMAP programme due to their feasibility to provide representative effects studies on humans and wildlife, to provide data on transport fluxes (e.g. in rivers and estuaries), or presence of human settlements or activities (e.g. mining activities, previous use of nuclear explosions for engineering projects, etc.). Stations in estuaries constitute an important sub-category of marine stations.

5.2.1 Atmospheric Monitoring

The primary network of long-range atmospheric transport monitoring stations, particularly for POPs, and associated methodologies have been developed during earlier AMAP activities. Additional monitoring stations need to be established, taking into account gaps in geographical coverage (e.g., eastern part of the Eurasian Arctic), and additional variables included in the circumpolar Arctic monitoring programme (e.g., mercury).

Since the LRTAP EMEP monitoring network for acidifying compounds covers only part of the Arctic region, additional monitoring and research activities are required to provide relevant information on other areas of the region.

5.2.2 Terrestrial/freshwater monitoring

Although terrestrial and freshwater environments will be monitored separately, using methodologies and programmes of observation (sampling, analytical protocols, etc.) appropriate to the compartments concerned, they are often considered as a 'joint environment'.

Assessment of the transport of contaminants (and other aspects of inter-compartment interaction) requires that freshwater and terrestrial observations be integrated, and implemented within the borders of the same monitoring (key) areas, using common monitoring stations, etc. Terrestrial/freshwater monitoring stations will be linked to atmospheric monitoring if necessary (e.g., in areas where significant local sources of atmospheric emissions exist).

A network of stations within a limited number of key areas will form the basis of future AMAP terrestrial/freshwater monitoring activities, where most of the long- and short-term monitoring programmes will be implemented. These key areas will cover rather extended territories in which different elements of the trend and effects programmes can be implemented.

5.2.3 Marine monitoring

The marine circumpolar monitoring network is designed to cover the most important marine areas regarding productivity (fish and marine mammals) and global scale processes, including the coastal zone, and to address, to the extent possible, one of the drawbacks of previous marine monitoring activities, namely the uneven spatial distribution of sampling sites.

5.2.4 Human health

The human health activities will focus on exposure and the effects on human health of different pollution issues, both the effects of specific contaminants and combined effects. The human health work will be supported by information from other components of the AMAP Trends and Effects Programme. To ensure effective integration between the human health studies and other components, human health monitoring activities may be conducted within key areas. Additional human health monitoring activities will be carried out in settlement areas of indigenous and local populations that are of special interest, but not covered by key areas.

5.2.5 Climate change and UV

As part of its monitoring programme development, AMAP has elaborated a sub-programme that includes detailed recommendations concerning measurements and observations required to assess the effects of climate change and UV radiation in the Arctic.

The ACIA includes recommendations for additional research, observations, monitoring and modeling, and SAOs have emphasized the particular importance of focussing on those research needs that play a significant role in developing and applying mitigation and adaptation measures.

The AMAP climate change programme will be further developed to address ACIA recommendations, with a view to implementing, in cooperation with other relevant organizations, a circumpolar programme of monitoring and research that will provide

information on climate change and the effects of climate change and UV in the Arctic that is both reliable and sufficient to meet the needs of future policy development.

5.3 Supporting studies

Supporting studies are essential additional components of the *AMAP Trends and Effects Programme*, to provide detailed information necessary for future assessments and to allow valid interpretation of the results of the Monitoring Programme. Supporting studies comprise the following:

- Surveys (intensive short-term observations);
- Supporting studies linked to monitoring of contaminant trends and effects;
- Data and information acquisition relating to sources of pollution; and
- Modelling studies to support the AMAP Assessments.

The content of the supporting studies will vary depending on the specific needs of AMAP.

5.3.1 Surveys

Surveys will be organized where:

- the previous AMAP Assessments have shown a gap in knowledge on a certain pollution issue, either in a circumpolar context or in areas where existing information suggests that this issue may be significant; or
- results of the previous AMAP Assessments have demonstrated that, for some pollution issue(s), a certain geographical areas differs from other Arctic areas in a manner that cannot be explained using the available information.

If new issue of concern arise, a survey (preferably on a circumpolar scale) may be arranged to enable well-founded recommendations to be made concerning possible further work or actions that need to be taken.

5.3.2 Supporting studies linked to monitoring of contaminant trends and effects

Supporting studies linked to monitoring of contaminant trends and effects cover a broad range of activities. These include both monitoring and research studies that provide data and information which, while not being collected under the main coordinated activities of AMAP, are, nonetheless, essential for producing a complete and valid assessment of pollution issues.

Examples of such supporting studies include:

- (1) National and international programmes producing basic hydrological and meteorological data that are, in particular, required for assessment of contaminant pathways and fluxes.
- (2) Retrospective trend studies. Retrospective trend studies may involve:
 - sampling and analysis of environmental media that provide information on concentrations of contaminants in previous years (e.g., cores of ice, soil, and sediments); or
 - analysis of specimen bank samples, including non-destructive analysis of museum samples.

It is essential to include such activities in the monitoring programmes for key areas in order to obtain longer time trend series.

- (3) Detailed food-web studies in selected ecosystems.

- (4) Process studies that, for example, contribute to the understanding of how contaminants move through the environment; e.g., processes influencing atmospheric-surface exchange, contaminant speciation and uptake, etc.
- (5) Work conducted under bi- and multi-lateral studies, both between Arctic states and those involving non-Arctic states.

5.3.3 Data and information acquisition relating to sources of pollution

In the list of Actions for AMAP from the 1991 Rovaniemi Ministerial meeting, the need for "*estimates and regular reporting by the Arctic countries of contaminant emissions and discharges, including accidental discharges, as well as transport and deposition*" is identified as a requirement to allow AMAP to distinguish human-induced changes from changes caused by natural phenomena.

For sources located within the Arctic unified approaches have been developed and employed in AMAP work contributing to, e.g., the AMAP/NEFCO Project in the Russian part of the Barents region, ACAP projects including Phase 1 of the '*Multilateral Cooperative Project on Phase-out of PCB Use, and Management of PCB-contaminated Wastes in the Russian Federation*', and the RAIPON/AMAP/GEF project on '*Persistent Toxic Substances and Food Security of Indigenous Peoples of the Russian North*'.

For sources located in the territories of the Arctic States, both within and outside the Arctic region, methodologies adopted by relevant international programmes, such as EMEP and OSPARCOM, should be followed.

Information is also required on global emissions of certain contaminants (e.g., POPs and mercury), including emissions from source regions far remote from the Arctic, in countries with no direct relationship to the Arctic Council or its groups. In such cases, cooperation with established initiatives compiling relevant information, such as GEIA and UNEP-Chemicals is desirable.

It is also important that all reported emissions and discharges data and statistics are verified with scientific observations and/or modelling results and special attention needs to be paid to harmonization of source data reporting, both among the participating countries and in international programmes/organizations that can provide source characterization information to AMAP.

5.3.4 Modelling studies in support of the AMAP Assessments

A process is ongoing to bring together modellers and to encourage their active involvement in work that will contribute to future AMAP assessments, including assessment of the effects of climate change and UV radiation. Requirements and recommendations concerning model development and application have been specified and these will be addressed by AMAP and also raised within other relevant international fora to facilitate further development and implementation of modelling work that will meet AMAP needs.

6. DATA HANDLING AND QUALITY ASSURANCE

6.1 Thematic data centres and data reporting

As a part of the *AMAP Trends and Effects Programme*, and to ensure that the results of recent monitoring and research are made available for the AMAP assessments, an AMAP Data Policy has been developed (see the *AMAP Trends and Effects Programme* documentation).

AMAP Thematic Data Centres (TDCs) are a key component in ensuring that reliable data are made available for the AMAP assessments. TDCs for atmospheric, marine, and freshwater/terrestrial data, and for data on radioactivity are currently established. Data on contaminants in human media and related human health data are being compiled at the AMAP Secretariat. It is expected that all of the TDCs will be fully operational to support AMAP activities during the period 2004+. AMAP TDC activities are coordinated with other international programmes to achieve cost/efficient data handling and to avoid duplication of work in data reporting, etc.

6.2 Specimen banking

Development of specimen banking activities has been identified as a priority activity for attention during the second phase of AMAP, to document AMAP data through archived abiotic and biotic materials and to provide possibilities for sample sharing and future analysis (retrospective trends, etc.). It is hoped that Arctic samples will be archived on a national or regional bases, with AMAP participating actively in international work to establish and operate the specimen banks.

6.3 Quality assurance/quality control procedures

Since AMAP is based mainly on existing national programmes, each of which employs its own methodologies and QA/QC procedures, work aimed at harmonizing these activities and promoting the use of intercomparable methods is essential. The initial AMAP Assessments have shown that there are still substantial deficiencies in data quality that need to be addressed. These issues are dealt with in the *AMAP Trends and Effects Programme* (see the *AMAP Trends and Effects Programme* documentation).

The AMAP programme does not aim to create its own QA/QC programme or intercomparison systems, but rather to promote (or require) participation of AMAP associated laboratories in existing relevant national and international QA/QC programmes.

ANNEX 1: Background information on the Arctic Monitoring and Assessment Programme (1991-2003)

At the First Ministerial Conference on the Arctic Environmental Protection Strategy (AEPS), held in Rovaniemi, Finland in June 1991, Ministers of the Arctic States established the Arctic Monitoring and Assessment Programme (AMAP) to "*monitor the levels of anthropogenic pollutants in relevant compartments of the Arctic environment*". Ministers further identified the key pollutants that should be priority during the first phase of AMAP (1991-1997). At the Ministerial Conference in Rovaniemi, Finland (1991), persistent organic contaminants, heavy metals and radioactivity were recognized as the environmental pollution issues of first circumpolar priority. The Ministerial Conferences in Nuuk, Greenland (1993) and Inuvik, Canada (1996), extended this list to include: acidification and Arctic haze, and petroleum hydrocarbon pollution, in a subregional context; and environmental consequences of, and biological effects due to global climate change and stratospheric ozone layer depletion, relevant to the Arctic. At the First Meeting of the Arctic Council, in Iqaluit, 1998, Ministers requested CAFF (the Arctic Council group on Conservation of Arctic Flora and Fauna) to monitor and assess "in collaboration with AMAP, the effects of climate change and UV-B radiation on Arctic ecosystems". At their Second Meeting, in Barrow, 2000, the Arctic Council endorsed the Arctic Climate Impact Assessment (ACIA) as a joint project between AMAP, CAFF and IASC.

From its inception, AMAP was conceived as a process integrating both monitoring and assessment activities in relation to pollution issues, to provide information for:

- producing integrated assessment reports on the status and trends of the conditions of Arctic ecosystems;
- identifying possible causes for changing conditions;
- detecting emerging problems, their possible causes, and the potential risk to Arctic ecosystems including indigenous peoples and other Arctic residents; and
- recommending actions required to reduce risks to Arctic ecosystems.

To meet the requests of the Ministers, the Arctic States, with active participation of the observing countries and organizations, developed and implemented the Monitoring Programme for AMAP; a coordinated programme to monitor the levels of pollutants and assess the effects of pollution in all compartments of the Arctic environment (the atmospheric, terrestrial, freshwater and marine environments, and human populations).

AMAP monitoring activities are based, to the greatest extent possible, on ongoing national and international monitoring and research; aiming to harmonize this work and where necessary promote new activities to fill identified gaps in order to meet the AMAP objectives.

Active participation of International Indigenous Peoples Organizations in all stages of the process played an important role in realizing the AMAP objectives during Phase 1 and 2.

AMAP assessments are performed according to agreed guidelines, and was based on data and information already published in scientific literature, data and information obtained from AMAP's monitoring programme, and traditional knowledge.

The assessment process for Phase I of AMAP (1991-1997) produced a report entitled *Arctic Pollution Issues: A State of the Arctic Environment Report (SOAER)*, which was presented to the Fourth AEPS Ministerial Conference (Alta, Norway, June 12-13, 1997). The

comprehensive SOAER was based on information contained in the more detailed scientific and fully referenced *AMAP Assessment Report: Arctic Pollution Issues (AAR)*, which was presented to the First Ministerial Meeting of the Arctic Council (Iqaluit, Canada, September 17-18, 1998).

The assessment process for Phase II of AMAP (1998-2004) produced a report entitled *Arctic Pollution 2002* presented to the Third Arctic Council Ministerial Conference (Inari, Finland, October 9-10, 2002). This report updated the previous AMAP assessments on persistent organic pollutants, heavy metals, radioactivity, and human health, and included information on the influence of climate change on contaminant pathways. Five scientific reports detailing these issues were published in 2003/2004.

In 2004, AMAP, together with CAFF and IASC, delivered the Arctic Climate Impact Assessment (ACIA). The ACIA Overview report *Impacts of a Warming Arctic* was presented at the Fourth Arctic Council Ministerial Conference (Reykjavik, Iceland).

Two other major projects completed in 2004, were:

The project *Persistent Toxic Substances, Food Security and Indigenous Peoples of the Russian North*. This major three-year project was coordinated by the AMAP Secretariat on behalf of the Russian Association of the Indigenous Peoples of the North, Siberia and Far East (RAIPON), and implemented based on funding from the Global Environment Facility (GEF), the Arctic countries, and other sponsors.

The project *Updating of Environmental 'Hot Spots' List in the Russian Part of the Barents Region: Proposal for Environmentally Sound Investment Projects* was conducted by the AMAP Secretariat for the Nordic Environment Finance Cooperation (NEFCO), to update earlier reports on this subject produced by AMAP for NEFCO.

AMAP assessment reports can be ordered from the AMAP Secretariat and are available as electronic documents from their AMAP website, for further information see www.amap.no.

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ANNEX 3: AMAP Key Areas

