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Slide 2

It is not a surprise to anyone in this room that the Arctic is undergoing rapid social, economic and ecological change. While some changes are gradual and continued existing trends, the interactions among the different driving forces may lead to consequences difficult to foresee. This includes dramatic reorganizations of social-ecological systems with substantial impact on human well-being. Such changes can affect the available livelihoods of people, the economic viability of communities and development of entire regions.

Slide 3

Some shifts may be irreversible even if its causes are removed or weakened. These reorganizations pose a special challenge because they might not be detected until it is too late to intervene.

Resilience is about the ability to cope with shocks and at the same time preserve its main functions.

Slide 4

One way of illustrating resilience is to think of a ball in a basin. In a resilient system, there are forces that push the ball back to the bottom even if some forces may want to push it up one side. The opposite situation is when the slightest little push can get the ball falling outside the basin.

One example of a resilient Arctic system is Yamal-Nenets in the West Siberian Russia. The area has a combination of gas fields and tundra landscape seasonally exploited by herders, hunters, fishers and reindeer. Research has shown that, despite the fragmentation and transformation of the environment, socio-economic upheaval and climate warming, the Yamal-Nenets system is highly resilient - able to reorganize in response to shocks. Crucial to its success has been the unfettered movement of people and animals in space and time. It allows them to avoid or exploit a wide range of habitats. But if infrastructure is expanded further, degradation of terrestrial and freshwater ecosystems will increase, together with climate change and large migration, its resilience would be threatened.

Slide 5

Preparing for change should therefore be a priority. We need to identify risks for shocks and potential large shifts in the Arctic, with a focus on ecosystem services that affect human well-being. Usually more than one driver of change is at play and we need to understand their interactions. For some drivers, there may be an appropriate policy response to ease the pressure. It is equally important to understand how to adapt to unavoidable change and, if need be, find policies that support a transition to something new.

Slide 6

A resilience assessment starts by asking "Resilience **of** what?" and "Resilience **to** what?". Then it assesses the risk that the system will reorganize so that it no longer functions normally, passing a so-called threshold or tipping point. After that the potential for adaptation to current stresses or needs in a new transformed regime, without losing its core values, will be analyzed. The final step is to look at policy options. Key words in this exercise are persistency, adaptability and transformability. The following slides provide a simple example of resilience analysis of food security.

Slide 7

The first step is to define the system we want to assess. Here a few examples of food security based on what we want to keep in the face of changes. At this stage it is necessary to define the scale in focus - is it local, regional, pan-arctic or global?

Slide 8

The second step is to identify trends and stressors acting in the system. This part would likely rely on previous and on-going assessments on Arctic change. It may also lead to identifying trends that we know too little about.

Slide 9

This is the core of resilience. It aims to identify potential tipping points and points of no return in Arctic change. Some of them may be irreversible. Here, a few examples of potential tipping points relevant for food security.

Slide 10

That there is a potential tipping point does not necessarily lead to a transformation of the system. Both in natural systems and in societies there are many sources of resilience that will help preserve important values. Emergency organizations and customs would kick in when there is a food threat. Practices are shared, government agencies take action and norms to help others in need will play out. The assessment needs to identify how such sources of resilience can be strengthened. But sometimes it may be necessary to find a new system, identify new sources of food that have the same functions. In such cases it becomes important to understand the general capacity of a society to transform and to find new ways.

One known example relates to drinking water - a municipality had major problems with a parasite in the water supply. It made people sick and forced everyone to boil their water. A transformative

response is to change the technical systems for cleaning the water so that it can deal with parasites. Even such a relatively simple response require investments, expert knowledge and a general level of education.

Slide 11

The final step is to look at policy options to increase society's resilience or its capacity to transform. The assessment can help identify priorities and options for decision makers.

Slide 12

The Arctic Resilience Report (ARR) is part of the wider Arctic Change Assessment (ACA). Scoping workshops of both projects highlighted the close links, the need to avoid duplication and to promote synergies. The ACA promotes the integration, synthesis and assessment of the multiple factors related to ongoing change in the Arctic. The ARR, on the other hand, aims to understand Arctic change by identifying potential shocks and large shifts in ecosystem's services and also to analyze how that might affect societies.

ARR is also closely linked to the work of the Eco-system based management expert group (EBM). It can support on-going efforts

to develop ecosystem-based management in the Arctic by providing scientifically based scenarios of possible futures.

In essence, ARR can be seen as a supporting activity providing input to both processes.

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For details on the time plan see work plan in the proposal.

The ARR will have a project steering committee with representatives from Working Groups and collaborating organizations. An Assessment Integration Team will consist of experts and scientific leaders of all case studies. I am happy to be able to introduce the key players of the Arctic Resilience Team who are in Luleå today. They will be in a much better position to answer any follow-up questions that you might have:

- Jeanette Krantz of the Ministry of Environment of Sweden.
- Johan Rockström, Executive Director of Stockholm Resilience Center and Executive director of the Stockholm Environment Institute.
- Annika Nilsson, Senior Research Fellow at the SEI.

To sum up, Sweden is convinced that an ARR will be of extreme importance for the livelihood of future Arctic generations. It is an

opportunity for the Arctic Council to have a real impact in the understanding of Arctic social-ecological systems that should not be missed.

Thank you for your attention.