

Background paper

# Mistra Arctic Sustainable Development

2012-11-03

**Authors:**

**John Farrell**, Chair, United States Arctic Research Commission

**Kristine Offerdal**, Norwegian Institute for Defence Studies

**Henriette Rasmussen**, Greenlandic Broadcasting Corporation

**Barry Smit**, University of Guelph, Canada

The contents of this background paper are the responsibility of the authors.



# 1. Summary

The goal of the “Mistra Arctic Sustainable Development” Programme is to further advance knowledge of the social, economic and political aspects of sustainable development in the Arctic for the benefit of stakeholders, decision-makers, institutions, and people of the North. Key themes in this programme include implications of environmental change, resource development, transportation, globalization, and geopolitics and security.

This new programme should take advantage of the research capacity established during the preceding initiative titled, “Mistra Arctic Futures in a Global Context,” and should seek to broaden the base of support for continued efforts focused on the North and the higher Arctic.

The programme will require:

- a)** one comprehensive initiative;
- b)** a focus on social, economic, and political issues;
- c)** an interdisciplinary approach that integrates social science and humanities with natural sciences, engineering, and other disciplines;
- d)** demonstrated value to users;
- e)** capacity building in the social science and humanities research communities;
- f)** international cooperation and coordination with research programs and networks;
- g)** communication with a broad cross-section of audiences, including peoples of the North, stakeholders, decision makers, researchers, and the general public.

## 2. Background

The Arctic is taking center stage, both nationally, and internationally, due to rapidly changing conditions. Dramatic shifts in climate, the environment, and increasing resource development, make it essential that important public and private decisions benefit from research, including timely and comprehensive information and a more thorough understanding of this progressively accessible region.

International investment in research and development has risen sharply in recent years, reflecting global interest in the Arctic. Development of oil and gas and mineral deposits, shipping, fishing, tourism, communication, and infrastructure construction are of intense interest to many countries, including Sweden.

While global market forces are certainly a primary factor bringing change to the Arctic, another is the rapidity and degree to which the Arctic environment is changing due to human impacts, and specifically the release of greenhouse gases.

As a result, the Arctic is warming at twice the rate of the global average. Arctic sea ice has dramatically thinned and receded in areal extent. Northern hemisphere glaciers and the Greenland ice sheet are retreating, raising global sea level. Permafrost is thawing, which releases yet more greenhouse gas (methane). In short, the Arctic environment is changing rapidly, and this provides both challenges and opportunities for Sweden.

Sweden also has an important diplomatic role to play in the Arctic region, as it is one of only eight nations in the world with sovereign territory in the Arctic, and because Sweden is a member of the Arctic Council, the prime intergovernmental forum for this region.

Since the Arctic Council first emphasized the need for science for sustainability in the high north, over 15 years ago, the people and the environment in the Arctic have experienced considerable change. There is now an even greater need for an interdisciplinary programme that seeks both fundamental research to improve our ability to evaluate the sustainability of the Arctic human-environmental system and integrated efforts that will provide community-relevant sustainability pathways and engineering solutions.

The “Mistra Arctic Sustainable Development” programme is designed to address key issues in the Arctic that are associated with sustainable development. The programme will approach these issues from a social science and humanities perspective, and will build upon existing knowledge, including that from Mistra’s “Arctic Futures in a Global Context” programme.

---

### Definition of Arctic

There are many meanings to the word “Arctic,” the land of the midnight sun and the polar night. It is challenging to define, and as such, there are several definitions. Some are based on fixed geographical boundaries (66°33’44” North), while others are linked to climatic conditions (e.g., 10°C isotherm) and environmental conditions (e.g., tree line) that may evolve over time. There is even an understanding of “Arctic” among countries with “Northern Regions” that is rooted in cultural identity, regardless of specific latitude and physiographic conditions. For the purposes

of this Mistra program, the Arctic may include any and all of these definitions, in order to promote the broadest comprehension of this region.

---

## Arctic themes

Several themes, on either global or regional scales, are evident in the Arctic, and generate research questions consistent with the scope of this program. Considerations in these themes are the interconnections of past, present and future developments, and the relationship between regional and global developments.

### Implications of environmental change

Arctic climate is changing rapidly, reflecting changes in physical, chemical, and biological systems. Glaciers are melting, global sea level is rising, permafrost is degrading, and sea ice cover is diminishing. These environmental changes have implications for communities, economic activity and politics in the Arctic.

Arctic communities are already experiencing changes in the physical and biological systems on which they depend, and they are must adapt. People who rely on ice for transportation, wildlife harvesting and social interaction are altering their resource practices. Communities and industries based on fishing or forestry are sensitive to changes in ecosystems, with implications for harvesting regimes, business management and government policies and regulations. Coastal communities are experiencing threats to infrastructure from increased erosion, thawing of permafrost, and changes in storm intensity and frequency.

While considerable information exists on the environmental changes, past and future, there is a need to improve and understand the sensitivity of communities and social and economic systems to these changes, including knowledge on adaptive strategies available to sustain development.

### Resource development

Increasing global demands for energy, minerals, protein, and plant products, as well as the means to transport these resources represent major drivers of Arctic change. Developed countries seek additional resources to maintain rates of consumption, while the needs of large, rapidly developing countries are further adding to the need. This demand, combined with an increasingly accessible Arctic, due to climate change and increases in technology, and relatively stable geopolitical conditions, has resulted in increasing exploration, harvesting, and extraction activities.

Resource development activities generate economic opportunities in the Arctic, and they also introduce risks to arctic communities and societies. This trend towards more resource development will continue, requiring knowledge about how to better manage these resources and how various stakeholders interact throughout this process, as well as how development of the region's resources tie in with developments in regional and global energy markets.

### Transportation

Marine transportation is the primary means of bringing resources out of the Arctic, but also in. Reductions in sea ice are extending the seasons for shipping and fishing, and Arctic marine tourism and adventurism is also on the rise. The rate of Arctic maritime activity is increasing rapidly, but is primarily destinational, with regional impacts. Arctic shipping will be challenged by environmental conditions (weather and ice), insufficient infrastructure (ports and harbors, aids to navigation), limited capabilities for search and rescue and oil spill response, lack of international standards and codes, and even by the inadequacy of basic marine maps and charts.

With respect to air transportation, the Arctic's polar route remains a major pathway for international shipment of passengers and goods. Destinal transport, in support of Arctic-based industrial and other activities, is also on the rise. Even heavy-lift floating airships (dirigibles, e.g., Zeppelin) are being considered as an emerging technology for the Arctic, given the remote location, and reduced season for ground transportation, due to climate warming, which limits the use of ice roads.

Research is needed on the impacts of increased transportation on local communities, and on the geopolitical implications of maritime and aeronautical activities, such as legal and political issues with respect to new sea routes and possible choke points.

### **Globalization**

The increasing globalization of economic and social systems is being experienced in Arctic regions. Advance in communication technology (internet, satellite phones) mean that Northern peoples are being exposed to the values and lifestyles of "outsiders."

Communities are dealing with the implications of the pervasive influence of popular culture, which often challenges established norms, traditional values, and indigenous identities and languages. Economic globalization provides both opportunities and constraints on Arctic businesses and communities. While employment opportunities may increase, high levels of unemployment and associated social issues are evident in many Arctic communities. There is a need to better understand the role of globalization forces in the development of societies and economies in Arctic regions.

### **Geopolitics and security**

Rapid changes in the region, and increased human activity naturally lead to geopolitical and security considerations. These may include how states assess and then deploy their assets to address needs, on a unilateral or multilateral basis, such as exercising sovereignty, resource management, law enforcement, and search and rescue. The importance of global regimes (such as the UN Convention on the Law of the Sea), in contributing to Arctic security is another framework topic. In addition to state security, consideration should be given to societal security (e.g., marine safety) and human security (e.g., food supply).

### 3. Programme Description

The goal of the “Mistra Arctic Sustainable Development” programme is to further advance knowledge of the social, economic and political aspects of sustainable development in the Arctic for the benefit of stakeholders, decision-makers, institutions, and people of the North.

Ideally, the new programme will be a comprehensive, integrated, and interdisciplinary initiative to understand the dynamics and inter-relationships underlying the processes of development and change in the Arctic.

The new “Mistra Arctic Sustainable Development” programme should be one, large, integrated, coordinated, interdisciplinary initiative. This contrasts with the prior Arctic initiative, which consisted of five projects beneath one programmatic umbrella.

The specific attributes of the programme:

- ▶ **Structure:** one comprehensive and coordinated initiative. Such an approach will be consistent with the structure and operation of a traditional Mistra programs, implying the identification of a team that includes a program manager, a host institution, and a programme board appointed by Mistra.
- ▶ **Focus:** on social, economic and political aspects of Arctic sustainable development. Themes that could be considered in this context include implications of environmental change, resource development, transportation, globalization, and geopolitics and security.
- ▶ **Interdisciplinary and integrative:** combines social science and humanities with elements of the natural sciences, engineering, and other disciplines as appropriate.
- ▶ **Funding:** should be commensurate with other, traditional Mistra initiatives, particularly in light of the scope and complexity of the anticipated effort.
- ▶ **Value to users:** relevance to people of the North, stakeholders, decision makers and the general public, as demonstrated by their participation in the program, or by other means.
- ▶ **Capacity building:** in social science and humanities research communities. Examples include involving junior scientists, engaging a broader range of expertise, establishing new collaboration and networks.
- ▶ **International cooperation and coordination:** with research programs and networks. One of the opportunities to link with another program is the US National Science Foundation’s international program ArcSEEs, Arctic Science, Engineering and Education for Sustainability).
- ▶ **Communication:** with a broad cross-section of audiences, including peoples of the North, stakeholders, decision makers, researchers, and the general public. Mechanisms to be considered include formal and informal publications, conferences and workshops, social media outlets, traditional media campaigns, and public events, such as “Town Hall Meetings.” The programme has a responsibility to translate the results of the research so that they are useful to the broader society.

## 4. Relevance to Sweden

Sweden's relationship to the increasingly accessible Arctic is multifaceted. Sweden is one of only eight nations with sovereign territory in the Arctic, and Sweden has contributed to and helped lead the Arctic Council, the only governmental forum for the region that involves all eight Arctic nations. The Arctic will become increasingly relevant to Sweden in several specific ways:

**a. Domestic interest.** The North has long been an important source of resources for Sweden, such as timber and ore. How these resources are responsibly managed, and how conservation is balanced by development remain significant issues.

With respect to a green and secure source of domestic energy, the Arctic is of great significance. The vast majority of hydroelectric power plants in Sweden are located on the large rivers above the Arctic Circle. These have been generating electricity for more than 100 years. Sweden is the world's 10th largest producer of hydroelectric power. In 2009, Sweden produced 66 TWh, which approximately equals Sweden's electricity from nuclear power. As the Arctic environment changes, however, due to human-induced climate change, the hydrological cycle will also change, and the impacts of this on the volume and seasonality of riverine flow, and possibly on competing needs for these waters, may pose new challenges for this industry.

The North has always been an important element of Swedish identity and culture. The Sami, the northernmost indigenous people of Europe, are an integral part of Sweden, and there have been efforts to address Sami rights and to help develop their cultural and educational institutions and to promote their culture, language, and traditional trade. For example, reindeer husbandry remains an important aspect of Sami culture in Sweden, and eco-cultural tourism has become an opportunity that is receiving greater attention. In 2010, the Government decided to start an interdisciplinary Sami research programme involving several entities, and Mistra can support such efforts.

**b. International commercial interests.** As a developed country, with global financial considerations and opportunities to pursue, Sweden has obvious and competitive commercial interests in the region. Sweden provides expertise and helps build capacity in Arctic mining technology, maritime activities and energy service industries, and communication and transportation technologies, among others. Swedish participation will be integral, as the region develops.

**c. Locus and means for positive regional engagement.** Participation in Arctic regional issues enables deeper Nordic and European cooperation. As described in the Government's "Strategy for the Arctic Region," "It is in Sweden's interest that new emerging activities are governed by common and robust regulatory frameworks and above all, that they focus on environmental sustainability." An example is Sweden's participation in the "Barents Euro-Arctic Council, a forum for intergovernmental and interregional cooperation in the Barents Region. Sweden chaired this forum from 2009 to 2011. Sweden's participation in European Union activities focused on the Arctic, such as a proposed EU-Arctic Centre, is another such example of regional engagement.





**d. Global citizenship and responsibility.** Through leadership and participation in Arctic-related initiatives in fora, such as the United Nations, the intergovernmental Arctic Council, and the non-governmental International Arctic Science Committee, Sweden has earned a well-earned reputation, as a nation that advances and participates in international activities to promote knowledge and to create new ideas for intellectual as well as practical purposes. As such the Arctic region provides a focal point for proactive engagement with other Arctic and non-Arctic states under many of the topics within the scope of this program, such as the UN Convention on the Law of the Sea Treaty and the Stockholm Convention on Persistent Organic Pollutants. Such engagement builds trust and enhances international collaboration and cooperation, which are hallmarks of civilized society.

As an example, in 2011 Sweden signed an agreement on cooperation on aeronautical and maritime search and rescue in the Arctic, an international treaty concluded among the member states of the Arctic Council Arctic Council's new search and rescue treaty. This treaty, a binding agreement, coordinates international search and rescue coverage and response in the Arctic. In 2013, a second agreement is anticipated, on oil spill response in the Arctic, also coordinated through the Arctic Council.







 The Arctic is taking center stage, both nationally, and internationally, due to rapidly changing conditions. Dramatic shifts in climate, the environment, and increasing resource development, make it essential that important public and private decisions benefit from research, including timely and comprehensive information and a more thorough understanding of this progressively accessible region. Development of oil and gas and mineral deposits, shipping, fishing, tourism, communication, and infrastructure construction are of intense interest to many countries, including Sweden.

---