



ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

EXPLORING COMMON SOLUTIONS IN ARCTIC METEOROLOGY

FINLAND'S CHAIRMANSHIP
OF THE ARCTIC COUNCIL 2017-2019



GENERAL OBJECTIVES

Finland chairs the Arctic Council
in 2017-2019.

One of the chairmanship priorities is
improving meteorological collaboration.
This is needed in order to ensure safety
and sustainability in the entire Arctic region
today, tomorrow and in the far future.

The wide arctic meteorological community
has carefully prepared joint messages
to the Arctic Council and the entire
Arctic stakeholder forum of how
to develop arctic meteorology,
in particular information
of weather, ocean and climate
change through
collaboration.

Where do we stand?

WE NEED TO IDENTIFY THREATS CAUSED BY ARCTIC CLIMATE CHANGE

The Arctic experiences an unprecedented and rapid climate change with potentially dangerous global implications. The Arctic sea ice has melted to record low levels, snow retreats with major hydrological changes, ocean waters are acidifying, ecosystems face increasing stress, and Arctic communities are in risk of losing their traditional lifestyles. However, what we do not know is the exact magnitude of the Arctic change, in particular due to feedback processes, and its implications outside the Arctic, at lower latitudes. Furthermore, the state of the Arctic climate, including its biosphere, remains with many respects largely poorly known.

SCIENTIFIC KNOWLEDGE OF ARCTIC CLIMATE CHANGE IS NEEDED

There is a large and diverse collection of information on Arctic climate change available in a variety of formats. Therefore, one challenge is to collect the relevant bits and follow ongoing activities to obtain up-to-date scientific knowledge on the topic. International commitment is required to sustain critical observational infrastructure, coordinated campaign observations, and data management for the Arctic. To comprehensively understand the ongoing change and to prevent or slow down projected future changes, better coordination, collection and delivery of available Arctic environmental information is needed. In particular, we need to increase the observational coverage in the Arctic and improve models, especially process feedbacks, in order to holistically understand the state and changes of the Arctic climate system.

TRADITIONAL AND NOVEL COMMUNICATION METHODS ARE THE KEY

To maximise effective knowledge sharing we need both traditional and novel tools. Open Science approach with facilitating and advocating open access to data, tools and guidance is vital. The arctic meteorological community should adopt a new approach for the use of information sharing channels including social media. Using climate services, with their communication and data sharing expertise a larger audience would be reached. Finally, we cannot underline enough the importance of disseminating the latest scientific knowledge for decision makers.

METEOROLOGICAL OBJECTIVES

70 % 8 m/s -10°
-10° ❄️ 0,2 mm
11 m/s 60 %

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Potential for meteorological collaboration

COMMON CHALLENGES, COMMON SOLUTIONS - MULTIPLE WAYS OF COLLABORATION

The research community shares common scientific problems and has a strong motivation to collaborate in developing monitoring, models and services for the Arctic. Already existing research infrastructures and networks as well as operational programmes remain efficient but should be better utilised. Moreover, we can establish an improved platform for sharing forecast and analysis tools, and enhance the use of observations and assimilation techniques. Our goal is to design a coordinated, multidisciplinary, user friendly, open access data management system for Arctic observations.

KNOWING THE UNKNOWN, MANAGING THE RISKS

To quantify specific risks related to the Arctic threats, vulnerability assessments should be used to identify implications. Such approach unveils critical data and research gaps. Changing oceanic and atmospheric circulation, extreme climate and weather events, ice-sheet ocean interaction and arctic-mid-latitude linkages will certainly remain on top of such list. Smart adaptation measures can be designed and targeted through good risk assessment and management.

JOINT FORECASTING SYSTEM ENSURES SAFE LIFE AND OPERATIONS IN THE ARCTIC

There is a clear need for a joint pan-Arctic forecasting system to ensure safety in the area. The system would provide consistent information and forecasts of weather, ocean and climate across the Arctic.

COMMUNITY OBJECTIVES



We all belong to the arctic community - also in the future

CRITICAL MISSING PIECES REMAIN

Complex interactions and feedbacks between all Arctic system components are still not fully understood, but we know they have dramatic global implications. Understanding arctic climate variability and its extremes are a prerequisite for designing adequate adaptation measures. Cross-border commitment is required to sustain and develop critical observational and monitoring infrastructure, coordinated campaign observations, data management and meteorological modelling for the Arctic.

LET'S FOCUS ON REMOTE SENSING!

Satellites, and remote sensing solutions in general offer perfect tools and systems for improved utilization of large data sets and archives. Arctic is an ideal showcase for satellite applications and services, later to be extended even over other remote and large areas (e.g. the Third Pole and other high mountain areas). Ice sheets and ice caps, freshwater flux, permafrost and greenhouse gases – all these and much more can be monitored using remote sensing techniques. In the future, satellites are vital for providing adequate information for services and enabling everyday life, entrepreneurship and operations in the Arctic – for us.

WE WANT TO INTERACT WITH THE ENTIRE ARCTIC COMMUNITY

Up-to-date and efficient knowledge sharing is crucial for adaptation and resilience measures in the Arctic. It stimulates much needed interaction between researchers, citizens, decision and policy makers and any other stakeholders – we are the arctic community. Here Arctic Council and its permanent working groups play a central role, and the arctic meteorological community is at its service.



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