

The Fram Centre

Research in the high north under innovative structure



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Photo: Jo Aarseth, Kongsfjorden, Svalbard August 2013



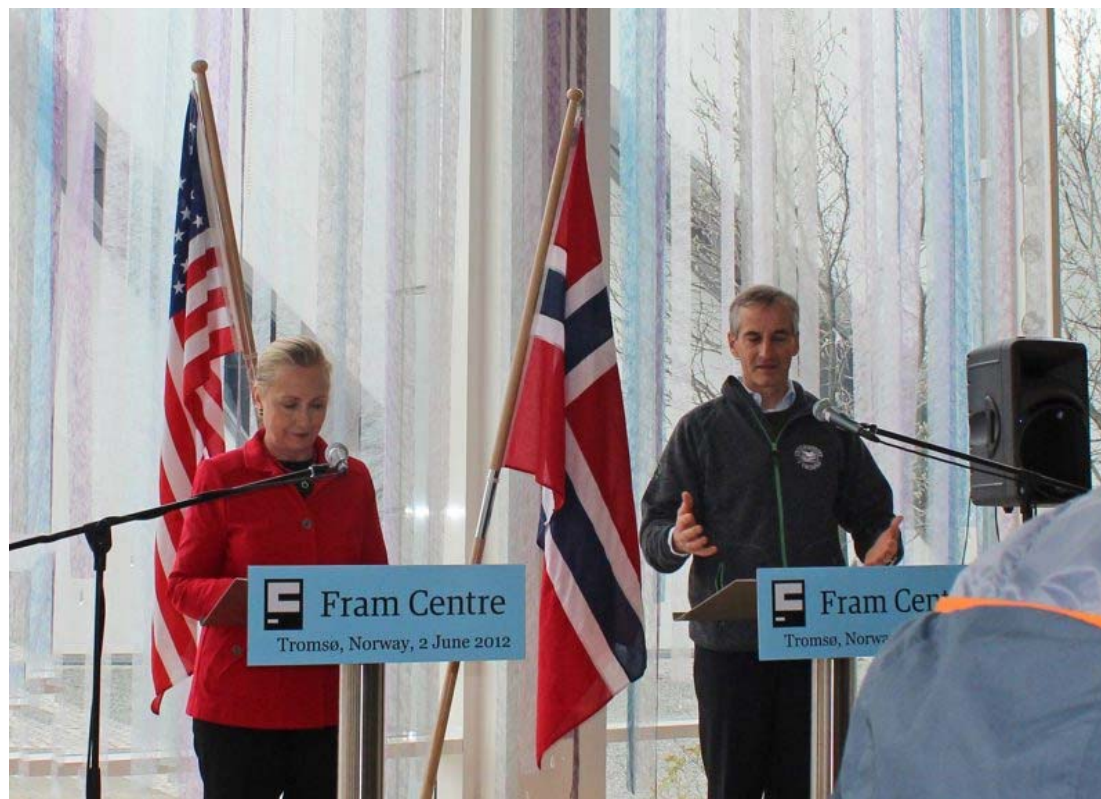
Photo: Ingun A. Mæhlum, Fram Centre

High North Strategy

“The Fram Centre is a new building block in the High North Strategy. Several hundreds of scientists, each of them among the world’s foremost in their respective fields, will here be gathered under one roof. This is going to be a centre of vigour, a key institution for climate research,”

Prime Minister Jens Stoltenberg, September 29th 2010

Former Secretary of State, Hillary R. Clinton visiting the Fram Centre with Jonas G. Støre, former minister of foreign affairs



Focus:

- Research of high quality
- Interdisciplinary studies
- Cooperation with management/society
- Economizing research funds



Photo: Jo Aarseth

Ministerial steering committee

Ministry of Climate and Environment (chair), Trade, Industry and Fisheries, Foreign Affairs, Education and Research, Petroleum and Energy, Agriculture and Food, Transport and Communications

Committee of institutional directors

Fram Centre Ltd.

Secretariat
coordination of research/outreach,
buildings/development

Research heads' group

Arctic Ocean
Sea ice in the Arctic Ocean, technology and agreements

Terrestrial
Effects of climate change on ecosystems, landscapes, society and indigenous peoples

Hazardous substances
Effects on ecosystems and human health

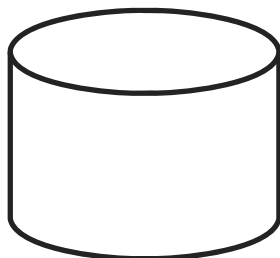
Ocean acidification
Ecosystem effects in Northern waters

Fjord and coast
Effects of climate change on the ecology in the North

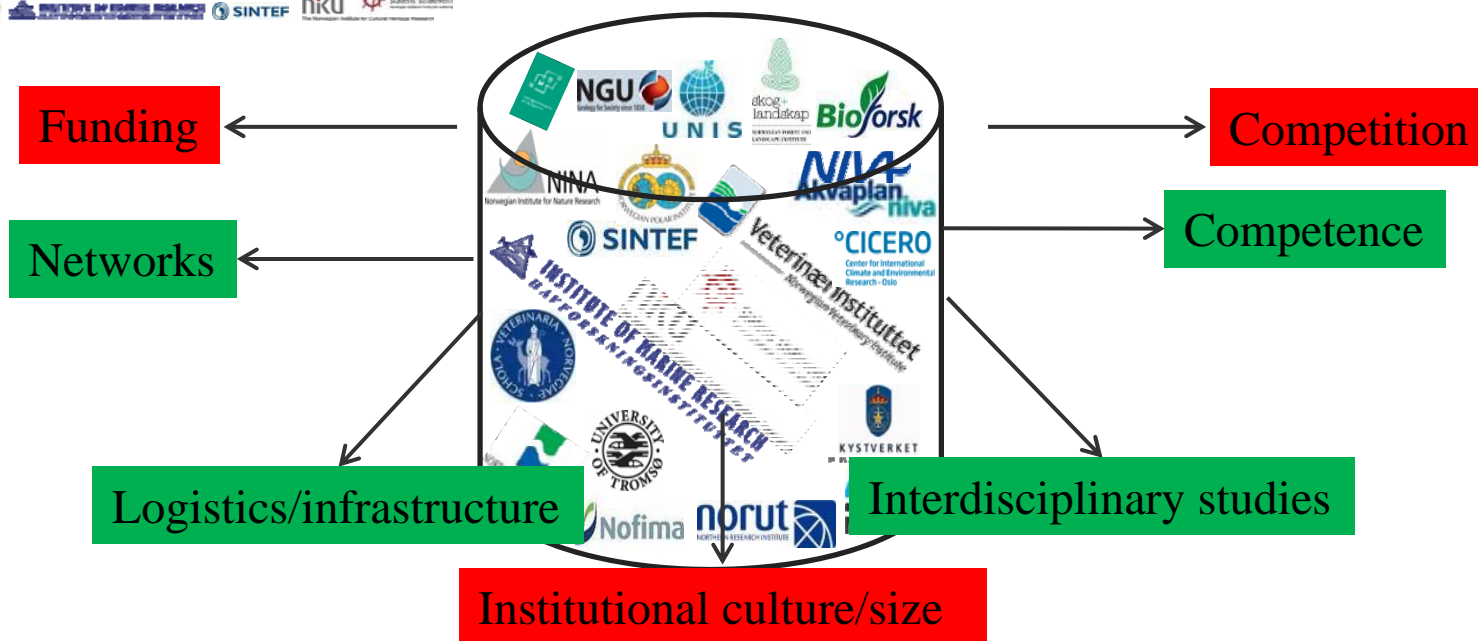
MIKON
Environmental impact of industrial development in the north



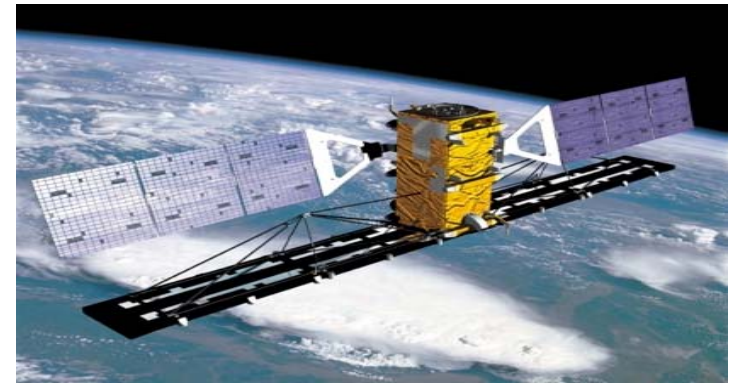
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1. Arctic Ocean-Technology, security and jurisdictions



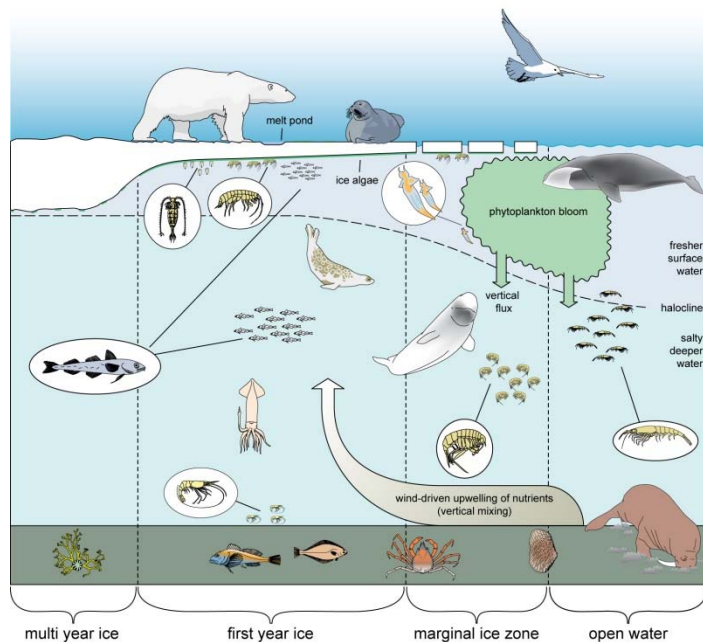
Key questions:

Clima change –
New activities –

What are the expected large scale effects on sea ice and eco systems?
How will activities change and how will these impact on environment and local traditional households? How can we manage this activities in a sustainable manner?

Project examples:

- North-east passage - shipping
- Bulk water and introduced species
- Ecosystems along the ice edge
- Ice: Type, extent of, tickness



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IMO adopts mandatory Code for Ships Operating in Polar Waters

Maritime Safety Committee (MSC), 94th session, 17-21 November 2014

Briefing: 38, November 21, 2014

The International Maritime Organization (IMO) has adopted the International Code for Ships Operating in Polar Waters (Polar Code), and related amendments to the International Convention for the Safety of Life at Sea (SOLAS) to make it mandatory, marking an historic milestone in the Organization's work to protect ships and people aboard them, both seafarers and passengers, in the harsh environment of the waters surrounding the two poles.

The Polar Code and SOLAS amendments were adopted during the 94th session of IMO's Maritime Safety Committee (MSC), which was meeting at the Organization's London headquarters for its 94th session, from 17 to 21 November 2014.

The Polar Code covers the full range of design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in waters surrounding the two poles.

Ships trading in the polar regions already follow international standards adopted by IMO, but the new Polar Code (Preamble, Introduction and Part A) will be mandatory for all ships operating in the Arctic and Antarctic waters.

The Polar Code highlights the potential hazards of changing and severe weather conditions, and the need for ships to be equipped with appropriate construction, equipment, operations, training and search and rescue measures.

As well as mandatory provisions, recommendations are included for ships operating in the Arctic and Antarctic waters.

The map shows the Arctic region with various shipping routes and ports marked. A legend on the right side of the map includes:

- Legend
- Port calls
- Distance sailed
- Traffic and crossing times
- Information

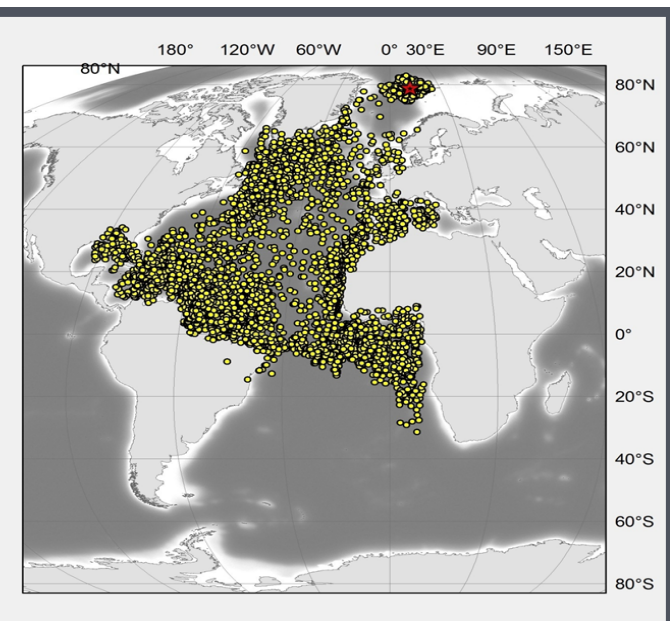
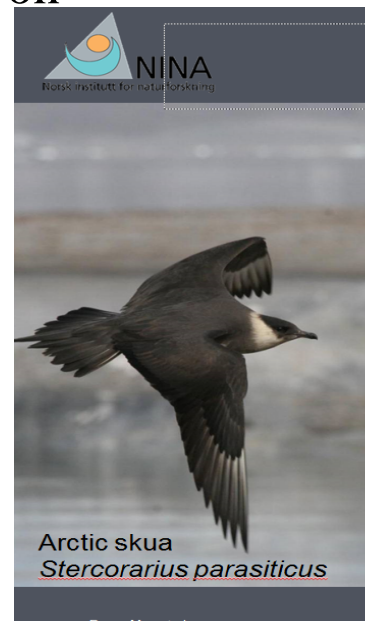
At the bottom of the map, there is a scale bar and a note: "Slett over arktiske områder og skipstrafikk" (Delete over arctic areas and ship traffic).

Effects of climate change on sea and coastal ecology in the north



An arena for interdisciplinary cooperation on management relevant research, education and outreach regarding climate change and changes in fjords and coastal ecosystems.

- Migrating seabirds – new technology improves knowledge and visualizes need for international collaboration in managing species
- Climate change i fjords – migrating herring and whales, heavy impact on fjord ecosystems

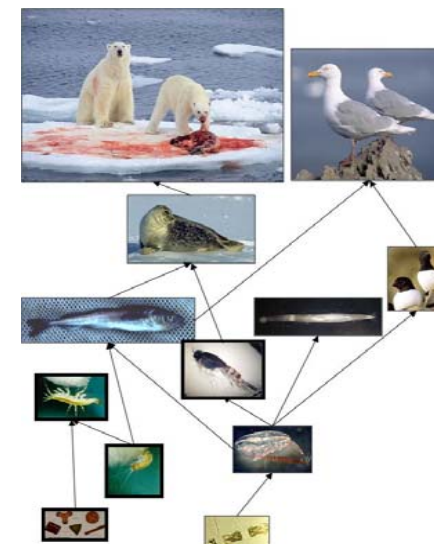


The Arctic – early warning

- Indicator – global spread of contaminants
- The Arctic – heavily impacted by climate change

- Combined effects
- Multistressors
- Disturbed hormones effects
- Food safety

EU, REACH, UNEP,
Stockholm conv.



Food and health security in the Norwegian, Finnish and Russian border region: linking local industries, communities and socio-economic impacts



Cooperation
Norway, Russian and Finland



The Northwest Public Health
Researcher Center, Russia



Institute of the Industrial Ecology
Problems of the North, Russia



Murmansk County
Birth registry, Russia



Photo: Ann-Christine Engvall, Stockholm University



Photo: Ann-Christine Engvall, Stockholm University

Plastic in marine environment – a major international problem



- CLEANSEA (EU prosjekt)
- MIME (NFR HavogKyst)
- Nordic council & Svalbard Environmental Fund
- Flagskip funding

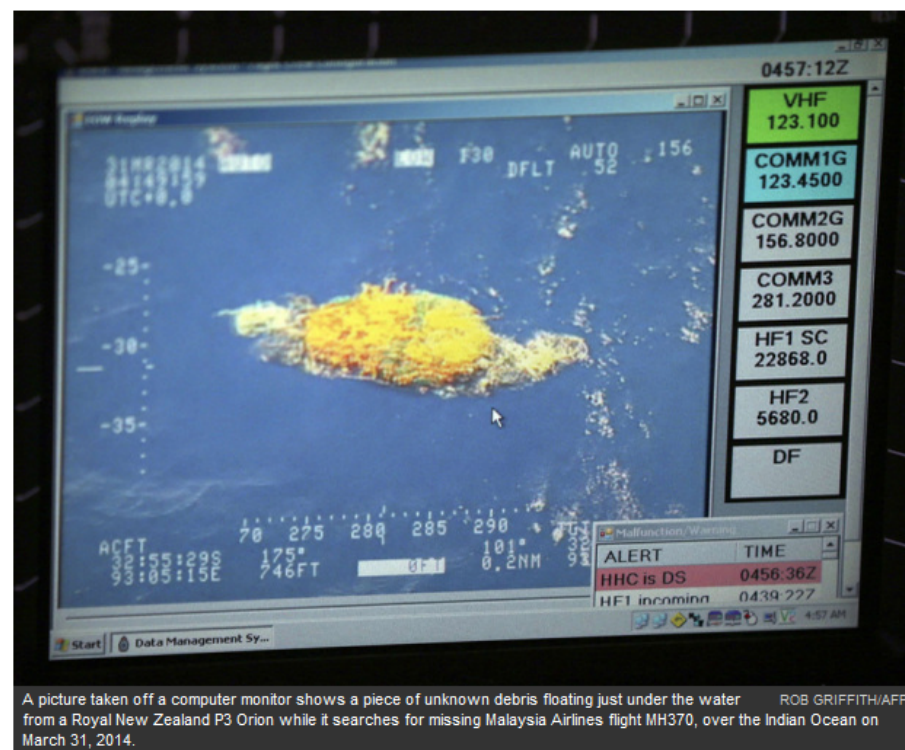
TRENDING

One thing we've learned in the search for Flight MH370 – the world's oceans are awash in vortexes of plastic trash



ASSOCIATED PRESS | March 31, 2014 | Last Updated: Mar 31 3:29 PM ET

[More from Associated Press](#)

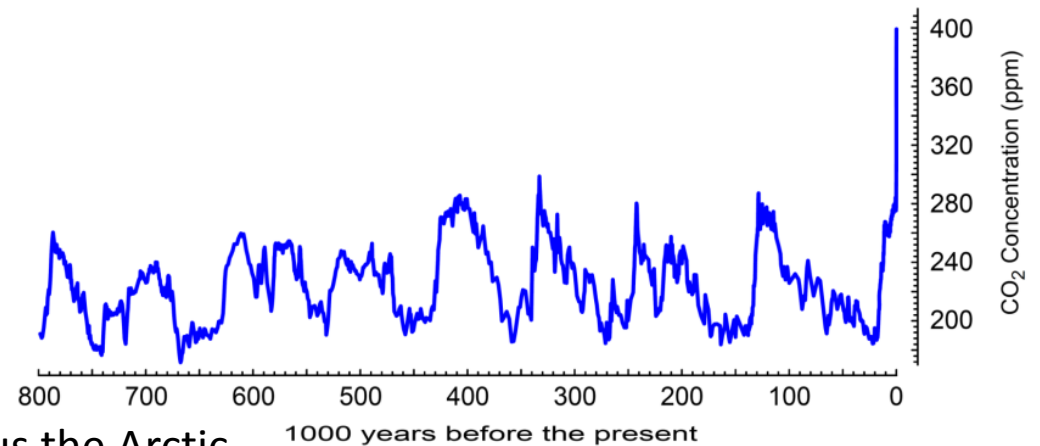


A picture taken off a computer monitor shows a piece of unknown debris floating just under the water from a Royal New Zealand P3 Orion while it searches for missing Malaysia Airlines flight MH370, over the Indian Ocean on March 31, 2014. ROB GRIFFITH/AFP

Flagship ocean acidification

- **Threat to:**

- *Habitats*
- *Marine resources*



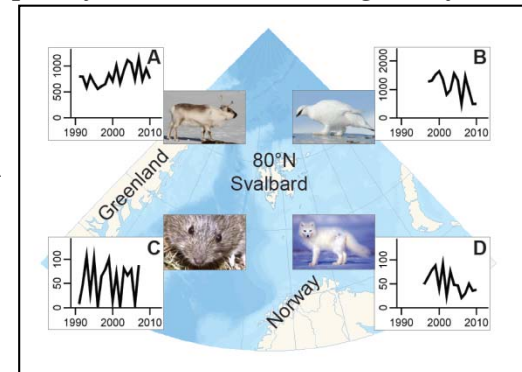
- CO² is absorbed faster in cold water - thus the Arctic is at risk



Climatic effects on terrestrial ecosystems, landscapes, society and indigenous people

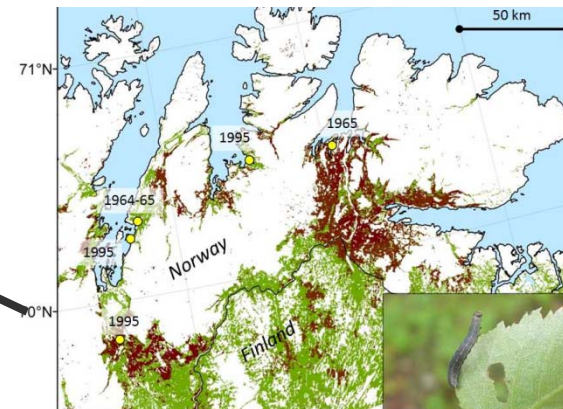
Hansen m. fl. 2013: Science

«High impact from climate change on fauna in Svalbard»

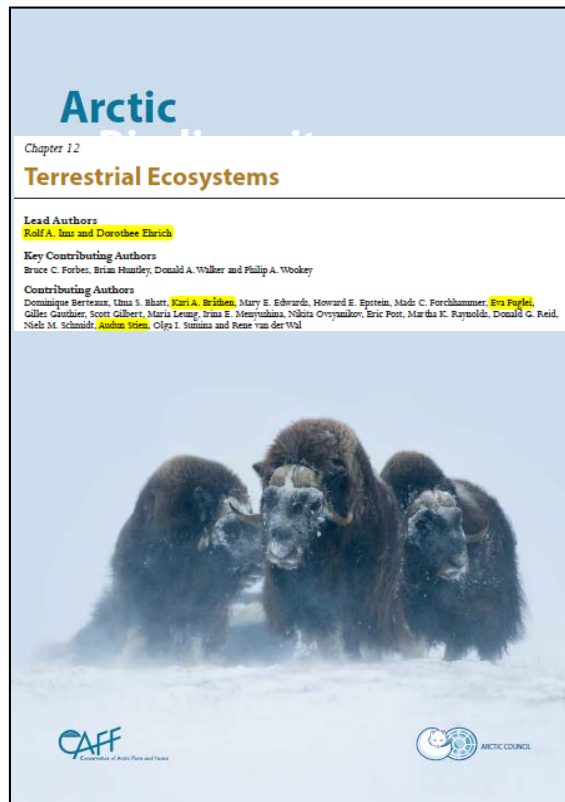


Jepsen m. fl. 2011. Global Change Biology

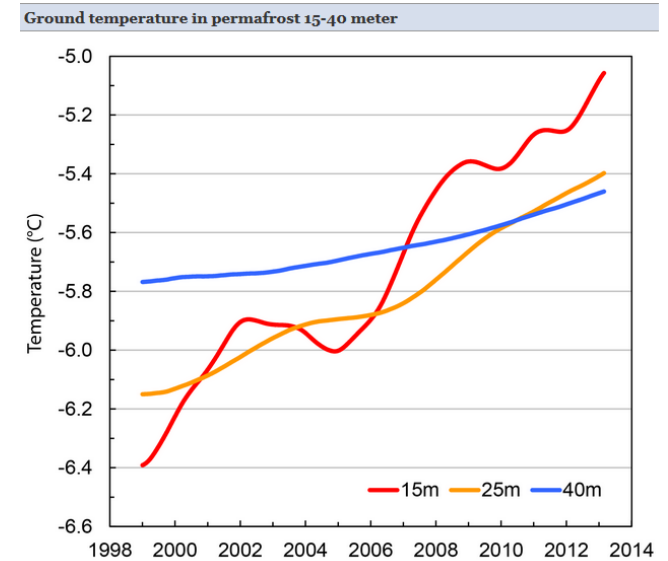
«Moth has caused serious damage to forests in Finmark»



Case Studies



- Moth attacks
- Permafrost
- Tundra ecosystems
- Goose and pasture



MIKON - Environmental consequences of industrial development in the North

Develop a strong scientific group in the Fram Centre which, through targeted R&D, will establish extensive competence and knowledge regarding:

«Environmental consequences of petroleum activity, mining and other industries, new and old, in the North»

Ministry of climate and the environment needs the flagship to give a sound knowledge base for governmental work to limit the «footprint» of industrial development in the North and secure this development within environmentally sound limits.



Reindeer herding and gas industry, Yamal

Expanding industries in the high North

- Petroleum activity
- Mining
- Tourisme
- Wind power
- Shipping
- Infrastructure
- Fishing and aquaculture
- Other industries?



LNG-facility Melkøya, Hammerfest, northern Norway



Seabirdhunt, Greenland

Joint effects on:

- Habitats and organisms
- Ecosystems
- Local societies
- Subsistence living
- Cultural heritage
- Indigenous people