Arctic Community Resilience to Boreal Environmental Change: Assessing Risks from Fire and Disease (ACRoBEAR)

The Arctic has warmed rapidly over recent decades, at around twice the rate of global mean temperature increases. Changes in the high latitude terrestrial environment include observed increases in temperature extremes and precipitation patterns. These increase likelihood of boreal wildfires and changes in appearance and dispersion of natural focal diseases (NFD), such as anthrax or ticks. The goal of the project is to predict and understand health risks from wildfire air pollution and natural focal diseases at high latitudes, and resilience and adaptability of communities across the region to these risks. We use a combination of satellite and in-situ observations, modelling, health data and knowledge, and community knowledge and stakeholder dialogue.

We will:

1. Determine variability and trends in fire-sourced air pollution across three high latitude regions (Alaska, Siberia, Sweden) and the pan-Arctic region, and associated societal health impacts.
2. Connect natural-focal disease (NFD) occurrence and weather conditions, wildfires and disease dispersion.
3. Connect climate variability to increasing risk of fire-induced and NFD-induced health impacts across the pan-Arctic region, and their interactions.
4. Estimate future changes in risks under a range of projected climate scenarios and identify common and competing climate drivers for these risks.
5. Investigate local perceptions and experiences of wildfire and NFD health risks in local communities in Scandinavia, Siberia and Alaska and identify the factors governing societal vulnerability and resilience in the changing environment.

6. Produce a web interface to decision-making needs in order to understand and map these risks historically and to identify adaptation actions under different climate and policy scenarios.

The specific focus of the team in University of Helsinki (UHEL) is to analyse the connection between the dispersal of NFD in the Russian Arctic and the climate change scenarios. This can give new insights into the risk assessment of the appearance and dispersal of NFD in the changing climate. We also contribute to the analysis of dispersion of aerosol particle emissions from the fires.

More information:

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