Arctic Council SAO plenary meeting (eDocs code: ACSAOUS203)
5-6 October 2016, Portland, Maine, U.S.A.

Document Title
Arctic Resilience Final Report Executive Summary

Agenda item number
InfoDoc 4

Submitted by
ARAF Chair

Document filename
EDOCS-3823-v1A-
ACSAOUS203_Portland_2016_InfoDoc4_ARA_Final_Report_
Executive_Summary.PDF

Number of pages, not including this cover sheet
6

Type (e.g. report, progress report, etc.)
Executive Summary
Introduction

Change – even rapid change – is the norm in the Arctic. But today, environmental, ecological, and social changes are happening faster than ever, and accelerating. They are also more extreme, well beyond what has been seen before. And while some changes, such as warming temperatures, are gradual, others, such as the collapse of ice sheets, have the potential to be not only abrupt, but also irreversible. This means the integrity of Arctic ecosystems is increasingly challenged, with major implications for Arctic communities and for the world as a whole.

The main driver of these changes is human activity, largely outside the Arctic. Climate change caused by greenhouse gas emissions plays a particularly large role, but migration, resource extraction, tourism, and shifting political relationships are also reshaping the Arctic in significant ways. Within the Arctic region, population growth and movement, communication, and shifts in culture and self-government are changing how people live and the livelihoods available to them. Understanding how these changes interact with one another, and what they mean for people and ecosystems alike, requires a holistic approach that looks at human and natural dynamics together.

This report uses the concepts of resilience and social-ecological systems to provide a holistic view of the Arctic. A social-ecological system is the combination of the human and natural systems in any given place: for example, the Skolt Sámi communities in Finland, and the ecosystem that sustains them, including the salmon in the Näätämö River. Resilience, as we define it in this report, is the capacity to buffer and adapt to stress and shocks, and thus navigate and even shape change. Interest in the concept of resilience has grown dramatically in recent years, and it is featured prominently in the Paris Agreement on climate change, the United Nations’ Sustainable Development Goals, and the Sendai Framework for Disaster Risk Reduction, among others. Given the large and rapid changes occurring in the Arctic, resilience is immensely relevant to the people of the Arctic, its ecosystems, and the management and governance of the region’s natural resources. The approach taken in this report builds upon decades of research on social-ecological resilience, and a growing body of knowledge on the Arctic in particular.

This report is the concluding scientific product of the Arctic Resilience Assessment, a project launched by the Swedish Chairmanship of the Arctic Council. The project’s 2013 Interim Report provided the conceptual foundations for this final report, as well as a detailed survey of resilience research in the Arctic to date. This Final Report extends that effort by providing a novel assessment of Arctic change and resilience, including factors that appear to support or weaken resilience. It provides an overview of tools and strategies that can be used to assess and build resilience in the Arctic, and considers how the Arctic Council can contribute to those efforts. We hope the insights presented here will help Arctic nations to better understand the changes taking place in the region, and contribute to strengthening Arctic people’s capacity to navigate the rapid, turbulent and often unexpected changes they face in the 21st century.

Part I: One Arctic, multiple visions, shared responsibility

The fact that the Arctic is changing fast is well known: The extent of sea ice, the condition of the Greenland ice sheet, the unusually warm temperatures are all widely
reported – as are the new shipping routes opening up, and the oil exploration efforts. Less prominent, but also reported, are the stories of Indigenous Peoples whose livelihoods are disappearing, or whose villages are becoming uninhabitable.

Yet almost always, the stories (and the studies, policies, and government actions behind them) touch upon just one aspect of Arctic change at a time, missing the big picture. The reality is that changes across the Arctic are closely interconnected. The drivers of change – many of them external to the Arctic – cascade across geophysical, ecological and human elements of social-ecological systems. Because people rarely look at the system as a whole, with all its regional and global connections, we do not fully understand the changes taking place, or what to do about them.

The complexity of the Arctic also makes it challenging to monitor and forecast change – even more so because of the vastness, variety, low population density, and extreme conditions of the Arctic. There are other challenges as well that are equally important: First of all, knowledge that has been developed about the region is often compartmentalized within disciplinary or sectoral boundaries. Indigenous Knowledge, which is crucial to the resilience of many local communities, is often not considered together with scientific knowledge. Although important strides are being made to transcend these divisions, they continue to manifest themselves in much of the discussion of the Arctic, as well as in the organizational structures through which new knowledge is pursued and solutions are developed.

We use the concept of social-ecological systems as a framework for integrating the diverse types of knowledge needed to understand the interactions taking place in the Arctic, and for better understanding how social and ecological systems evolve in concert with one another. Such a framework helps identify common drivers of change, interactions among different processes, and gaps in response strategies, and thus develop more effective approaches to building resilience in the Arctic.

A key aspect of this approach is that it sees people as a fundamental – and increasingly influential – part of nature. It emphasizes the unique human capacity for agency – for engaging in deliberate action. While we all understand this at some level, our scientific methods often seek to screen out human action and the ways in which it is steered. It is this capacity that not only is accelerating the changes taking place in the Arctic, but also provides the means for purposefully and effectively navigating that change. The challenge in the Arctic is that it requires collective deliberation, decision-making and action by a very wide range of actors, within and outside the Arctic.

The theme of the US Arctic Council Chairmanship, “One Arctic, Shared Responsibility”, highlights that important reality: The Arctic is a unique, ecologically and economically crucial region for which responsibility must be shared. It is home to many, a source of resources for others, and a key part of a global system of climate regulation. Yet, while there is only one Arctic, diverse Arctic actors define their interests and goals related to the Arctic in very different ways. The Arctic can be perceived through lenses that emphasize security, tourism, extractive industries, nature, or the well-being of Indigenous Peoples. These distinctions are more than matters of philosophy or perception; they have material consequences. Oil and gas extraction may directly conflict with commercial fisheries, and both may be at odds with the subsistence livelihoods of a local community. The clear demarcation of property lines may favour new development, but hinder the seasonal movements of reindeer herders.

If there is only one Arctic, all parties must share responsibility because activities pursued in one place influence what is possible elsewhere. The Arctic can accommodate very diverse pursuits, but only to the extent that they are either compatible, or else separated by enough time and distance. Some activities may conflict at first, but be reconciled if both sides agree on shared goals and mutually acceptable conditions. A key first step in achieving this is to build a common understanding of the ways in which the diverse aspects of the Arctic – social, ecological and biophysical – are intertwined and co-evolve.

Part II: How is the Arctic changing, what forces are driving change, and how are communities responding?

Arctic ecosystems are changing in dramatic ways: ice is melting, sea levels are rising, coastal areas are eroding, permafrost is thawing, and landscapes are changing as the ranges of species shift. People’s lives are changing as well, with new livelihoods, new technologies, increasing connections to the outside world, and new forms of Arctic governance. Resilience enables people and ecosystems to cope with the shocks and stresses associated with these changes, and to adapt and even transform themselves as needed. Yet some changes are so substantial (and, often, abrupt) that they fundamentally alter the functioning of the system: an ecological “tipping point” has been crossed. Scientists call such changes “regime shifts”.

Arctic Resilience Final Report Executive Summary
Chapter 3 of the report examines 19 documented or potential regime shifts in the Arctic – from a shift to sea-ice-free summers, to collapse of the thermohaline circulation (the global movement of ocean water from the surface to the deep ocean), to collapse of different Arctic fisheries, to the transformation of landscapes: from bogs to peatlands, or from tundra to boreal forest or to steppe. These regime shifts are having large impacts on the availability of wildlife, the stability of the climate, and Arctic people’s sense of place and well-being. They affect many ecosystem services that are important to people within and outside the Arctic: from regulating the climate, to providing sustenance (e.g. through fishing).

Our analysis shows that these regime shifts are driven by a variety of forces, most notably human-induced climate change, but also resource exploitation, fishing and tourism, among others. Drivers of change frequently originate from outside the Arctic – for example, the burning of fossil fuels, and decisions related to fishing and mineral exploitation. Others are the result of Arctic people’s own actions.

Our analysis shows that the risk of most Arctic regime shifts is increasing, but the risk of particular regime shifts varies among Arctic nations. While some regime shifts are well known, such as loss of summer sea ice, most regimes shifts are neither widely known nor well understood; far more research is needed. Another key finding is that climate change is an important driver in all the regime shifts. This means that reducing the risk of regime shifts will require strong action to mitigate climate change, not just by the Arctic countries, but by the global community. At the same time, the analysis points to several potential actions within local or national governments’ control that can decrease the risk of regime shifts. Considering the risk of regime shifts when designing natural resource management systems, policies and plans could increase resilience.

Many regime shifts involve similar processes, which means that there is potential for some regime shifts to trigger or increase the risk of other regime shifts occurring. We know that such “cascading” regime shifts can
occur, but need to learn more about the extent to which different regime shifts reinforce changes that are under way, or how to mitigate this risk. We also know that the consequences of some of these shifts are likely to be surprising and disruptive – particularly when multiple shifts occur at once. By altering existing patterns of evaporation, heat transfer and winds, the impacts of Arctic regime shifts are likely to be transmitted to neighbouring regions such as Europe, and impact the entire globe through physical, ecological and social connections.

Chapter 4 complements this analysis with a review of 25 case studies of how Arctic communities have responded to change: whether they have demonstrated resilience and adapted or achieved transformational change, or lost resilience. Resilience has always been crucial for people living in the Arctic – and it is even more so amid the rapid changes taking place today. The case study analysis helps us to understand the social, behavioural and ecological processes that are already building (or eroding) resilience in the Arctic.

A systematic comparison of the cases identified four key factors that contribute to resilience: 1) the capacity for self-organization – that is, to make decisions and implement responses to change; 2) diversity of responses to change; 3) the ability to learn from and integrate diverse types of knowledge; and 4) capacity to navigate surprise and uncertainty. These findings align with previous research on resilience.

The capacity for self-organization is particularly crucial. A resilient community has the ability to come together to effectively identify and respond to challenges, and can resolve conflicts and disagreements. Our analysis showed a decline in the capacity for self-organization was strongly associated with a loss of resilience. Capacities linked to learning, the maintenance of social memory, and learning from crisis were also very important for enhancing resilience.

Some cases provided examples of how people and communities in the Arctic have transformed the way they live and interact with nature and natural resources. For example, the Inuit of Cape Dorset, in Nunavut, Canada, formerly nomadic hunters, have become internationally recognized artists. The fishing community of Húsavík, formerly nomadic hunters, have become internationally recognized artists. The community's social memory was strengthened by its involvement in the fishing industry. For example, the community developed a strong sense of identity and culture, and its members were able to leverage this sense of identity to attract tourists.

Part III: Shaping change

As noted above, the human capacity for deliberate action (i.e. agency) is central to the humans-in-nature perspective of this report. In the Arctic, as elsewhere, people take action as individuals, as communities, and through various organizations. Institutions play a key role in bringing people together to make decisions and to steer their activities. They help define common policy problems, assemble the required knowledge, create rules and norms to guide responses, and facilitate action.

As the Arctic's sole circumpolar high-level policy forum, the Arctic Council plays an increasingly important role in issues that have major social and environmental implications. Over its brief history it has played a central role in identifying issues of common concern in the Arctic and developing the knowledge necessary to tackle those issues. It has helped devise novel ways of fostering pan-Arctic collaboration, and bridged and brokered between different levels of decision-making. As the Arctic changes, the Arctic Council continues to evolve to meet the region's needs.

To better understand what engagement with the challenges ahead might look like, Chapter 5 reviews the evolution of shared decision-making in the Arctic, with a particular focus on the Arctic Council's 20-year history. In Chapter 6 we analyse how the Council has grappled with three global drivers of change that are especially important in the Arctic: transboundary pollution (i.e. across national borders), climate change, and demand for natural resources and its link to extractive industries. The substance and scale of these issues pose very different challenges for the Council, and offer different opportunities.

Amid constant change, the Arctic Council has been able to deal with new challenges by modifying how it works: incorporating new types and forms of knowledge and opening up to new kinds of participation. It has also set new activities in motion – especially when policy problems cannot be managed within national borders. Going forward, it will be important for the Council to continue to be agile and able to evolve with changing needs.

Finding ways to strengthen connections across issues, both in research and in policy, is a key challenge for the Arctic Council and its activities. Studies and debates too often occur within “silos”: focusing on pollution, or culture, or resource extraction, but less on the interconnections between these activities. By more systematically bringing these different perspectives together, the Arctic Council can support the development of more integrated – and more effective – strategies to address trade-offs and, where possible, find synergies. As with other endeavours,
the development of knowledge depends on the organizational structure that is in place. A more integrated approach to Arctic research and decision-making will require institutional changes to bring together diverse perspectives and forms of knowledge.

Achieving such an integrated approach will likely require building local people’s capacity to engage with a multitude of relevant regional and global processes. It will also require navigating the often-complex allocation of decision-making power among different key actors – no small task in an increasingly dynamic and congested geopolitical context. Another aspect of this effort is to find new ways to connect decision-making activities at the local and international levels.

Organizational learning is a fundamental element of the social response to social-ecological change and thus to resilience. Organizational learning at the level of the Arctic Council has been and will continue to be important as the political landscape evolves and as new knowledge challenges emerge. Arctic decision-making and management systems are currently challenged to respond to rapid change in the region by developing capacities to facilitate the speed and effectiveness of both learning and translating into action.

The basis for decision-making structures and management strategies focusing on the Arctic plays a central role in shaping how Arctic people can influence and are influenced by internal and external changes in climate, ecosystems, politics or economics. As a process of shared deliberation and decision-making, such structures and strategies play a central part in shaping continuity and change by defining goals, who and which knowledge gets considered in decisions, and who owns and has access to Arctic land, seas and resources.

Part IV: Building resilience

Resilience can be cultivated and strengthened. If we understand the key components of resilience, and the extent to which they are present in a given context, we can target activities to enhance each component and fill any gaps. One way to think of these components is as forms of capital; the Interim Report identifies seven types as crucial to resilience: natural capital, social capital, human capital, infrastructure, financial capital, knowledge assets and cultural capital.

These elements are interlinked and should be viewed as “bundles” of resources that complement one another, in different combinations, depending on the context. For example, a community looking to adapt to change by developing tourism might draw on natural capital (wildlife, the beautiful landscape), cultural capital (Indigenous People’s culture and art), financial capital (money for renovations and new amenities), infrastructure (e.g. roads, a port), and social capital (connections within the community and with outsiders who can help attract tourists).

Efforts to measure and monitor these components of resilience in the Arctic are only in their early stages. Our research highlights the need to develop indicators that could be used to monitor and assess the status of different aspects of adaptive and transformative capacity and how they are developing over time. Such a system could be used for evaluating different policy options and how their outcomes influence resilience.

Yet while the bundles of resources are important preconditions for successful adaptation, they are not enough. Adaptive capacity needs to be activated, and in the Arctic context, significant barriers often arise. Two key factors for activating adaptive capacity are enabling institutions and a social and environmental space that allows for flexibility. For instance, reindeer herders have traditionally used migration as a way to cope with unfavourable grazing conditions in any one place; as government policies and industrial development restrict their mobility, they have less capacity to adapt.

A number of Arctic Council initiatives have already contributed to building resilience and adaptive capacity in the region. It has played a crucial role in building knowledge assets, particularly with regard to the Arctic’s natural capital, and in shaping policies on natural resources. For example, the Arctic Climate Impact Assessment helped set the stage for action by providing an in-depth review of the implications of climate change for Arctic people, and by including local and Indigenous Knowledge. The Arctic Council has also helped to build social capital, by providing a forum for international political cooperation, and by enabling new knowledge networks in connection with producing scientific assessments. It has also played some role in building human capital, indirectly supporting education in the Arctic by building knowledge assets that have served as the basis for new educational activities.

The Arctic Council has taken initiatives to strengthen infrastructure for search and rescue and oil spills, but more remains to be done in addressing this key aspect of adaptive and transformative capacity. Similarly, there is a crucial need for support of research to understand how Arctic economies are changing, and how the formal economy and the availability of financial capital affect both households’ incomes and well-being, and communities’ capacity for adaptation.

The final chapter of the report focuses on how to translate the concept of resilience into action in the Arctic. A key starting point is to understand what we mean by resilience: the concept means different things in...
different contexts, and can be laden with judgements about whether systems are fragile or strong, and whether change is desirable or not. In practice, the best way to think about resilience is to think of navigating change as a complex process of identifying the desirable features of a system and strengthening them, while letting other features become weaker to allow for transformational change.

We identify six basic “rules of thumb” – heuristics – for evaluating activities, programmes, practices and/or strategies in terms of their likely contribution to support resilience-building. They are: 1) Are the goals clear? 2) Are multiple kinds of knowledge being integrated? 3) Are place-based community partnerships being supported? 4) Are linkages being made across scales? 5) Is social learning being facilitated? 6) Is culture being taken into account?

We also identify several practices and strategies that can be used to build resilience in the Arctic. The first is to monitor the status of social-ecological systems and how they are changing. Closely related to this are two other practices: tracking and learning from regime shifts, and undertaking resilience assessments. Model simulations – particularly agent-based models, which incorporate the motivations of different actor types – can help decision-makers to understand the implications of different policy options. Participatory scenario analysis is another valuable tool that can provide a platform for addressing and bridging different approaches to knowledge, world views, and values. “Decision theatres” – large, shared visual spaces for exploring an issue collaboratively – are a promising new option. Developing regional and global strategies to build resilience is a valuable approach as well.

Resilience practices are most effective when they avoid panaceas or one-size-fits-all solutions, as these almost always undermine rather than enhance resilience. Instead, there is a need for experimentation and innovation to benefit from insight of theory as applied with the conditions of specific contexts. Resilience-building needs to be a multi-scale enterprise, sensitive to power imbalances, issues of justice (and injustice), and local-level needs. Bottom-up and top-down approaches are needed, and should both have good communication flows, well-articulated and coordinated actions, and high responsiveness.

Institutions will play a key role in building resilience in the Arctic. Informal institutions, such as communities of practice, shadow networks, and boundary organizations can be powerful forces of change when there are no formal arrangements to address a problem. Formal institutions such as the Arctic Council are crucial as well, as they can help establish and support resilience-building programmes.

The Arctic is undergoing rapid and dramatic changes. Building resilience is an urgent, immediate need across the region. While the challenges of Arctic change are great, the people of the North have a long history of resilience and adaptive capacity, but they cannot do it alone. The resilience of Arctic communities and ecosystems depends not only on the commitment and imagination of Arctic people, but on the support provided by Arctic countries’ governments and other partners. Most of all, we need to empower the people of the Arctic to organize, define challenges in their own terms, and find their own solutions, knowing that they will have the flexibility and external support to implement their plans.