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Top-level Research Initiative

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-A major Nordic venture for climate,
energy and the environment

Magnus Friberg
Chair of IPCC Programme Committee
IPY Oslo Science Conference, 10 June 2010

The Nordic region

- The Nordic countries;
 - Denmark
 - Finland
 - Iceland
 - Norway
 - Sweden
- The Nordic countries have collaborated extensively through the Nordic Council (parliamentarians) since 1952 and the Nordic Council of Ministers since 1971



Background

The Nordic Prime Ministers stated in the Riksgränsen declaration (2008)

“The Nordic region is in a strong position to pioneer efforts to combat climate change.

We will therefore intensify Nordic cooperation and promote initiatives striving to ensure that a new international climate agreement is reached in 2009.

A sustainable Nordic model for meeting climate challenges will demonstrate the potential for combining reduced emissions with economic growth”.



Goals of TFI

- Nordic coordinated efforts towards research and innovation on climate, energy and the environment.
- Develop collaboration between research and innovation organizations and institutions in the Nordic countries.
- Act as a platform for further international collaboration.

Horizontal themes:

- Advanced climate modeling
- Social sciences and humanities
- A focus on the Arctic area

Added value of the programme

- Promote the Nordic region as a leader within certain areas of the energy and climate sectors.
- Strengthen national research and innovation systems.
- Pave the way for greater mobility of competencies.
- Ensure the highest quality in research and innovation.
- Provide a platform for increased international cooperation both within the EU and beyond.
- Enhance Nordic participation in EU and European Research Area (ERA).

Utilise research and innovation to counteract economic downturns and building competencies for the future.

Research questions being addressed (1/2)



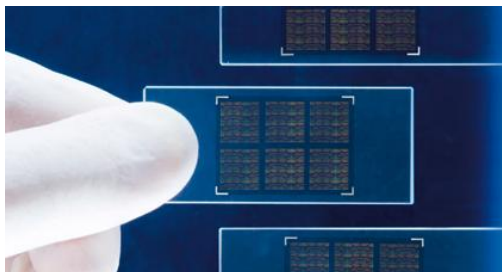
Effect studies and adaptation to climate change

Impacts of climate change, and the adaptation needs of the society as well as new opportunities



Interaction between climate change and the cryosphere

Science driven questions of high interest to society, science, industry and/or infrastructure



Energy efficiency with nanotechnology

Future efficient and sustainable energy systems in the transport sector, electricity production and utility

Research questions being addressed (2/2)



Integration of large-scale wind power

Focus on grid issues, energy balances and energy markets issues



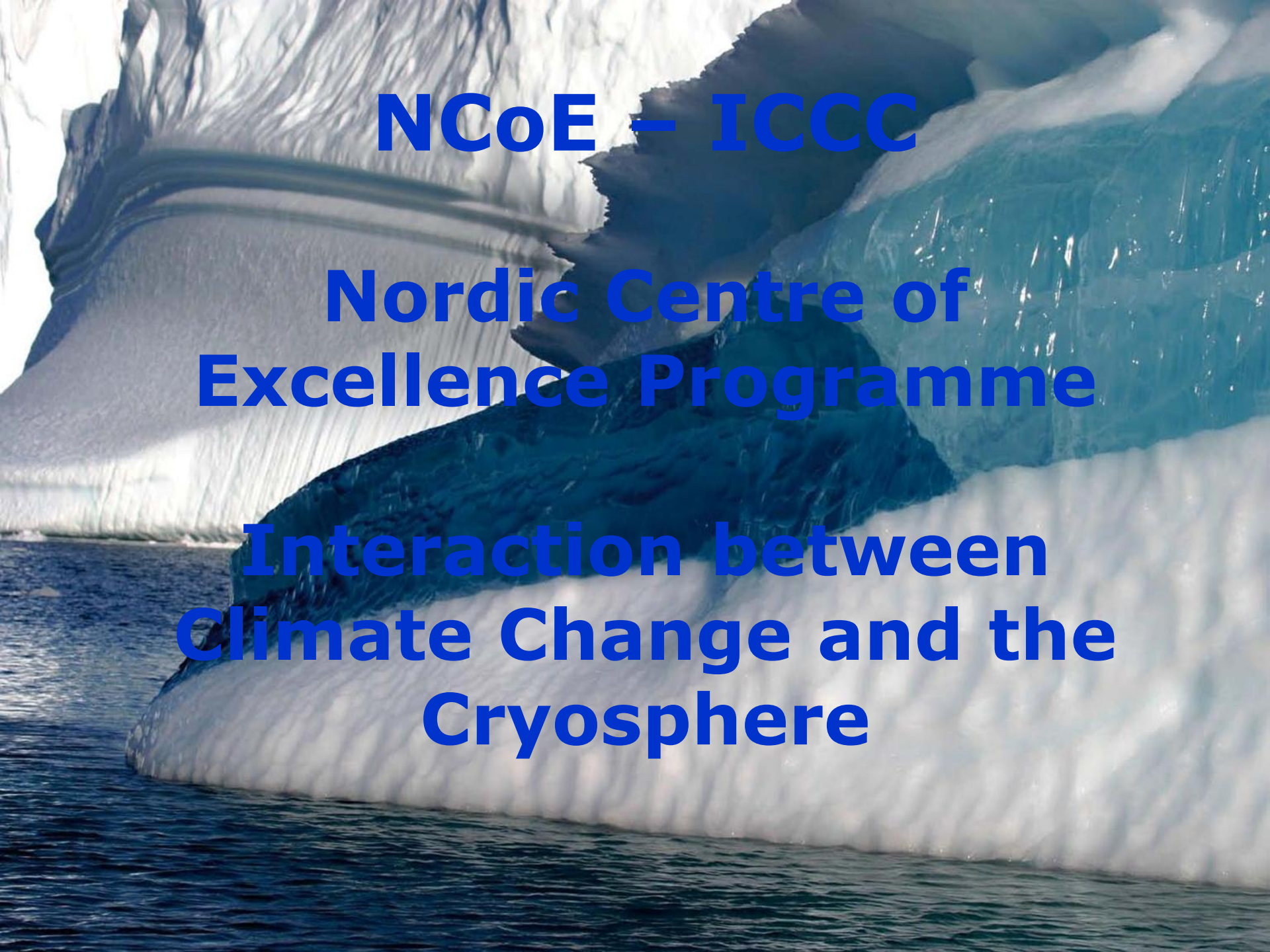
Sustainable biofuels

Renewable bio-fuels from non-food resources such as wood and agricultural residues



CO₂ – capture and storage (CCS)

Coordinate research and innovation and exchange of experience among Nordic countries to avoid manifold investments in the same themes



NCoE – ICC

**Nordic Centre of
Excellence Programme**

**Interaction between
Climate Change and the
Cryosphere**



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The 'current' ICCC programme Committee

Sweden

Magnus Friberg, Swedish Research Council

Denmark

Inge Sandholt, University of Copenhagen
(at present temporary member)

Iceland

Kristján Kristjánsson, Reykjavik University

Norway

Jostein K Sundet, The Research Council of
Norway

Finland

Harri Hautala, Academy of Finland

Sweden

Sofie Björling, FORMAS

Secretary

Michael Andersson, Nordforsk - TFI Secretariat

Dorthe Dahl-Jensen, Denmark

Jens Hesselbjerg, Denmark

Paula Kankaanpää, Finland

Hrefna Jóhannesdóttir, Iceland

Kenichi Matsuoka, Norway



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Call for NCoE “Interaction between Climate Change and the Cryosphere” (ICCC)

The objective of ICCC is to support **science driven questions** of high interest to society, science, industry and/or national infrastructure in order to:

- Improve our understanding of the cryosphere stability, dynamics and interaction with climate change
- Integrate field- and laboratory measurements with climate and ESM models
- Enhance the cooperation between academy, industry, public authorities and policy-makers to meet the future challenges provided by climate changes
- Reinforce the Nordic climate research institutions as attractive partners in international research collaborations



Evaluation of applications

- Seven applications were received by the submission deadline
- The applications were evaluated by a non-Nordic expert panel
- The scientific questions addressed in the applications varied and were in general of high quality and prepared by prominent researchers
- The decision of the programme committee was based on the scientific evaluation
- The programme committee and the evaluation panel received excellent support from Dr. Michael Andersson of the NordForsk Secretariat



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Features of the centres in the NCoE programme

- Each NCoE has partners from all five Nordic countries, one including Greenland
- The NCoE programme has participation from the other Arctic countries (Russia, USA, Canada) and the UK
- Each NCoE has about 17 partners
- The NCoE programme involves about 340 researchers

Presentation of the Centres

- SVALI – Stability and Variations of Arctic Land Ice
Jon Ove Hagen, University of Oslo, Norway
j.o.m.hagen@geo.uio.no
- DEFROST (mainly biogeochemistry and permafrost)
Torben R. Christensen, Lund University, Sweden
torben.christensen@nateko.lu.se
- CRAICC – Cryosphere-Atmosphere Interactions in a Changing Arctic Climate
Andreas Stohl, Norwegian Institute for Air Research (NILU)
Project leader: Markku Kulmala, University of Helsinki, Finland
kulmala@cc.helsinki.fi



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Objectives of each NCoE

SVALI – Stability and Variations of Arctic Land Ice

- A comprehensive joint Nordic research programme to study basic processes (flux of melt water and icebergs from glaciers)
- Using remote sensing, airborne and in-situ measurements
- Carry out advanced Earth system Modelling
- Focus on glaciers in the Arctic /N-Atlantic area.
- Establish a Nordic graduate school in cryosphere science and Earth System modelling



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Objectives of each NCoE

DEFROST

- To improve our understanding of Arctic terrestrial and shallow sub-sea permafrost interactions with climate
- To provide improved data on energy exchange, carbon cycling and GHG emissions from terrestrial and near coastal cryospheric environments
- To improve on climate model capabilities for simulating the feedback processes associated with observed changes in permafrost, snow and ice



CRAICC – Cryosphere-Atmosphere Interactions in a Changing Arctic Climate

- Role of short-lived climate forcing agents - SLCF
- Identify and quantify the major processes controlling Arctic warming and related feedback mechanisms and to outline strategies to mitigate Arctic warming
- Develop Nordic Earth System modelling
- Supradisciplinary knowledge transfer

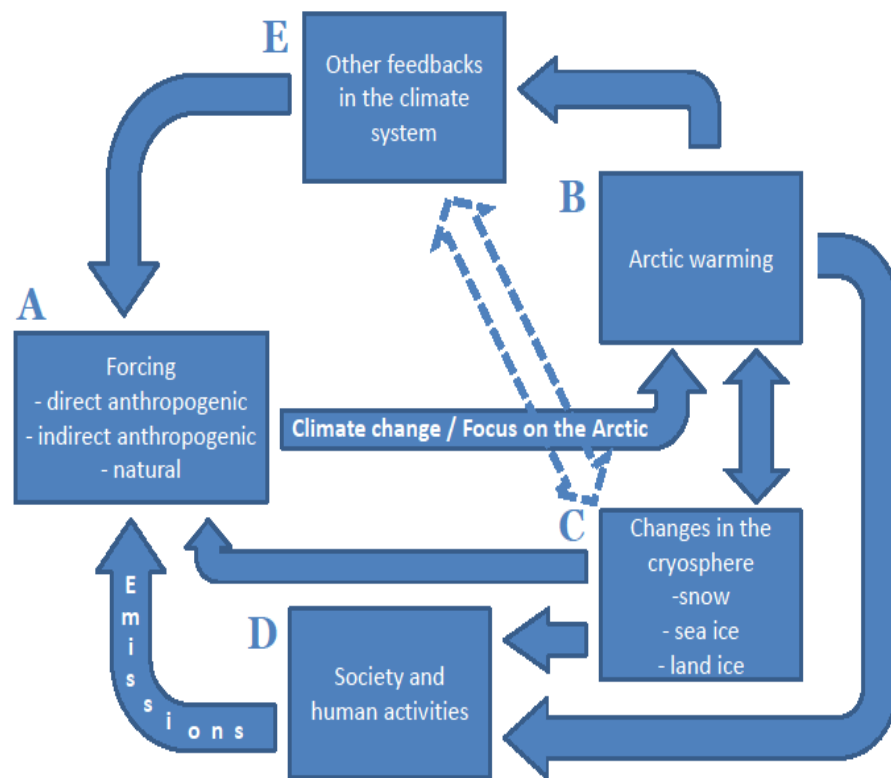


Figure 1. Interlinks between different components in climate change and cryosphere.

ICCC Nordic Centre of Excellence

Virtual centres based on existing research units representing at least three different Nordic countries

- Research of excellent scientific quality
- Visibility and attractiveness of Nordic research in a European and global context
- Efficient and flexible use of the Nordic resources
- Creative and efficient research and research training environments
- Have critical Nordic mass
- Stimulate intra-Nordic mobility of younger researchers in particular
- Stimulate collaboration between disciplines



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ICCC Nordic Centre of Excellence

Project duration is five years (3+2)

Funding covers:

- Support to researcher and key staff
- Fellowships for visiting professors
- Fellowships for post docs
- Fellowships for PhD students
- Nordic graduate schools (research training)
- Equipment
- Travel, management and coordination