CERH
Center for Environmental and Respiratory Health Research

UNIVERSITY of OULU
OULUN YLIOPISTO

Arctic environment, people and health – Building bridges between research and policymakers

Seminar background

1. Seminar purpose

The main objective of the seminar is to bring different actors together to discuss the dimensional effects of climate change and to identify the main gaps of knowledge. The scientific community and policymakers have identified the need for multidisciplinary research activities to study the effects of climate change and collaboration between researchers and policymakers. This seminar aims to answer this call. This seminar is also organized to meet the terms of reference of CERH as a collaborating center to contribute with outreach and dissemination of information as per request from WHO.

The seminar focuses on the Arctic - **Finland will lead the Arctic Council in 2017-2019.**

2. Climate change

Climate change is one of the greatest challenges of our time. The world has moved to a new geological epoch, anthropocene in which human activity has become the dominant force for environmental change. IPCC has estimated with very high confidence that the Arctic region will warm more strongly than the global mean. Between 1850-2010 the global mean temperature has increased 0,85 °C.

The climate change is happening. Individuals and people around the world have observed changes in their everyday life. A recently published meta-analysis on climate change reported 10,660 observations in 2,230 localities across 137 countries. The meta-analysis shows that increases in temperature and changes in seasonality and rainfall patterns are widespread (≈70% of localities across 122 countries).

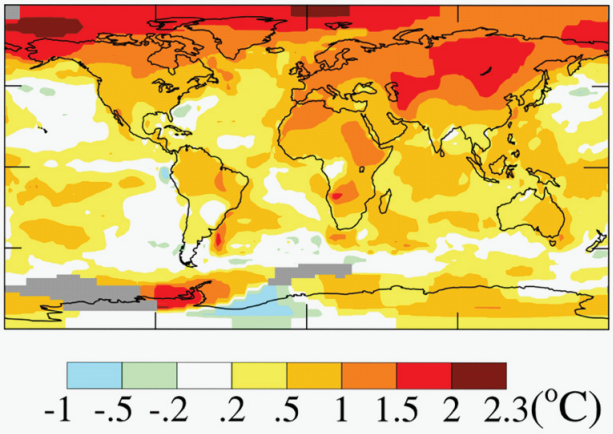

Figure 1. Global temperature change 1950-2000. Picture: Finnish Meterological Institute.

In Finland the longterm changes in climate have been monitored. Presently, snowmelt occurs one week earlier than 30 years ago. Early winter is 4. 8 °C warmer than in 1850's. By 2099 in Finland winter probably shortens by 2-4 months and summer lengthens by slightly over 1 month.

The biodiversity is also changing. The growing season lengthens, tree lines move to more and more north. New invasive species emerge while arctic species are disappearing. Climate change is having profound disruptive effects at local levels. These observations together with scientific evidence can make an important contribution to understanding the pervasiveness of climate change on ecosystems and societies.

3. Climate change and health

Climate change is the biggest global health threat of the 21st century and it will affect directly or indirectly all populations. There is a growing amount of evidence of adverse health effects of ongoing climate change. Direct effects include mortality, morbidity and accidents linked to excessive weather phenomena such as increasing number and amplitude of heat waves and cold spells and flooding.

Secondary effects are caused by changes in microbial ecology such as host animals, vectors and pathogen multiplication and may include increased risk of infectious and allergic diseases. Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year globally. **Recognizing the effects of climate change on health is important to be included in international and national policy debate.**

4. Identified challenges

Climate and biodiversity are complex. The researchers around the globe are studying the recent changes brought by anthropocene period. The complexity of the natural world, human dependency on biodiversity, causal and complex pathways and processes that climate change alters need further studying and understanding. Loss of biodiversity has been for example suggested to increase asthma and allergies and spread of infectious diseases.

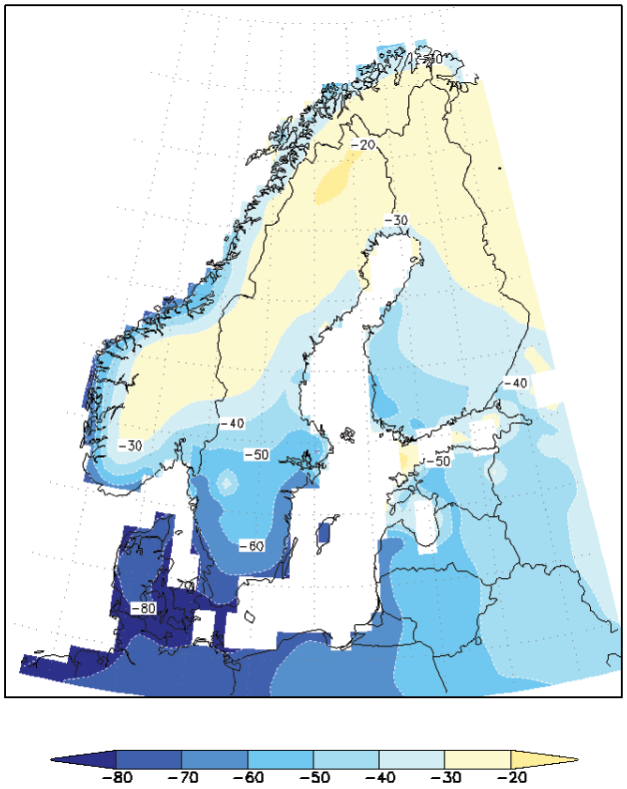

Figure 2. Change in days with snowcover in percentages, 2071-2100 compared to 1961-1990. Picture: Finnish Meterological Institute.

The direct and secondary influences of climate change, like extreme weather events and adverse health effects of extreme heat and cold can easily be understood and determined. But climate change may also have tertiary effects that can further be identified as political, social and cultural effects. Already reported tertiary effects like climate migration (climigration), political instability and cultural change have profound and unforeseeable effects on a global scale. These effects need studying and monitoring. Researchers have predicted that large areas Middle East and North Africa will become practically inhabitable due to climate change introduced drought, heat waves and rising mean temperature by the end of this century. Finland as arctic nation will warm more quickly and encounters the direct, secondary and tertiary effects, like predicted climigration. **The world is changing and we need to be prepared.**

The global consensus is to limit global warming well below 2°C. The Paris Agreement sets out a global action to meet this aim and governments also agreed to strengthen societies' ability to **deal with the impacts** of climate change. New policies are being drafted on climate adaptation and mitigation and researchers are studying whether the political measures are sufficient.

Especially the environmental impact of climate change have been monitored, but little is known about it's various health effects, susceptible populations, and appropriate methods of mitigation and adaptation. Research data is available, but data management, regional scenarios and practical summaries for the policymakers are needed more than ever.

Policymakers and researchers have identified the need of **indicator systems** that monitor environment, health, well-being, culture and economy in changing climate. However, this requires resources, systematical work and basic and applied research. Despite the fact that Finland has vast registries, a lot of essential information needed in climate change research is derieved from other sources – **we need fundamental and innovative interdisciplinary research**.

Figure 3. Melting permafrost (palsakumpu) in the Finnish Lapland. Picture: University of Oulu.

CERH as *WHO collaborative center on Global Change, Environment and Public Health* participates on finding solutions and new data. CERH has planned in collaboration with the project partners three extensive research projects and proposals to study and help climate change adaptation and meet some of the global challenges that the Arctic is facing: culture change, climate adaptation and climigration.

Project *Arahat* creates indicators to monitor influences of climate change to the environment, health, well-being and culture of Saami people. The project represents a groundbreaking initiative that elaborates western science together with perceptions and knowledge of Saami people on climate change and creates collaboration and bridges between research, every-day life, research subjects and authorities. The project is a pilot project and indicators and methodology created in can be used to study influences of climate change especially in the Arctic but also globally.

The project: ***G**lobal Change, **A**rctic Environment and **P**ublic Health Research (**GAP**)* evaluates the impact of the most relevant environmental factors, such as extreme temperatures, air pollution, allergenic pollen, and housing factors, involved in global climate change on public health. The overall aim is to assess the health impact and burden of disease from environmental exposures directly or indirectly related to global environmental change and explore climate change mitigation and adaption approaches with a special reference to health and wellbeing

The project *Adaptation of asylum seekers and refugees to an Arctic climate* improves health and wellbeing of asylum seekers and refugees, and particularly the susceptible population groups, related to increasing awareness and developing coping and appropriate behavior during the wintertime through research and training. The project improves abilities of key persons responsible for the affairs of asylum seekers and refugees to deliver information of the effects and protection from cold weather. Finally, a national model is developed for various key persons in order to increase awareness of cold-related health effects and protection as a part of the reception of asylum seekers, as well as during the following homing process of refugees.

To meet the political and research challenges in changing climate we need bridges between research and policy-making. We need to act now. CERH wants to act with you.

More information: www.oulu.fi/cerh

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