Belmont Forum Collaborative Research Action
Call for Proposals on Arctic Observing and Research for Sustainability
2014 International Opportunities Fund

1. Introduction

Planning for a sustainable environment, in which human needs are met equitably without harm to the environment, and without sacrificing the ability of future generations to meet their needs requires a robust understanding of the integrated system of society, the natural world, and the alterations humans bring to the environment. Developing this robust understanding of the integrated system is a common interest among Belmont Forum members and is the focus of this Collaborative Research Action Call for proposals. The ultimate goal of the call is to utilize existing Arctic observing systems, datasets and models to evaluate key sustainability challenges and opportunities in the Arctic region, to innovate new sustainability science theory and approaches to these challenges and opportunities, and support decision-making towards a sustainable Arctic environment.

The Belmont Forum is a group of the world's major and emerging funders of global environmental change research and international science councils. It aims to accelerate delivery of the environmental research needed to remove critical barriers to sustainability by aligning and mobilizing international resources. Belmont Forum funding is intended to add value to existing national investments and support international partnership in interdisciplinary and transdiscplinary scientific endeavors.

2. Background

Fundamental to all sustainability research is the simultaneous consideration of social, economic, and environmental systems and the long-term viability of those systems. Sustainability science includes understanding the vulnerability, adaptive capacity, and resilience of coupled human environment systems, multi-scale processes, as well as complex adaptive systems theory, and emergent behavior. In this context, sustainability relies on fundamental research from both the natural and social sciences that improves our ability to evaluate the sustainability of the human-environmental system as well as integrated efforts, which will provide community-relevant sustainability pathways and engineering solutions.

In recent decades, the Arctic has undergone rapid and unbounded change – a dramatic decline in sea ice extent and volume, extensive erosion of entire sections of the more than 200,000 km of Arctic coastline, permafrost thawing, shifting migration patterns of both people and animals, a growing demand for northern oil and development of energy infrastructure and increased interest in seasonally ice-free intercontinental transport routes. The effects of these changes on Arctic communities are as diverse as the communities themselves. Approximately 4 million people, including 400,000 indigenous people, live in the Arctic. The economic and population base of these communities spans a range from small subsistence hunting, fishing, gathering, and herding communities to regional business and government centers to large resource extraction cities.

Environmental and human changes are not unrelated -- a shrinking cryosphere has led to a diminishing sense of fate control amongst northern peoples; these changes are compounded by external, global pressures for natural resource development and territorial access. Stressors, whether natural or human-induced, have elements of potential benefit and also possible harm for the Arctic system and human well-being. These changes contribute directly and interactively to the cumulative effects on the natural systems, infrastructure, and human populations that inhabit the Arctic.

A sustainable Arctic that can cope with the rapidity and severity of current environmental change, increased human activity and commerce will need to be informed by continuously improving scientific knowledge and proven mitigation strategies. While existing Arctic observations and observing networks have provided a basis for assessing the natural environment, there is a need to integrate observations and transdisciplinary research on coupled natural-human systems in the Arctic.

3. Call Objectives and Related Themes

Through this Call, the Belmont Forum seeks to bring together integrated teams of natural scientists, social scientists, and stakeholders to develop projects that utilize existing Arctic observing systems, datasets and models to evaluate key sustainability challenges and opportunities in the Arctic region across one or more of four possible themes. This Collaborative Research Action Call seeks to advance research within one or more of the following themes, utilizing and developing both the relevant information streams and the sustainability science necessary to assess, predict, inform, and communicate resilient pathways:

1-The natural and living environment – focusing on in-depth understanding of the nonlinear physical and biological interactions within the Arctic.

2-The built environment and infrastructures – including but not limited to housing and transportation structures, energy, and communications technologies, climate-resilient materials, and sustainable observing designs.

3-Natural resource management and development– comprising drivers and impacts both in natural and human systems, within the Arctic and interaction with the rest of the world, including food and water security.

4-Governance – addressing the interactions between actors and organizations that govern the future of the Arctic, from local and tribal to international scale, and their impacts on the natural environment.

While these four themes are universal, they are given a particular urgency in the Arctic where environmental changes have created new and immediate challenges, dilemmas, trade-offs, and opportunities. These themes are related to risks and opportunities, associated with changes in the environment and ecosystem services, for the various competing actors, with specificities associated to geographical areas (i.e. coastal, mountain, etc.) or to most vulnerable societies.

Since the Arctic is a highly interdependent system, these themes are not unrelated and projects may address interactions among these themes. Below, without being exhaustive, are some examples:

- Food and water security encompasses not only subsistence activities, but looks at the relationship of conservation, regulation, economic, built infrastructure, socio-cultural, and health factors on access to natural foods and clean water. Migrating animals, such as birds, whales, and rangifers - still a staple of the local diet - relocate to new habitats or suffer reproductive decline as climate change progresses and their food sources and breeding grounds change or disappear, limiting access to traditional foods.

- Natural resources may include traditional and farmed foods, such as fish and caribou, but also encompasses the current and future challenges and opportunities presented by extractive industry and clean energy technologies.
- The growth of transport infrastructure, whether by air, land, or sea constitutes one aspect of the evolving built environment, which also includes research into climate-resilient structures and materials, affordable public utilities including communications, and the response of communities and the natural environment to increased access.
- The policies which regulate food and water, natural resources, and infrastructure are made by decision makers representing varied governing entities, including political, economic, social, and scientific organizations which range from the tribal to the multi-national. Many of these policies are developed by actors residing outside the Arctic, resulting in complex interplay across the Arctic circle.
- Oil and gas extraction in an increasingly ice-free Arctic Ocean presents both opportunity in terms of economic prosperity and challenges in the form of environmental impacts in an area where the baseline and climate-stressed ecosystem states are little known, and effective prevention and response strategies to spills have not yet been developed among the Arctic Nations.
- Permafrost thaw, retreating glaciers, and greening of the Arctic are modifying the terrestrial landscape, which may induce shifts in the ecological cycle of entire biomes, affect subsistence practices, and contribute to the deterioration of communication and transportation systems, housing structures, and food storage methods. On the other hand, these changes may also motivate the engineering of climate-resilient structures and materials and open the possibility for developing natural resources, highly efficient green technologies, adaptable communications solutions, and innovative transport design, while also ensuring that indigenous communities and Arctic residents retain for future generations their culture, language, traditions, and connection to the land.
- Ice and weather conditions, once predictable for hunting and gathering, have become increasingly erratic and the traditional methods for predicting them unreliable. As the ice recedes from the coastline and thaws on the land surface, the terrestrial and marine ecosystems and human infrastructure it protected from wind, waves, and warming are now exposed, as are the natural resources and greenhouse gas reserves contained below the surface.
- Environmental changes can affect overall health and security in an already stressed population. Warming induces release of pollutants once trapped in the ice, snow, permafrost and introduces new disease vectors into the air and local water supplies. The increased occurance of extreme weather events can further destabilize already vulnerable structures and create health emergencies which may exceed the capacity of local government and health care facilities

4. Proposal Requirements

All calls require eligible participants from three or more countries[1.] Clear added value of the international consortium should be demonstrated and, if relevant, the added value for national investments.

[1] See participation requirements and national annex documents for more details.

All proposals must integrate across the natural sciences and social sciences and should include an interdisciplinary, multinational approach, demonstrate strong relevance for user needs, and examine a variety of coupled interactions and feedbacks among relevant systems.

Proposals should also include end-users, policy-makers or other relevant stakeholders and should include science products, which are directly applicable, available and usable to relevant stakeholders. Engagement of community participants or other stakeholders in the planning, design, and completion of the research is necessary.

Proposers should also describe how information generated in the course of the project will be captured, stored and managed. Plans for longer-term archiving of data should be detailed, as should the communication plans to make the scientific and stakeholder communities aware of available data, products, and relevant findings.

5. Funding instruments and requirements

The Belmont Forum seeks to support projects that are based on inter- and trans-disciplinary research involving robust end user community engagement. Recognizing that the international research communities needed to address the challenges of this Call may be in various stages of development, the Belmont Forum will support three complementary types of proposals.

1. **TYPE 1: Small collaboration grants**, available to connect researchers and stakeholders from three or more countries to engage in transdisciplinary collaboration around one or more of the themes. Applicants should consider for their collaboration the development of research proposals for other calls (whether national or international), best practices, shared methodologies, and interdisciplinary scholarship for these themes. It is expected that these research teams would deliver relevant products that would advance understanding of Arctic coupled human-natural systems and Arctic resiliency. The total budget for a TYPE 1 project should not exceed 200,000 Euros and have a maximum duration of 3 years.

2. **TYPE 2: Small synthesis grants**, available to synthesize results from existing or finished research grants, activities, and other national or international projects. Proposers are advised to build their projects in close connection with the funded research projects, other national and international projects and stakeholder groups. The total budget for a TYPE 2 project should not excedd 500,000 Euros and have a maximum duration of 3 years.

3. **TYPE 3: Research grants**, available to address one or more of the themes through the lens of Arctic observing systems and sustainability science. Observations of the changing Arctic system are collected by a range of institutions, including but not limited to local residents, academia, government and industry. Proposers are encouraged to leverage available observing data from various research infrastructures, Arctic observing networks, and scientific theories to study, develop, and advance knowledge on coupled human-natural systems in the Arctic. This can include work on adaptive strategies, resilient design, scenario planning, and policy development. The total budget for a TYPE 3 project should not exceed 1,000,000 Euros and have a maximum duration of 5 years.

6. Scientific follow-up

The projects are required to contribute to the overall Belmont Forum goals by participating in common annual synthesis conference held in a central location back-to-back with a scientifically relevant international conferences or events.

It is expected that arrangements will be made for timely release of information and resources from publicly funded research projects. Proposers are required to describe how the consortium will deal with the dissemination, publication, and, protection of results generated in the project, particularly to stakeholders and the scientific community.

7. Eligibility requirements

Funding should support researchers to cooperate in consortia consisting of partners from at least three of the participating countries.

Researchers from countries not represented by any of the Partner Organizations can participate in the research project at their own expense.

Each consortium must also show clear links to users and include collaboration between natural and social sciences, and other sciences where relevant.

Consortium partners should identify a Leading Principal Investigator (LPI) for each proposal for application, management and communication purposes. The LPI is officially responsible for all communications with the Call Program Office, including the submission Proposal. These communications must be in accordance with the LPI's funding agency requirements.

8. Funding Principles

Private sector participation is strongly encouraged, both as partners and as partial co-funding sources, if the participating national funding agency has suitable instruments. Within each selected consortium, funding of the participating researchers is provided by their respective national funding organization in accordance with their standard award terms and conditions. Evaluation criteria for the projects are based on existing Belmont Forum procedures, with main themes of scientific excellence, balance between societal and natural sciences, stakeholder participation and services and generation of new international co-operation and connections.