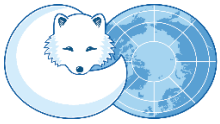

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Enhancing Arctic Resilience in the Arctic Council A Strategy for 2015-2017

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Strategy

Enhancing Arctic Resilience in the Arctic Council
A Strategy for 2015-2017

The Arctic region is experiencing some of the most rapid and profound ecologic and economic changes on the planet. While climate change is the most prominent driver of these changes, many other environmental, social and economic changes are rapidly occurring at the same time. In the face of all of these changes, it is critical to take actions that will reduce such impacts, and increase the ***resilience*** of communities and ecosystems in the Arctic. Resilience is the capacity of a socio-ecological system to cope with disturbance and recover in a way that maintains its core function and identity, while also adapting to changing conditions (Arctic Resilience Report, Interim Report, 2013). The Arctic is a diverse region with many different cultures, practices, and landscapes, so the qualities of successful resilience across the circumpolar Arctic are equally diverse.

A holistic approach to resilience recognizes the close relationship between communities and ecosystems. While community-based approaches focus on empowering local communities to cope with change, ecosystem-based approaches focus on the management of ecosystems to maintain the goods and services they provide for communities and other beneficiaries. These two approaches are highly complementary, especially in the Arctic where communities and ecosystems are very closely intertwined.

Resilience in the Arctic Council

The Arctic Council can play a big role in building the knowledge base on resilience. Arctic States, Permanent Participants, and Observers can cooperate to encourage sound policies at the national and international levels and inform resilience efforts at the sub-national and community levels. Arctic Council Working Groups have already led a number of initiatives to enhance resilience: AMAP conducted assessments, such as the Snow, Water, Ice, Permafrost in the Arctic (SWIPA) assessment and the Arctic Change Assessment (ACA), to increase our understanding of changes in the Arctic; CAFF led the development of the Arctic Biodiversity Assessment (ABA) and follow-on recommendations to enhance ecosystem resilience; and SDWG led several initiatives to improve the health and well-being of Arctic communities, which in turn builds resilience to a wide range of changes. The Arctic Council Ecosystem-Based Management Expert Group, established in the 2011 Nuuk Ministerial Declaration, focused on the need to integrate ecological, economic, and cultural objectives to build socio-ecological resilience, and the Arctic Resilience Report provided an interim assessment of Arctic resilience concepts in 2013.

The 2015 Iqaluit Ministerial Declaration also addressed resilience needs in several ways: It welcomed the implementation plan of the Arctic Biodiversity Assessment and its associated recommendations, including an assessment of potential pathways of Arctic invasive species; it recognized the importance of risk assessments in relation to climate change; it recognized the need to evaluate the widest possible range of impacts and inform decisions; and it recognized the importance, once again, of ecosystem-based management approaches in the Arctic region.

Arctic Council working groups are currently implementing several efforts that can build resilience in the Arctic, and the U.S. chairmanship program will focus on integrating these

efforts to advance the concept of resilience in the work of the Arctic Council. A description of how these efforts will be integrated follows.

A Framework for Resilience in the Arctic Council

The Arctic Council plays a key role in advancing our understanding of resilience and encouraging policies and programs that enhance resilience at the international, national, and subnational levels. The Arctic Council currently implements activities that work towards these objectives: 1) Advancing understanding of resilience through assessments of vulnerabilities, impacts and best practices, 2) Improving monitoring efforts and providing decision-making tools and services, and 3) Developing and encouraging effective actions and policies. Some Arctic Council activities achieve more than one of these objectives.

Advancing Understanding of Resilience through Assessments of Vulnerabilities, Impacts and Best Practices

A number of Arctic Council assessments, such as the Arctic Climate Impact Assessment (ACIA), SWIPA, and the ABA, have advanced our scientific understanding of change in the Arctic region. Activities over the next two years will build on this knowledge and focus on the information necessary to help communities, and the ecosystems upon which they depend, respond to ongoing changes and build resilience.

Continuous reporting and evaluation of adaptation actions will be critical to further building and refining our knowledge base. Two complementary assessments will take place during the current chairmanship and together will form the knowledge foundation for advancing resilience in the Arctic. The **Adaptation Actions for a Changing Arctic (AACA) Part C** report will improve our understanding of climate change, how it interacts with other stressors, and likely impacts in different part of the Arctic. AACA Part C will include three regional assessments (Beaufort/Bering/Chukchi Sea, Baffin Bay/Davis Strait, and Barents Sea) in 2016 and a pan-Arctic assessment, along with a comprehensive set of policy recommendations, by the end of the U.S. chairmanship. The **Arctic Resilience Report (ARR),** initiated under the Swedish Chairmanship (2011-2013), will focus on the underlying resilience of socio-ecological systems in the face of both gradual change and sudden changes known as tipping points. Using stakeholder input and a substantial set of case studies, the ARR will produce a scientific assessment in 2016 and a set of policy recommendations and actions at the conclusion of the U.S. Chairmanship. Senior Arctic Officials (SAOs) have expressed support for the ARR and have emphasized the need for strong coordination between AACA and other assessments (Meeting of Senior Arctic Officials, Final Report, November 2012), so integrating these efforts as much as possible will advance SAO objectives and ensure complementarity of these two important resilience efforts.

In coordination with these two key assessments, Arctic experts will evaluate the state of knowledge about **invasive species** in the region and develop a strategy for prevention and management. The spread of invasive species is expected to increase with climate change, and expanding human activity in the Arctic region will make socio-ecological systems more vulnerable to this spread. Although many areas in the world are already suffering the impacts of

multiple terrestrial, marine and freshwater invasive species, the Arctic has remained relatively untouched. This presents a unique opportunity to prevent invasive species introduction and spread in the region, and minimize their overall damage. This assessment will identify and rank the pathways by which invasive species would likely be introduced into the Arctic, identify specific areas that are highly vulnerable to invasive species, and suggest best practices for their control and eradication when necessary. By understanding the potential impacts of invasive species, we can be proactive and take preventative steps to reduce risk and enhance community and ecosystem resilience.

"**One Health**" is an interdisciplinary approach to assessing health issues at the interface of humans, ecosystems, and animals. During the US Chairmanship, an interdisciplinary group of experts (ecologists, veterinarians, human health experts, etc.), under the leadership of the SDWG, is implementing a number of critical activities throughout the Arctic for building resilience – an approach that is especially relevant in a region with such interconnected social and ecological systems. The group of experts will assess the extent to which the One Health framework has been implemented and institutionalized across the Arctic and identify steps for the next phase of implementation. The following three examples demonstrate current activities in the Arctic that are using a One Health approach and will enhance the resilience of Arctic communities and ecosystems:

- Zoonotic disease: One Health is being used to understand disease in caribou in order to prevent disease in the animals and in subsistence hunting communities by engaging wildlife experts to detect disease in caribou. A preliminary assessment will be applied to evaluate the successes and barriers to using this approach regionally.
- Toxoplasmosis: The One Health approach is being used to investigate the *Toxoplasma gondii* pathogen and its impact on people and wildlife in the circumpolar north. *Toxoplasma gondii* causes toxoplasmosis, a typically asymptomatic condition that can cause serious complications in people with already weakened immune systems. The study has found that the pathogen may survive freezing temperatures in coastal waters and may be a significant source of infection to marine animals in the Arctic such as shellfish and seals – increasing the infection risk for Alaska Natives who practice subsistence hunting. Findings from this study will inform strategies to prevent pathogen transmission to key subsistence resources in the region.
- Tick-borne disease: Climate change is increasing tick ranges and densities of tick populations in the Arctic. Alaska Native communities are thus at high risk to tick-borne diseases due to infestations in their subsistence resources. The One Health approach is being applied to tick-borne diseases that are impacting wild and domestic mammals such as dogs, deer, moose, and wolves. Findings from this study will inform strategies of tick prevention and treatment.

Improving Monitoring Efforts and Providing Decision-Making Tools and Services

It is important to expand monitoring networks that help to aid decision making and to improve future knowledge assessments of impacts, vulnerabilities, and resilience practices. As the resilience knowledge base expands, as described above, it is also important to translate this knowledge into tools that aid decision making and establish the appropriate infrastructure for knowledge exchange and innovation. For example, CAFF, along with other Arctic Council

partners, will produce geospatial risk assessment maps to help decision makers understand the current and projected geographical pathways of invasive species and help assess risk and set priorities for surveillance. Other experts will use the findings of the Arctic Resilience Report and previous work with Permanent Participants to test the usefulness of a set of key community-level resilience indicators.

It is important to note that because the Arctic is vast and sparsely populated, needed data does not always exist. Community observation networks can often fill these monitoring gaps and provide critical information for decision making. The Local Environmental Observer Network (LEO) is an acclaimed model for engaging communities and connecting them with technical experts. LEO is comprised of local experts, currently based in Alaska and Canada, who collect observations about anomalous environmental events in their communities. These experts can share observations in real time while applying local and traditional knowledge to put their observations in context. LEO is an example of how western science and local and traditional knowledge can be used in tandem to improve resilience actions. Over the next two years, the expansion of LEO into a **Circumpolar Local Environmental Observer (CLEO)** Network will begin. During the U.S. chairmanship, a CLEO chapter will be established in North America, with the hope of expanding CLEO to other regions of the Arctic in subsequent chairmanships.

While there is a clear need for a more robust scientific understanding of changes in the Arctic and how best to respond, there is a great deal of data and information that already exists. The **Arctic Adaptation Exchange Portal (AAEP)** (http://arcticadaptationexchange.com/) which was first developed under the Canadian chairmanship (2013-2015), serves as a central online information hub for knowledge, data, case studies, and tools for climate change adaptation. The AAEP brings added value by facilitating the direct exchange of knowledge among three audiences: 1) researchers; 2) decision-makers; and 3) communities. Over the next two years, the AAEP will continue to grow through the improvement of functionality, addition of content, and outreach activities aimed at potential users. By consolidating information in one place, decision-makers and communities in particular will have access to important information to make better decisions.

The sharing of government data and information is a crucial step to building resilience. The U.S. government has conducted an extensive data inventory and released a new Arctic thematic hub for its Climate Data Initiative (www.data.gov/climate/arctic) and Climate Resilience Toolkit (http://toolkit.climate.gov/topics/arctic) websites, which will be connected directly to the AAEP. These websites consolidate U.S. federally-supported data, tools, and best practices that can foster greater resilience to climate change in the Arctic. This public collection of data and resources is also intended to spur innovation and entrepreneurship in the private sector – much the same way US federal LandSat data provides the foundation for Google Earth. Other Arctic Council Member States, Observers, and partners will be encouraged to take similar actions to inventory and share their Arctic data and resources more systematically. This will enhance the knowledge base that is needed to build resilience across national boundaries in the Arctic.

Developing and Encouraging Effective Actions and Policies

The activities described above strive to encourage effective planning and policies that enhance the resilience of communities and ecosystems. Assessments like the AACA part C and the ARR will not only enhance our scientific understanding of resilience, but will lay out clear and concrete policy recommendations at the community, sub-national, national, and international levels. These efforts will also aim to provide recommendations for advancing resilience during future chairmanships of the Arctic Council.

The invasive species assessment will also serve as a basis for a concrete plan for cooperation between the Arctic Council Member States and Observers. This plan will aid international cooperation in the prevention, control, and eradication of invasive species in the Arctic and encourage sound planning and actions at the national level and sustained international cooperation on this issue in subsequent chairmanships.

In addition, as follow-up to the assessment of One Health efforts, a "roadmap checklist" will aim to aid in implementing a regional One Health approach at various levels of governance. One Health "hubs," designed to bring together experts and institutions to collaborate on issues from a One Health lens, will be designated throughout the Arctic.

Looking to the Future

The United States proposes to host a workshop in early 2016 that will explore how all of these resilience initiatives can be integrated in ways that more effectively achieve the resilience objectives of Arctic Council Member States and Permanent Participants. The workshop will also explore priorities related to resilience that the Arctic Council can address in the future. Relevant experts, Member States, Permanent Participants, Observer States and Arctic Council Working Groups will be invited to participate. In preparation for this workshop, Member States and Permanent Participants are invited to identify their top concerns and priorities for enhancing resilience.

Building resilience in the Arctic is a critical need. With all of the ongoing changes in the Arctic, some of them gradual and others quite sudden, Arctic communities and systems need to be equipped to handle multiple stressors. By continuously improving our knowledge base about resilience, providing tools and resources for decision making, and disseminating tested frameworks and policy recommendations, the Arctic Council can play a crucial role in enhancing the resilience of Arctic communities and ecosystems. Arctic Council activities and processes over the next few years will better position the Arctic Council and the countries and communities that it represents to respond to changes in the long-term.

Appendix
Arctic Resilience Priority (2015-2017): Project Information

1. **Advancing Assessments that Address Resilience (i.e., AACA and ARR)**
   The Arctic Resilience Report (ARR) and the Adaptation Actions for a Changing Arctic (AACA) Part C assessment are currently under development. The assessments have many potential synergies, and the project teams are working to enhance coordination of key findings and messaging. The AACA Part C includes three regional assessments that will be completed in 2016, and a full ARR Scientific Report will also be completed in 2016. A set of "key messages" from the assessments could potentially be delivered in 2017. Both assessments will provide important insights about the resilience of Arctic communities and ecosystems to climate change, and they are expected to form a more robust knowledge foundation about changes in the region and strategies to deal with those changes.
   Working Group: AMAP
   Related Websites:
   http://www.arctic-council.org/arr/
   http://www.amap.no/adaptation-actions-for-a-changing-arctic-part-c

2. **Arctic Adaptation Exchange Portal: Facilitating Adaptation to Climate Change**
   The U.S. chairmanship will build on the Arctic Adaptation Exchange Portal (http://arcticadaptationexchange.com/) which was launched in April 2015. The University of Alaska, Fairbanks will maintain the Portal in 2017. The Portal makes climate-relevant data and information more accessible for Arctic communities, decision makers, and researchers. The Portal also provides a space for users to share lessons learned about adaptation. Project leads will increase awareness about the Portal, improve its functionality, and ensure that additional content is added. Arctic Council Member States have made commitments to submit relevant national-level data and tools for inclusion in the Portal.
   Working Group: SDWG
   Related Websites:
   http://arcticadaptationexchange.com/

3. **Circumpolar Local Environmental Observer (CLEO) Network for Traditional Environmental Knowledge**
   The Local Environmental Observer (LEO) Network is a network of local experts that collect observations of unusual environmental events in their communities. They submit their observations via technology, and these observations are posted to public, web-based Google maps. Observers can apply local and traditional knowledge, western science, and technology to provide context to the observations. The LEO Network currently operates in several communities in the U.S. and Canada. In 2015-2017, steps will be taken to expand LEO into a Circumpolar Local Environmental Observer (CLEO) network, by first establishing a formal North American "chapter" of the network. The observations garnered through CLEO can bolster our knowledge about climate change impacts and

other environmental trends in the Arctic. It also allows for earlier response efforts to emerging environmental events through monitoring at the local level.
Working Group: ACAP
Related Websites:
https://www.anthc.org/chs/ces/climate/leo/

4. **Operationalizing One Health in the Arctic**
   One Health is an interdisciplinary, participatory approach to assessing health issues at the interface between humans, animals, and ecosystems. This project will involve a number of workshops and consultation opportunities to assess the state of implementing the One Health approach in the Arctic. A circumpolar checklist will be developed to measure progress towards the operationalization of One Health, and a needs assessment, based on the results of consultations and the checklist, will be launched to identify priorities and barriers to implementation. Finally, in 2017, One Health "hubs", i.e., networks of existing institutions will be designated throughout the Arctic to further collaborate and institutionalize the One Health approach.
   Working Group: SDWG

5. **Arctic Invasive Species**
   The U.S. and Norway are leading a CAFF initiative to identify best practices and policies to prevent the introduction of invasive species in marine, coastal, freshwater, and terrestrial ecosystems, and strengthen management of on-going invasions using risk based assessment and management. This project will involve identifying pathways that could introduce invasive species, prioritizing these pathways, and taking inventory of policies and practices across the Arctic to manage and prevent invasive species. This project builds on a set of recommendations resulting from the Arctic Biodiversity Assessment.
   Working Group: CAFF