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Environment in the North: Challenges for multidisciplinary research and education

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Sustainability Weeks 2001: Hokkaido – Finland, a bridge for northern cooperation

Facts about the North

- Northern areas are rich in natural resources high in economic value, which gives grounds to their exploitation
- The Northern nature is ecologically sensitive and regenerates slowly
- Nordic areas are an early warning indicator of global changes such as climate change and global warming
- Rapid melting of North Sea ice coupled with technological innovations will increase access to northern areas
- Raising risk from the combined effects of climate change and increased human activity




Facts about the North

The Northern nature is ecologically sensitive / fragile ...

Recovering

Time scale out of our...

Our point of view(s) ?

Our point of view(s) ?

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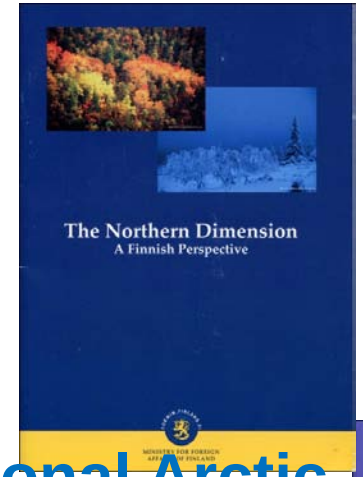
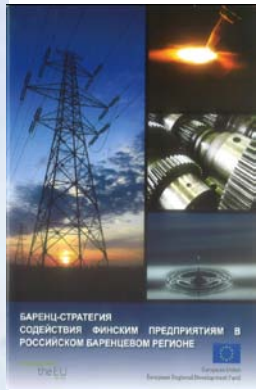
Maximizing the Legacy of IPY in the Arctic

A scoping study for the Arctic Council





IASC - International Arctic Science Committee

Finland's strategy for the Arctic region

Key challenges in the Circumpolar North

- Mitigation and adaptation climate change
- Sustainable use of natural resources
- Economic justice
- Human rights and indigenous sovereignty
- Circumpolar health
  - Call for innovative measures in environmental research and international collaboration

Research programmes of the Thule Institute

- **Global Change in the North** looks at how predicted changes in northern areas are reflected in nature and the prerequisites for human operation.
- **Northern Land Use and Land Cover** focuses on changes in land cover and land use, and factors affecting them and its impacts on environment.
- **Circumpolar Health and Wellbeing** studies human health, wellbeing and adaptation to the northern environment.
- **Environmental Technology** focuses on issues such as water technology, water in processes, sustainable energy, air pollution control and material efficiency
- **Human-Environment relations in the North** – Resource Development, Climate Change and Resilience (FiDiPro programme)
- **Environmental and Resource Economics** Economy-wide material flow accounting and analysis (MFA) combined with the input-output analysis of the product flows of the economy.

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EPB STRATEGIC POSITION PAPER

European Research in the Polar Regions:

Relevance, strategic context and setting future directions in the European Research Area

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IASC - International Arctic Science Committee

- The International Arctic Science Committee (IASC) is a non-governmental, international scientific organization. The IASC mission is to encourage and facilitate cooperation in all aspects of Arctic research, in all countries engaged in Arctic research and in all areas of the Arctic region.

- TERRESTRIAL SCIENTIFIC FOCI
- MARINE SCIENTIFIC FOCI
- CRYSPHERE SCIENTIFIC FOCI
- ATMOSPHERE SCIENTIFIC FOCI
- SOCIAL AND HUMAN SCIENTIFIC FOCI

Cross-cutting, prediction, cooperation joint infrastructure, scientific questions, modeling …

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Key questions and tools

- How do modern technological cycles operate, and what are the environmental implications?
  - Material flow analyses, Design for the Environment, Life Cycle Assessment
- How do the resource-related aspects of human cultural systems operate and what are the environmental implications?
  - Environmental management, consumption analysis
- What is the future of the technology-environmental relationship ?
  - Scenario development, global climate models
- How can we operationally define and address sustainability, as contrasted with responsible environmental performance?
  - System analyses

Green growth ?

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Shared Focus: Thematic Networks Education

A Thematic Network is a group of UArctic members working together on subjects of shared interest to conduct research and create educational programs, such as joint Master's and PhD studies.

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Summary

- Challenges for research and education
  - Materials availability and supply, environmental-, energy- and geographical limitations
  - There is a need for fundamental transformations in energy systems
  - Sustainability is not only about changing raw materials, processes and products
  - It is also about changing corporate culture and the attitudes of people
  - The EU is aiming at "an economy based on knowledge and innovation"
  - We also need to know the impact of innovations on human health and the environment as well as long-term implications
- Trends for future
  - Rising importance of materials science
  - Electronics manufacturing and software development
  - Transparent transportation, transparent commuting
- The future for engineering design
  - It is an increasingly environmentally constrained world
  - Customers need better service and more functionality

Green growth ?

In order to understand the ongoing changes in climate and environment, we need development, integration and investment in monitoring and ***observations*** *to detect changes in the northern and polar areas and their major drivers; research, to* ***understand*** *causes of changes; modeling to* ***predict*** *future changes in northern and polar areas.*

Challenges for multidisciplinary research and education !

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We are facing a lot of new challenges in the North, but…

Thank You

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