

Adapting to Arctic change

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The Arctic is changing two to four times faster than more southern latitudes. Which challenges and opportunities does that give? A new assessment, AACA, is looking for the answer. Credit: NASA

Arctic climate change is real and happening faster than expected. Impacts will likely be large over the next 20 years and society needs to adapt. Climate researchers around the world are now engaged to help stakeholders understand and cope with the challenge. The melting of the sea ice, the spreading of Persistent Organic Pollutants (POPs), and changing sea bird distributions are examples of the changing Arctic environment. Adapting to climate change in the Arctic requires understanding how climate change interacts with other environmental and socio-economic drivers.

Integrates climate knowledge

Traditional assessments of climate, environmental and socio-economic issues in the Arctic have focused on single pressures: climate, acidification, [persistent organic pollutants](#), human health, oil and gas, to name just a few. These assessments have provided valuable information, but there is currently little understanding on how these drivers of change may interact.

The Arctic Council, under the lead of the Arctic Monitoring and Assessment Programme (AMAP), has begun a new assessment to enable more informed, timely and responsive decision making in a rapidly changing Arctic. Adaptation Actions for a Changing Arctic (AACA) will be presented at the Arctic Council Ministerial Meeting in the USA in 2017.

"The Arctic is changing two to four times faster than more southern latitudes. The causes are multiple feedback processes such as loss of snow, sea ice and permafrost. Researchers in the past have tracked previous changes, and we need to continue tracking in order to understand the speed of these interacting changes", says James Overland, Professor at the Department of Atmospheric Sciences, University of Washington, and one of the authors of the assessment.

Helps decision makers

"Assessments in the past have been scientific documents that began and ended with the science itself. AACA serves as a bridge between science and policy making. It helps to better link the current science and related understanding to the decision makers", says Thomas Armstrong, Executive Director with the U.S. Global Change Research Program in the Office of Science and Technology Policy, Executive Office of the

President, and AMAP Head of Delegation.

"AACA synthesizes scientific information of the Arctic and makes it accessible for all. It also will ensure that the science is relevant to decision-making by placing the science information into it a "so what?" context. The assessment points to what the effects of [climate change](#) are on people and on nature today and, through the backdrop of scenarios, it can begin to project what the impacts of tomorrow and beyond may be as well", says Armstrong.

Arctic climate scientists from around the world are now making a scientific report which will lay the basis for designing and implementing adaptation actions. A laymen report will make the knowledge accessible to a broad range of stakeholders, informing them about [climate change impacts](#) across scales and over time.

"We want to talk to people at the very local level where impacts and effects are felt directly all the way up to the national and international policy levels in order to better understand how climate change affects people, land and water across geopolitical boundaries. Climate change knows no boundaries. It affects people at the global scale all the way to the local scale", says Armstrong.

Breaks new ground

Climate, environmental, and socio-economic drivers may interact and amplify, making decision making in a rapidly changing Arctic particularly difficult and uncertain. Changes may increase existing pressures in the Arctic, while others may bring new opportunities. We already see both, with increased pressure on the environment and existing livelihoods occurring in parallel to a new focus on Arctic resources and shipping routes.

The new AMAP assessment will cover three pilot regions: 1) Barents Region, 2) Baffin Bay and Davis Strait Region, and 3) Bering, Beaufort, and Chukchi Region. All three regions will cover both marine and terrestrial areas, and will be forward looking with a focus on 2030 and 2080. The findings of these three pilot regions will lead to an overall integrated report for the 2017 Arctic Council Ministerial Meeting.

"AACA will break new ground by integrating knowledge from many different fields of expertise, and across regions with large cultural diversity, multiple uses and users of local resources, and ambitious development plans for the future. It is an ambitious project. But developing a comprehensive knowledge base on how the drivers of the rapidly changing Arctic interact, gives decision makers the resources they need to respond to the challenges, and prudently take advantage of opportunities", says Glen Peters, co-chair of the assessment and a researcher at CICERO Center for International Climate and Environmental Research - Oslo.

Zooming in

The Intergovernmental Panel on Climate Change (IPCC) assesses climate change at the global scale. With the new Working Group II report in its Fifth Assessment Report it has started to dive into a more detailed level looking at regions like North America and the Polar regions, but still with a low level of resolution. What AMAP aims to do with AACA is to focus from the general scale of the Arctic into the previously mentioned three specific regions of the Arctic.

"We're trying to connect what people are seeing across the Arctic on a regional level. The assessment does not go down to the local level yet, but on a regional level it will hopefully provide a richer level of information than ever before and getting closer to where decisions are being made. The decision makers will see a level of detail and specificity

in say Alaska or Northern Finland that will be significant for climate change policy making down the road. AACA is definitely going to be more relevant to immediate decision making than we have seen up until now", says Thomas Armstrong.

The final reports are not only relevant for Arctic stakeholders. The Arctic climate has a global footprint, and many countries have a keen interest in future Arctic development.

"Extra solar energy is being added to the Arctic Ocean in newly sea ice free regions; this energy is being transferred to the atmosphere and changing local wind patterns. There is evidence that this increasing energy source may also impact the larger jet stream which enhances severe weather in mid-latitudes. Also less [sea ice](#) increases the possibility of economic advances, such as shorter sea routes and resource extraction", says James Overland. "Arctic resources have created global interest, and decisions made in the Arctic will have global implications", says Glen Peters.

Provided by Center for International Climate and Environmental Research

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