



Ympäristöministeriö  
Miljöministeriet  
Ministry of the Environment

# Environmental Science in the Arctic Context

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## Report



Embassy  
of the Federal Republic of Germany  
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## Introduction

Environmental protection is at the core of the work of the Arctic Council and it is also one of Finland's priorities during the two-year Arctic Council Chairmanship. The Working Groups of the Arctic Council play an essential role in compiling science-based information on the changing Arctic environment. Several scientific institutions produce high quality Arctic research and data and contribute to the work of the Council.

This trilateral seminar was organized by the Ministry of the Environment of Finland and the Finnish Environment Institute in cooperation with the German Arctic Office and the German Embassy in Helsinki as well as the Institut Français and the French Embassy in Helsinki. The main objective was to learn more about the work carried out by the Arctic Council and about the interlinkages to Arctic science carried out by other institutions. Furthermore, the good cooperation and exchange of information with the Arctic Council Observer countries France and Germany as co-organizers of this event was presented. The Seminar was co-funded by the three organizing countries, by the German Federal Foreign Office, the Ministry of the Environment of Finland and French Embassy in Helsinki.

## Opening Session

The **Minister of the Environment, Energy and Housing of Finland, Kimmo Tiilikainen** opened the seminar and welcomed the participants at the House of Estates in Helsinki. He mentioned that the Arctic is especially in focus in Finland this year, because the country is chairing the Arctic Council until 2019. Cooperation in the Arctic region started in 1991 in Rovaniemi, when the Arctic Environment Protection Strategy was adopted at the first Arctic Ministerial Meeting. Environmental science has been from the beginning an integral part of the Arctic Council. His speech was followed by **Ambassador Aleksi Härkönen, Chair of the Arctic Council Senior Arctic Officials**. The Ambassador thanked the co-organizers for this event and introduced the program of Finland as the Chair of the Arctic Council. The chairmanship program is built around four priorities, one of them being the protection of the environment.

The **Ambassador of the Federal Republic of Germany, Detlef Lingemann**, and the **Ambassador of the French Republic, Serge Tomasi**, thanked the organizers for initiating the seminar and underlined that international scientific cooperation between all actors must be strengthened. Germany and France should not be passive bystanders but play a leading role in research about the Arctic.

# Session 1: Protection of Arctic flora and fauna and sustainable use of renewable and natural resources

**Moderator: Volker Rachold, German Arctic Office**

The first speaker was **Aulikki Alanen, Finland's representative in the Arctic Council Working Group Conservation of Arctic Flora and Fauna (CAFF)**. CAFF is the biodiversity Working Group of the Arctic Council. Its mandate is to address the conservation of Arctic biodiversity, to communicate its findings to the governments and residents of the Arctic and to help to promote practices which ensure the sustainability of the Arctic's living resources. Its activities include assessments, monitoring, data management, conservation strategies and action plans, international cooperation and education and outreach

The introduction was followed by three presentations introducing French, Finnish and German activities on Arctic biodiversity and science in the CAFF context. The speakers conveyed the below key messages.

## **Jérôme Fort, CNRS (French National Center for Research), France**

- Develop large-scale, international initiatives performed at the pan-Arctic scale to fully grasp spatial variability in ecosystem vulnerability and identify sensitive hotspots for biodiversity conservation
- Support and continue long-term monitoring programs, essential to study and understand impacts of environmental modifications on the Arctic wildlife
- Promote international cooperation for the conservation of migratory species connecting the Arctic with southern regions
- Conduct researches with ecosystem, multi-species approaches (to include interactions between different components of food-webs)
- Promote participatory science programs involving indigenous participants. Training and empowerment to tackle Arctic conservation issues

## **Atte Korhola, University of Helsinki, Finland**

- There are several threats to Arctic biodiversity, including climate change, industrial development, pollution, local disturbances, overharvesting, increased disease risks, invasive species and migratory species outside Arktikum
- There are significant knowledge gaps in assessing the Arctic biodiversity, in particular with regard to the population densities, sizes and trends, distributional patterns of species, aquatic non-native species, fish and crustacean stocks as well as cumulative impact of several stressors.
- Processes that are essential to the preservation of the Arctic environment should be taken more into account by future research, as they have been disregarded although their impact is considerable
- The worst-scale scenarios are related with the extinction risk of arctic-alpine species as well as non-linear changes and abrupt regime shifts, i.e. large and persistent changes in the structure and functions of ecological systems, with substantive impacts on the suite of ecosystem services provided by these systems.

## **Arne Riedel, Ecologic Institute, Germany**

- German policy guidelines and institutes' activities include scientific research as well as the protection of Arctic biodiversity
- German activities and projects are providing support for current Arctic Council's (and CAFF's) priorities
- Information exchange and cooperation is taking place on several activities but still leaves room for more
- Intensifying the cooperation of Arctic Council Observers with Arctic Council Member States is crucial to achieve the ambitious goals for biodiversity protection in the Arctic

## Session 2: Monitoring Arctic environment, climate change and harmful substances and assessing their impacts

**Moderator: Outi Mähönen, Finland's representative in the Working Group AMAP**

**Marianne Kroglund, Chair of the Arctic Council Working Group Arctic Monitoring and Assessment Programme (AMAP)** briefly introduced the AMAP working group of the Arctic Council which is mandated to monitor and assess status and trends of climate change and pollution in the Arctic, assess their effects on ecosystems and humans, and provide science-based policy recommendations. AMAP has produced numerous scientific reports since its establishment. AMAP's future priorities include work on mercury, short lived climate pollutants, and Arctic climate issues and ocean acidification, as well as communication of results of AMAP assessments, improve the science and monitoring underpinning assessments, and enhance cooperation with observers and international organizations.

Key messages from specific AMAP activities were presented by three Finnish AMAP collaborators.

**Kaarle Kupiainen, Finnish Environment Institute**, reported on AMAP's global cooperation on climate change and short-lived climate pollutants:

- Implementation of the Arctic Council Framework for Action on Black Carbon and Methane
- AMAP 2021 scientific assessment on SLCPs
- Demonstration projects
- Strengthen the co-operation between the Arctic Council groups
- Outreach to other relevant fora, i.e. CLRTAP, CCAC, IMO

**Monica Tennberg, University of Lapland, Arctic Centre**, presented AMAP's regional cooperation within the Adaptation Actions to a Changing Arctic project in the Barents region:

- Complexity of change is the issue
- Climate change and other driving forces
- Multilevel adaptation governance
- Adaptation is a political process
- Complacency is the main threat

Finally, **Timo Vihma, Finnish Meteorological Institute**, addressed the role of inter-governmental collaboration in Arctic climate change research:

- Need for more and better observations from the Arctic, further improvement of climate models and predictions, revision and assessment of existing knowledge and its gaps, and education of new experts.
- Need for international commitment to sustain critical observation infrastructure, campaign observations and data management for the Arctic
- Need for shared resources to facilitate North American- European – Russian – Asian collaboration in the Arctic and for better integration and coordination of activities of different programs involved in Arctic in situ observations

Summaries of German and French AMAP related activities were presented by:

**Andreas Herber, Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research, Germany**

- AWI's research Infrastructure (icebreaker Polarstern, Polar aircraft, AWIPEV base) are a powerful tool to support scientific and logistic activity in the Arctic.
- AWIPEV is the jointly operated French-German Arctic Research Base with long term observations of climate change and its effects on the biota in the Atmosphere, Permafrost, glaciers and marine ecosystem.
- YOPP - Enable a significant improvement in environmental prediction capabilities for the polar regions, by coordinating a period of intensive observing modelling, prediction, verification, user-engagement and education activities.
- MOSAIC - The overarching goal of the international drifting observatory is to improve the understanding of coupled atmosphere-ice-ocean-ecosystem processes in the central Arctic.
- Ship emission experiment will do to investigate their influence for the Arctic Environment and projection of future shipping activity with the aim to deliver contribution for a Sustainable Shipping in the Arctic

**Kathy LAW, LATMOS/CNRS – Paris, France**

- French CNRS/University labs contributing to AMAP research on SLCFs (black carbon, ozone, methane), mercury/contaminants, climate change, ocean acidification (national (CNRS, ANR, IPEV, CNES, ...), EU & international projects)
- Arctic pollution is an international issue – improve understanding of remote and local emissions through coordinated trans-disciplinary approach (natural/social sciences, economics, local knowledge)
- Enhance coordination of research on air pollutants and contaminants (e.g. common emission sources)
- Continue efforts to increase collaborative research in Russia
- Strengthen collaboration to increase Arctic observing capacity (joint platforms/campaigns, monitoring, access to infrastructure (e.g. ice breakers, aircraft), satellite missions (e.g. CNES/DLR MERLIN (methane))

## Session 3: Impacts of increasing human activities and protecting the Arctic marine environment

**Moderator: Kathy LAW, LATMOS/CNRS – Paris, France**

**Anita Mäkinen is co-Chair of the Arctic Council Task Force on Arctic Marine Cooperation (TFAMC).**

In addition, she participates in the work of the Arctic Council Working Group on Protection of the Arctic Marine Environment (PAME). PAME addresses marine policy measures and other measures related to the conservation and sustainable use of the Arctic marine and coastal environment in response to environmental change and from both land and sea-based activities, including non-emergency pollution prevention control measures. As opposed to scientific assessments, PAME serves more a policy function and relies on existing and emerging science work within and outside of the Arctic Council. In the context of non-emergency policy related to Arctic marine pressures or stressors, PAME considers a range of marine-related activities such as shipping (e.g. use of Heavy Fuel Oil, Arctic shipping traffic database, collaboration with international organizations such as International Maritime Organization, IMO) area-based management (including the implementation of the Pan-Arctic Network of Marine Protected Areas and ecosystem approach to management), resource exploration and development and pollution.

The key messages of German, French and Finnish activities in the context of Arctic Marine Protection were presented by:

**Dieter Piepenburg, Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research, Germany:**

- Germany has a growing interest and is strengthening its Arctic engagement (foci: research, technology, governance),
- is investing heavily in polar science and logistics, and has one of the largest Arctic research programs,
- seeks to cooperate more closely with Arctic Council members (States, Permanent Participants, Observers) in the fields of research, environmental protection, and sustainable development and
- contributes with ongoing/future research activities to major themes of PAME.

**Sébastien Gadai, Aix-Marseille University, CNRS ESPACE, France**

- Understand Arctic transformation in the context of global warming and globalization and analyze the impacts and consequences for the Arctic marine environment with several joint research programs founded by French research agencies and Arctic Council member states.
- Environmental issues are one of the key elements of the French Arctic policy
- Work with policies, standards, rules and implementations across different conventions and bodies, like the Arctic Council, IMO, OSPAR, CBD, etc.
- Contribute with French expertise, regulations, technics and approaches, in particular to PAME projects and Expert Groups.
- Apart from research, also education and training are important elements of the French approach in the Arctic and the contributions to the Arctic Council with several joint international Master programs, trainings, and internships.

**Hermann Kaartokallio, Finnish Environment Institute**

- Finnish marine research includes (1) Environmental and ecological research, (2) Arctic shipping and offshore technology, (3) Oil/chemical risks
- Environmental Research focusses on Arctic marine ecosystem functioning and ecosystem approach to management
- Scientific collaboration with French and German partners mainly in bilateral or EU-funded projects
- The marine science community in Finland is not very large, although marine research is internationally of high quality. Enhanced collaboration with Germany and France in the field of Arctic marine research would be beneficial

## Session 4: From environmental science to action in the Arctic

**Moderator: Paula Kankaanpää, Finnish Environment Institute**

The session was opened by **Paavo-Petri Ahonen, Finnish Ministry of Education and Culture**, who introduced the Agreement on Enhancing International Arctic Scientific Cooperation and its possibilities. **Volker Rachold** commented from an Arctic Council observer point of view. Furthermore, **Liisa Holmberg, Sámi Education Institute**, highlighted the importance of indigenous and local knowledge.

Concluding statements related to research-driven Arctic environmental protection from a Finnish, German and French perspective were presented by:

**Henna Haapala, Finnish Ministry of the Environment, Energy and Housing and Finland's representative in the Arctic Council Working Group Arctic Contamination Action Program (ACAP)**

- We need both global and local actions to solve the environmental issues in the Arctic
- - Global: environmental agreements, multilateral actions
- - Local: reducing own emissions and environmental impacts
- Arctic and global interlinkages are highly relevant in the environmental research
- We need scientific information and scientific co-operation to support informed decision-making across the Arctic.
- Traditional knowledge and local observations are important to recognize the changing conditions
- We need awareness raising at all levels, especially the local decision makers and stakeholders.

**Christian Lindemann, German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety**

- With the adoption of its Arctic Policy Guidelines in 2013, the German government committed to taking on responsibility with regard to developments in the Arctic. For the Federal Ministry for the Environment taking on this responsibility means advocating the highest possible environmental standards for all activities in the Arctic.
- Implementing the Paris Agreement is paramount for safeguarding the protection of the Arctic.
- There is a role for the Arctic Council in cooperation with OSPAR in the establishment of an ecologically coherent network of marine protected areas in the North-East Atlantic.
- Where science cannot yet provide guidance for decision-makers, precaution comes into the picture.
- Germany is profoundly interested in intensifying its cooperation on the issue of environmental protection in the Arctic with the Arctic Council in its many different working groups and in many different ways.

**Sébastien Gadal, Aix-Marseille University, CNRS ESPACE, France**

- Main drivers of the French Arctic policy are the French Roadmap for the Arctic, the Grenelle French Environmental Law and the Arctic Policy of the European Union
- The Global Pact for the Environment, a civil-society led initiative supported by France, will be the first international legally binding document, gathering and harmonizing all environmental laws
- The One Planet Summit was convened by the French President to address public and private finance in support of climate action
- One of the important issues where France with Germany, Finland, and European Union can contribute, concerns the monitoring of the Arctic by Earth Observation programs (Copernicus, SPOT, etc.). Data access is one of the main issues of the understanding of the Arctic transformations, and support of the economic development and environmental protection.
- France wants to improve the cooperation between EU countries and Arctic States and working groups of the Arctic Council.



## Executive Summary

The trilateral Finnish, German, French seminar Environmental Science in the Arctic Context, addressing the Finland's Arctic Council chairmanship priority on environmental protection, was held on 10 October 2018 in the House of Estate in Helsinki, Finland. It brought together more than 100 experts and policy makers from the field of environmental research and protection. Finnish, German and French speakers presented and discussed ongoing activities, national priorities and contributions to the work of the Working Groups of the Arctic Council.

Following the opening by the Finnish Minister of the Environment, Energy and Housing and the German and French Ambassadors, the seminar included three main sessions, each addressing themes which are relevant at the work of the Arctic Council. The steps from environmental science to decision-making were discussed in a concluding session. The following overarching recommendations were agreed upon:

- The threats to the environment of the Arctic are mostly related to global processes and thus require global in addition to local action. In that context, the implementing of the Paris Agreement and other multilateral environmental agreements is essential for the protection of the Arctic.
- Scientific information and scientific co-operation, complemented by traditional knowledge and local observations, are the fundament for informed decision-making.
- All activities in the Arctic should follow the highest possible environmental standards which should be defined based on science or precaution if science cannot provide guidance.
- The important role of the Arctic Council in the protection of the Arctic environment was underlined. Both Germany and France as Observer countries to the Arctic Council are striving toward intensifying their cooperation with the Arctic Council and its Working Groups.
- Finland, Germany, France and the European Union can substantially contribute to the protection of the Arctic environment by supporting the monitoring of the Arctic and by providing observational data.

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