CAVIAR

Community Adaptation and Vulnerability in the Arctic Regions

CAVIAR is an International Polar Year project and a pan-Arctic consortium led by Grete K. Hovelsrud, CICERO Norway and Barry Smit, University of Guelph, Canada. Locally-based research takes place in all eight Arctic nations. The aim of CAVIAR is to understand how projected changes in climate interact with social and environmental changes in shaping adaptation and vulnerability to climate change. The research embraces the historical context of change, local involvement in research design, local and traditional knowledge, and case studies across societal levels.

Kikiak

Water reservoir. Photo: Christina Goldhar

Within the Inuit community of Kikiak (Rigolet) changing climate conditions threaten the functioning of municipal water systems, water security and the viability of traditional livelihoods. This study assesses the sensitivity of freshwater sources and municipal water systems to changing climate conditions and the significance of these changes for the well-being of Kikiak (Rigolet) residents.

Arctic Bay

Arctic Bay. Photo: Trevor Bell

Climate change presents risks to community infrastructure including buildings, roads, and port facilities, and threatens to alter the semi-permanent trail networks which link communities and culturally important hunting areas. This study uses a vulnerability approach to integrate insights from the social and physical sciences to characterize infrastructural vulnerability to climate change in Arctic Bay.

Ulukhaktok

Photo: Tristan Pearce

In the context of subsistence hunting, changes in temperature, seasonal patterns, sea ice and wind dynamics, have exacerbated risks associated with hunting and travel.

Limited access to capital resources, changing levels of environmental knowledge and land skills, and substance abuse were identified as key constraints to adaptation.

Tuktoyaktuk

Photo: Mark Ayles

The reliance of Inuit in Tuktoyaktuk on wildlife harvesting for food, livelihoods and culture makes them susceptible to environmental disturbances and changes. Coastal erosion threatening infrastructure in Tuktoyaktuk is expected to intensify due to longer ice free summers and strong storm events in late summer that are projected to occur due to climate change.

Igloolik

Photo: Grete K. Hovelsrud

Climate change is exacerbating Inuit women's vulnerability to food insecurity in Igloolik, Nunavut. Later and longer sea ice freeze up has constrained Inuit women's ability to obtain traditional food: "When the ice was plentiful around here there were numerous walruses. That's not so anymore. We have not yet caught any walruses near here this year." (Inuit woman elder)

Dawson City

Dawson City. Photo: Frank Duerden

Dawson has adapted to flooding, perma-frost disturbance, forest fires and ecosystem shifts, through careful location of infrastructure and local resource management. Climate change may challenge the current adaptive capacity and economic base, and require further adaptations.

Clyde River

Meeting in Clyde River. Photo: Trevor Bell

This study presents a model of how constraints imposed by the physical landscape on infrastructure in the Canadian North can be assessed and integrated into a community planning protocol.
Examples of landscape hazards that constrain community planning and undermine infra-structure in Clyde River include coastal flooding and erosion, permafrost degradation, drainage network disruptions, and slope instability.

Kaktovik

Photo: Kristen Ian Weber

Climate Change must be considered as unfolding alongside other forces of change, such as economic conditions that affect food costs, energy costs (fuel), and out migration from villages to urban areas. The interaction of these forces has implications in understanding the exposure/sensitivity calculus of vulnerability for Indigenous Peoples in northern Alaska.

Hopedale

Hopedale. Photo: Laura Flemming

Existing socio-economic stresses and political change, exacerbated by changing climatic conditions, are affecting the livelihoods of Hopedale residents.

Multi-level institutions as well as distinct western and Inuit knowledge systems, are playing a central role in shaping (both facilitating and constraining) the community's capacity to adapt.

Shoyna

Photo: Tero Mustonen

Reindeer herders have a long tradition of adaptation to a highly variable climate. New and unexpected weather conditions have caused reindeer pasture to be iced over in winter, and troublesome insect abundance in summer. Dispite this the Nenets main cause of concern is competition with oil companies over land use and access.

Qeqertarsuaq

Photo: Eileen Cashman

This study explores the influence of climate change on food security and the future of traditional livelihoods in this majority Kalaallit (Inuit) community.

Next steps involve a second Greenland case study and a comparison of these findings with a similar study in Nunavut, thus helping to facilitate community preparedness and reducing the vulnerability of local food systems to the threat of climate change.

Revda

Photo: Tero Mustonen

Significant social, economic and environmental changes are occurring amongst the Sámi reindeer herders in the Murmansk region. Warmer and wetter winters, and longer warmer summers affect the reindeer and their pastures, which in turn contributes further stress to the herders and their families. Adaptation strategies must also include governmental support.

Húsavik

Húsavik. Photo: Nesi Erlendsson

In the wake of economic and environmental changes, people in the fishing town of Húsavik in northern Iceland have shown significant social adaptability in constructively incorporating the new whale watching industry into the existing cultural fabric. Processes and pressures from outside of the local community are turned into resources as a result of a creative coexistence of old and new livelihood strategies.

Vestvågøy

Vestvågøy. Photo: Halvor Dannevig

In Vestvågøy, Lofoten, cod fisheries and stockfish production are important to the local economy and an inherent part of the place identity. Currently the cod fisheries are shifting north, making it harder for stockfishproducers to secure rawmaterial. Furthermore the market for stockfish has been in decline. Adaptive strategies consists of new ways of cooperating with fishers to secure landings and product innovation.

Nesseby

Nesseby. Photo: Trine Rybdren

In this coastal Sámi community the combination of different nature based activities is of great significance for the residents in terms of income, recreation, local identity and sense of belonging.

"Traditional" flexibility is now reduced by alterations in management structures and socio-economical and political systems. This may reduce the local adaptive capacity to climate change.

Lebesby

Kjøllefjord. Photo: Jan Ove Sundquist

Vulnerability and adaptation to climate variability and change is currently being explored in relation to wider social, economic and environmental factors affecting local coastal fisheries.

Local responses to changes in fish stocks will require adaptations by individuals, communities and institutions. A variety of cross-scale adaptation barriers and opportunities for adaptation are evident.

Gällivare

Photo: Lowney Wakmeda

This study explores the impacts of climate change on four sectors in the municipality of Gällivare, Sweden: forestry, reindeer husbandry, winter tourism and environmental protection. The study site is located in an area with large environmental protection interests. The study reveals that coordination between different sectors will likely become an even larger issue in a situation where climate change may make resource access less predictable.

Inari

The Ivalo River. Photo: Mona A Tennberg

In Inari, Northern Finland, some times a modern solution for flood protection can become a problem: the flood banks in Ivalo river could turn into dangerous canyons for flood water.

Photo: Grete K. Hovelsrud Presentation: Mark D. Zoebelein

CONSORTIUM PARTNERS

Canada: University of Guelph, Memorial University, Wilfrid Laurier University, University of British Colombia, Mc Gill University, Ryerson University
USA: University of Alaska Fairbanks
Iceland: Stefansson Arctic Institute
Norway: Centre for International Climatic and Environmental Research – Oslo (CICERO)
Sweden: Umeå University
Finland: Arctic Centre – University of Lapland
Russia: Herzen State Pedagogical University of Russia

CICERO
Senter for klimaforskning
Center for International Climate and Environmental Research – Oslo

INTERNATIONAL POLAR YEAR

UNIVERSITY of GUELPH