



Arctic Research Programme

2014 - 2018

Programme memorandum

Arctic Research Programme, Programme memorandum

Preface

In 2011, the Academy of Finland's Research Council for Biosciences and Environment prepared an initiative on an Arctic research programme. All research councils gave their support to the initiative. In its meeting in autumn 2012, in connection with the adoption of the operational and financial plan for 2014–2017, the Academy Board made a decision to launch the preparation of the Arctic Research Programme.

A working group was set up to plan and prepare the programme on 24 April 2013. The working group was chaired by Professor Mari Walls (Research Council for Biosciences and Environment), co-chaired by Professor Juha-Pekka Lunkka (Research Council for Natural Sciences and Engineering), and the members were Professor Atte Korhola (Research Council for Biosciences and Environment), Professor Pirjo Markkola (Research Council for Culture and Society) and Professor Anneli Pohjola (Research Council for Health). The following persons from the Academy's Administration Office acted as experts in the working group: Science Advisers Kustaa Multamäki and Hanna Pikkarainen; Senior Science Advisers Jussi Lindström and Merja Kärkkäinen; Programme Managers Tuula Aarnio and Mikko Ylikangas; and Project Officer Sanna Hytönen.

In the preparation of the programme, account was taken of the views of the research councils, and external experts from various organisations were heard. In October 2013, the Academy of Finland held a research workshop relating to the preparation. A wide range of researchers and representatives of stakeholders and end-users were invited to attend the event. They were asked to comment on the draft programme memorandum drawn up by the Academy and the objectives and themes proposed therein, and to identify any knowledge gaps and research needs they deemed important. Advantage was taken of the feedback received from researchers in the finalisation of the programme memorandum and in defining the theme areas for the programme.

In autumn 2013, the Academy of Finland's Board made a decision on the funding to be reserved for the programme, which is included in the Academy's allocation authority for 2014. The planned duration of the research programme is four years, and decisions on potential additional funding rounds after the application process for 2014 will be made on the proposal of the programme steering group at a later date.

1. Background

The significance of the Arctic regions and the interest in Arctic areas has increased significantly over the past few years. An important contributing factor to this has been climate change, which is predicted to cause major changes in northern regions in particular. Now and in the future, the progress of climate change will be most noticeable in the Arctic regions, where natural climate variation is great and where the rise in the average global temperature is predicted to become at least



twice as high¹. People and communities of the north and the northern nature – including plant and wildlife populations – will have to adapt to climate change. Geopolitical reasons have also increased interest in the northern regions, since, as a result of global warming, sea ice and continental glaciers are melting, which facilitates more large-scale exploitation of offshore gas and oil reserves and continental mineral resources. According to estimates, more than 10 per cent of the world's as-yet undiscovered oil reserves and almost a third of gas reserves may be located in the Arctic region, and most of these are believed to be found in offshore areas². Global warming also facilitates more cost-efficient utilisation of mineral resources in the Arctic regions, including Canada's north, Greenland and Eurasia. As a result of the melting of sea ice, the possibility to use the Northeast and Northwest Passages for maritime transport for longer periods of time increases the exploitation potential of natural resources and enhances the geopolitical significance of the Arctic regions. Along with the increased geopolitical significance of the Arctic region, several non-Arctic countries have increased their visibility both in the Arctic region and on various political forums. For example, in May 2013 the Arctic Council approved China, India, Italy, Japan, South Korea and Singapore as observer members. The European Union has also applied for observer status on the Arctic Council.

Due to the globalising world economy and the economic growth of developing economies, the demand for energy and different raw materials has dramatically increased and therefore prospecting for and the exploitation of energy resources and mineral natural resources have significantly increased in the Arctic regions. However, exploitation of the oil and gas reserves and mineral resources in the offshore and continental areas in the Arctic region is challenging and associated with major environmental risks. Interest in tourism in the northern nature in its natural state is also increasing in all Arctic areas. The effects of the use of natural resources, tourism and other recreational use, as well as the building of relevant infrastructure is also visible in Finnish Lapland, which is currently undergoing a societal structural change. This has a major impact on the environment in the region as a habitat and living environment for both natural fauna and flora and people, as well as on the traditional livelihoods essential for the region's cultural identity, such as reindeer farming and fishing. Furthermore, the structural change concerns all livelihoods in the region and the opportunities to make a living in the north in general. Human activity and the changes in the environment and structures are intertwined and interactive at multiple levels. The impacts of human activity may lead to permanent environmental changes in the sensitive nature of the Arctic region. The Arctic states agree on the fact that exploitation of the region's natural resources must be ecologically and socially safe and sustainable.

Sustainable development consists of economic, social and ecological sustainability. The sustainable utilisation of natural resources requires a strong multidisciplinary knowledge base and the identification and anticipation of risks. Arctic research has very significant societal dimensions. Research data is needed, for example, for regional planning, land use planning, permit processes, legislation, economy, education, culture, services, health, and issues relating to social living conditions and changes in the communities, and decision-making in several forms, to ensure the management of regional development in accordance with the principles of sustainable development and justice³. It is largely a question of what kind of northern and Arctic existence the various processes and solutions produce. In recent years, Arctic states have therefore been making major

¹ *Science* 324 (2009): 1175–1179

² IPCC (Intergovernmental Panel on Climate Change) Fourth Assessment Report: Climate Change 2007

³ These principles are recorded in the strategies of all Arctic states and in Arctic Council documents.



investments in Arctic research and different studies conducted both nationally and in international cooperation. NordForsk is currently preparing a Joint Nordic Initiative on Arctic Research. The programme is scheduled for launch in 2014. The Research Council of Norway, in turn, has introduced an Arctic strategy and research funding cooperation on the subject with Russian research funding organisations. In February 2013, the United States published an Arctic research plan for 2013–2017. The Canadian government is actively investing in Arctic research stations. The Canadian High Arctic Research Station (Nunavut) will become operational in 2017. The United Kingdom is also currently conducting a five-year Arctic research programme (2010–2015, the Natural Environment Research Council). The Arctic research dimension will also be included in the EU's Horizon 2020 programme.

For Finland, being an Arctic country and with an Arctic population, the issues related to the Arctic region are essential. One-third of the people living north of the 60th parallel are Finnish. Finland outlined its Arctic policy goals for the first time in 2010 in *Finland's Strategy for the Arctic Region*. The fact that the Finnish Government decided to review its Arctic Strategy as soon as in 2012 reveals how rapidly the Arctic region has developed and how nationally important Arctic issues are for Finland. The new *Finland's Strategy for the Arctic Region*, steering the Arctic activities of various administrative sectors, was adopted in August 2013.

The need for Arctic research and the significance of the efficient use of broad-based and diversified knowledge is included in the 2013 strategy.

The Arctic region is undergoing a major transformation. Finland has leading expertise and know-how for understanding this transformation and on the ways in which to adapt to it, and even exploit it. The maintenance and development of such expertise and research is of primary importance. Finland strives to serve as a model for Arctic expertise both in research and in responsible commercial use of such expertise. The issues at the core of Finland's Arctic policy include understanding the global impacts of climate change; sustainable exploitation of Arctic natural resources; and the identification of framework conditions for the environment in all Arctic operations.

The transformation in the Arctic region is especially linked to climate change, the exploitation of natural resources, and land use, which are, at the same time, associated with the challenges caused by migration and the ageing population. The ongoing transformation relates extensively to changes in lifestyles, culture, identity and political life in the region. For example, the cumulative effects of climate change are a combined result of several components. Understanding these mechanisms and processes is a prerequisite for prospective remedying measures and drafting of adaptation strategies. To obtain sufficiently comprehensive and diversified knowledge, multi- and transdisciplinary high-quality research is required in the long term. Finland has a strong tradition in Arctic research both in higher education institutions and research institutes. Finland has also developed infrastructures for Arctic research that function well and have extensive exploitation potential. Finnish research expertise in the state of the environment and renewable natural resources monitoring; assessment of environmental development; and compilation of long-term research material is at the highest international level.

The Academy of Finland's Arctic Research Programme contributes to the strengthening of the position of Finnish Arctic research at the top of the international rankings, and promotes the identification of novel research paths and, consequently, new solutions. The timing is most opportune



for such a programme, since it promotes networking of researchers and research groups and cooperation with concurrent international projects.

The Arctic Research Programme is in keeping with the Academy's strategic goals and is also closely linked to the goal-setting of the Government Programme. One of the proposals for action included in Finland's Arctic Strategy (2013) is that, in order to ensure and strengthen broad-based Arctic research expertise in Finland, the Academy of Finland should launch an Arctic research programme, placing emphasis on multi- and transdisciplinary research and international cooperation. In accordance with the research policy laid down by the Academy Board, the themes of the research programmes should fit under the grand challenges faced by humankind it has identified, including the northern climate and environment; sustainable energy; dialogue of cultures; healthy everyday life for all; knowledge and know-how in the media society; and the ageing population and individuals. The themes of the Arctic Research Programme respond to these challenges in many respects.

2. Objectives

The main objectives of the Arctic Research Programme are:

- to produce new research knowledge on the multidimensional change processes in the Arctic region and the factors affecting these
- to strengthen transdisciplinary and problem-based Arctic research in Finland in the long term
- to disseminate new research knowledge to support decision-makers and stakeholders and for public discussion.

The other goals of the research programme are:

- to collect scattered strategic research capacity, special expertise and data materials to be used for multidisciplinary Arctic research
- to promote transdisciplinary cooperation in the field of Arctic research
- to boost international networking of Finnish Arctic research, thus also promoting the chances of researchers to put research infrastructures to efficient use
- to reinforce Finland's status as an internationally leading expert in Arctic issues
- to use and compile research data to respond to the identified grand challenges.

The research programme aims to strengthen the transdisciplinary and multidisciplinary approach within the field of Arctic research in particular.

The programme will create a knowledge base that further strengthens expertise related to northern conditions in various issues closely linked to the functioning of society. Examples of these include energy-efficient and cleantech solutions based on research; continuous monitoring and remote management systems of the Arctic environment and infrastructure; snow management solutions; ice-breaking and oil spill response and modelling related to sea ice; electronic social and healthcare services and remote medicine solutions; understanding of the interaction between culture and the environment; functional materials; and management of massive data materials and the development of services based upon these.



3. Thematic areas

The Arctic region is undergoing a major climate, environmental, geopolitical, economic and sociocultural transformation. In the Arctic region, the right of the residents to enjoy their own home region and the opportunities provided by it under changing circumstances are factors contributing to the good quality of life for citizens. The Arctic Research Programme is underlined by the objective to understand and analyse the hierarchy and different time spans of the changes affecting the Arctic region. With the help of the research programme it is possible to reinforce the systemic approach for identifying the mutual dependencies between human beings, the environment and structures. Scientific information about change management is needed in a future-oriented fashion, alongside a historical understanding of the changes impacting on the Arctic region.

At the core of the research programme is the aim to study and understand the change factors affecting the development of the Arctic region; the transformation process; the dynamics of change; and the various dimensions of sustainability linked to time and space in relation to the future of the Arctic region. The key questions are related to understanding economic, social, cultural and ecological change. Which of the identified changes are absolute and which are reversible? What are the mechanisms of change? What methods can be employed to manage change?

In other words, the research programme aims to generate new knowledge and approaches relating to the sustainable development of individuals and communities in terms of social life, health and culture; the sustainable exploitation of Arctic environments and natural resources; and the protection of sensitive Arctic ecosystems and securing the ecosystem services produced by them.

The research programme consists of four thematic areas, which are interconnected and non-exclusive. Below is a list of the key areas of research with a view of the programme given as examples included in these thematic areas. The list should not be considered a comprehensive demarcation of the programme.

- *Good-quality life in the north*
 - the nature of changes touching the Arctic region and the historical dimension of the changes: humans as objects adapting to change and active operators
 - survival of society and people in the Arctic region, and the changes in work, living conditions, communities, culture and identity
 - study of the basic situation of indigenous peoples and the development of culture-sensitive services, and the matching of provision and use of wellbeing services in the event of change
 - the transcultural and unique nature of the Arctic region: holistic research on the coexistence of ethnic groups
 - research on the human-nature relationship and, for example, the development of assessment methods for long-term environmental and social effects.

- *Economic activity and infrastructure in Arctic conditions*
 - framework conditions for sustainable economic activity and livelihoods and the ways in which they become defined in the Arctic regions




- research related to inventory, sustainable use and refining of Arctic natural resources, as well as issues related to logistical systems
 - research on environmentally sustainable and low-emission production systems developed for the Arctic regions
 - research on traditional livelihoods and the tourism industry in Arctic regions
 - sustainable use of natural resources, assessment of life-cycle impacts, and conflict resolution research.
- *The northern climate and environment*
 - long-span dynamics of Arctic ecosystems
 - Arctic ecosystems and climate: integrated research on interactive and feedback mechanisms
 - catchment area research: change in land use in the Arctic areas, nutrient dynamics, and carbon cycle
 - sustainable use of the biodiversity of the Arctic nature (incl. genetic biodiversity) and ecosystem services
 - research on the sustainability of the natural environment in the Arctic regions: research into environmental safety and risks related to environmental change.
- *Cross-border Arctic policy*
 - long-term review of cross-border Arctic policy (history, current status, predicted development)
 - research on the interaction between local, regional and global governance and policy
 - integrated research concerning the operating principles of Arctic institutions, corporate responsibility and economic development and framework conditions of societies
 - research on the mechanisms and best practices required by sustainable development of and safety in the Arctic region
 - research concerning democracy and equality in the Arctic regions, taking into account indigenous peoples, gender and the main population of the region.

In all thematic areas, it is hoped that the research questions will identify the needs for knowledge placed at the core of the Arctic Research Programme. Information is needed on change factors, the dynamics of change, and various dimensions of sustainability in relation to the future of the Arctic region.

The thematic areas have an integrative nature, and use multi- and transdisciplinary methods of research. Each thematic area makes it possible to combine the areas of expertise of researchers representing different disciplines. The research plans of projects seeking funding must be related to one or more thematic areas.

It is hoped that the projects proposed for the Arctic Research Programme will include:

- a multi- and transdisciplinary approach
 - a critical and innovative research approach on the subject
 - use of existing data materials and time series
 - concrete international research cooperation.
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4. Implementation

The Arctic Research Programme aims at strengthening multi- and interdisciplinary research in the field represented by the programme. All projects included in the programme will be encouraged to establish research collaboration that integrates both multi- and interdisciplinary approaches.

4.1 Funding

The Arctic Research Programme is a four-year research programme (2015–2018) funded and coordinated by the Academy of Finland. Through the programme, funding is provided to multidisciplinary research conducted by research projects and consortia with a view to supporting national cooperation and networking. A research consortium is a collaboration of independent fixed-term projects working under a joint research plan by combining different methods and research fields with a view to achieving greater added value than is achieved by normal project collaboration. The research programme's funding budget for 2014 is EUR 11 million.

4.2 National and international cooperation

4.2.1 National cooperation

The Academy of Finland's Arctic Research Programme is set to include collaboration with Tekes' programmes. There are interfaces between the Arctic Research Programme and Tekes' upcoming programme "Arctic Seas" (2014) and the strategic initiative about the Arctic environment and its opportunities (2012–2013 with possible extension). This will create an excellent framework for collaboration between the programmes. Tekes also opened a call in autumn 2013 for top Finnish space projects. One of the goals of that call is to strengthen expertise in relation to the Arctic environment and business and industry.

The Arctic Research Programme is also associated with the Academy's upcoming research programme New Energy (2014) and the ongoing research programmes FICCA (climate change) and AKVA (aquatic resources).

In November 2013, the Academy opened a targeted call entitled Sustainable Economy and Infrastructure in Arctic Conditions. The projects funded within that call will later be included in the Arctic Research Programme.

4.2.2 International cooperation

The Arctic Research Programme aims to selectively establish cooperation with research funding agencies in other countries that are committed to supporting leading-edge scientific research and with whom collaboration in Arctic issues could be beneficial for Finnish research.

In June 2013, NordForsk decided to start preparing a joint Nordic research programme on the Arctic. The Academy of Finland will participate in these preparations.

The Academy also participates in funding cooperation within the EU's framework programmes (FP7 and the new Horizon 2020) with a view to increase collaboration between researchers by, for instance, providing funding for joint calls. The Academy is also involved in the EU Joint Programming Initiative JPI Climate. The second theme of the JPI Climate call (Nov 2013) is Russian Arctic & Boreal Systems. The Finnish projects funded within that call will later be included in the Academy's research programme FICCA. Arctic issues will most likely figure in the EU Joint Programming Initiative JPI Oceans as well.



The Academy of Finland's Arctic Research Programme will include cooperation with Russian research funding agencies. The Academy and the Russian Foundation for Basic Research (RFBR) opened a joint call in geosciences in October 2013. The themes of the call partly concern Arctic research. The Academy has also negotiated on possible funding cooperation with the Russian Foundation for the Humanities (RFH) and the Russian Academy of Sciences (RAS).

The Academy of Finland is also following closely the preparation of an international initiative on Arctic research collaboration (Belmont Forum Collaborative Research Action – Arctic). The International Institute for Applied Systems Analysis (IIASA) also invests in Arctic research. The Academy's goal is to promote researchers' collaboration opportunities with IIASA.

Decisions on other international collaborations will be made at a later date.

4.3 Schedule

Within the programme, funding will be provided to individual projects and consortium projects for a maximum of four years. The funding period will start on 1 January 2015 and end on 31 December 2018. A detailed schedule for the call and the review of applications is given in Chapter 5 of this memorandum. A kick-off seminar will be arranged in early spring 2015. The Academy will separately announce the funding partners, thematic areas, schedules and application processes of any additional calls to be launched.

4.4 Steering group

The research programme is run by a steering group composed of members of the Academy's research councils and other expert members. Additional experts may also be invited to the group. The duties of the steering group are:

- to prepare the programme and submit to the programme subcommittee a proposal on projects to be funded
- to make a proposal to Academy research councils and other funding bodies on any new calls and/or additional funding
- to manage and monitor the programme
- to steer programme coordination
- to be responsible for the final evaluation of the programme
- to promote the application of research results produced within the programme.

The members of the steering group:

Chair Professor Mari Walls (Research Council for Biosciences and Environment), co-chair Professor Juha-Pekka Lunkka (Research Council for Natural Sciences and Engineering), and the members Professor Alfred Colpaert (Research Council for Biosciences and Environment), Professor Pirjo Markkola (Research Council for Culture and Society), Professor Anneli Pohjola (Research Council for Health), Director Kimmo Kanto (Tekes), Counsellor of Education Annu Jylhä-Pyykönen (Ministry of Education and Culture) and Research Director Laura Höijer (Ministry of the Environment).

4.5 Programme coordination

The research programme strives to support and promote the development of the selected projects into a coherent and cohesive structure through cooperation and exchange of information. The programme coordination is the responsibility of the steering group and the programme managers and project officer appointed by the Academy. They are responsible for ensuring this development and



work closely with the projects to facilitate the attainment of the objectives set for the programme. The aim is to ensure that the projects reinforce each other and that the programme generates new multidisciplinary research knowledge. Consequently, the principal investigators (PI) of the projects selected to take part in the programme will be required to commit themselves to the programme objectives and to cooperate actively throughout the programme and during the programme evaluation upon its completion.

The PIs of the projects are required to:

- assume responsibility for and report on the scientific progress of the project and on the use of the funds in accordance with the instructions of the programme manager and relevant funding bodies
- see to that the whole research team attends all meetings, seminars and workshops organised by the programme coordination, and facilitate cooperation and exchange of information between the research teams within the programme
- take part in producing reviews, syntheses and information material around the research programme, and actively disseminate information about the programme's progress and results on public and scientific forums.

During the course of the programme, the research projects will participate in events arranged together with end-users of research results and in any other activities designed to provide information to different stakeholders.

4.6 Evaluation

The implementation and results of the research programme will be evaluated upon its completion. The implementation of the evaluation will be planned in detail as the programme progresses, but the evaluation will consider, for instance, the following issues:

- attainment of programme objectives
- programme implementation (coordination, role of steering group, programme participation)
- evidence of impacts pursued by the programme
- national and international cooperation
- publicity and visibility of research conducted within the programme.

The evaluation may be carried out as part of a more extensive evaluation of Academy research programmes or other national programmes and in cooperation with other national and international actors.

The research teams receiving funding are required to annually report on the progress of their projects in accordance with the decision of the steering group and to submit a research report to the Academy of Finland upon project completion. The reports must include information on, for example, scientific publications produced and theses and doctoral dissertations completed within the programme.

5. Application guidelines and review criteria

The Arctic Research Programme has a two-stage call. At the first stage, applicants submit letters of intent including short plans of intent (see guidelines in the Academy's April 2014 call for applications). **The deadline for letters of intent is 29 April 2014 at 16.15. The deadline is non-negotiable.** The steering group will make a proposal to the programme subcommittee appointed by the Academy Board on projects that would best fit in with the programme aims on the basis of the letters of intent.



The projects selected to proceed to the second stage (to submit full applications) will be notified of the steering group's decision in June 2014.

Applicants requested to submit full applications shall prepare a complete research plan and submit it in the Academy's online services no later than 15 September 2014 at 16.15 (see guidelines in the Academy's April 2014 call for applications). The deadline is non-negotiable. On the basis of the scientific review of the applications and considering the programme aims, the steering group will prepare a proposal to the programme subcommittee on the projects to be funded. The subcommittee will make the funding decisions in December 2014 at the latest. Any additional, supplementary calls will be carried out according to a separately agreed timetable.

The letters of intent will be reviewed by an expert panel composed of members of the steering group and possible other experts. The full applications will be reviewed by an international expert panel.

The applications will be reviewed in line with the Academy's general review criteria for research programmes (see www.aka.fi/en-GB/A/ > Funding & Guidance > Review of applications). Besides these general review criteria, focus will also be placed on the objectives set for the programme, as described in Chapter 2 of this memorandum. This aspect will be considered on the review form under section "Relevance of the project to the research programme".

6. More information

This programme memorandum is available as a PDF download at www.aka.fi/arktiko > in English.

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