

| Highlights of The International Polar Year 2007 - 2008 |



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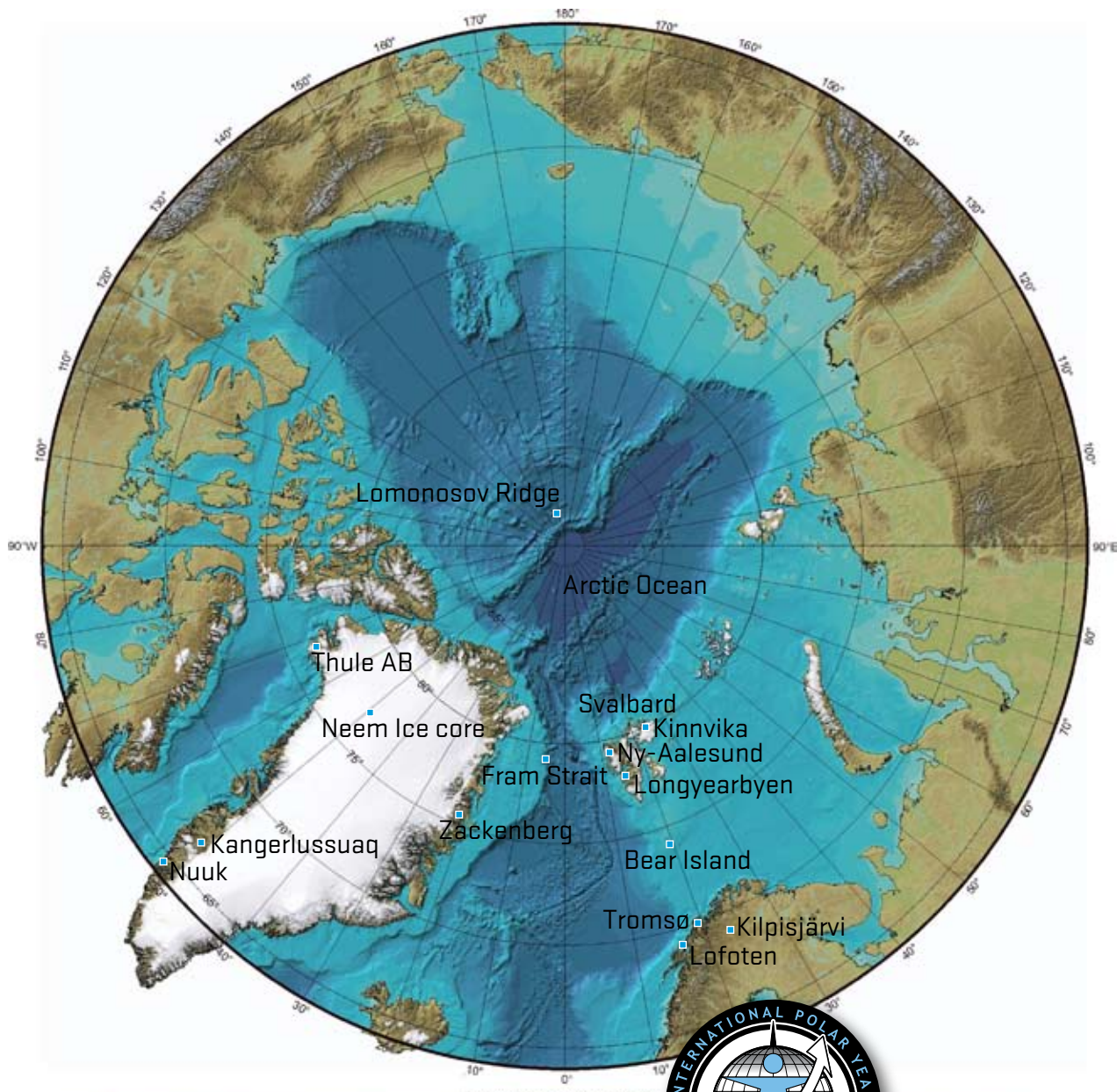
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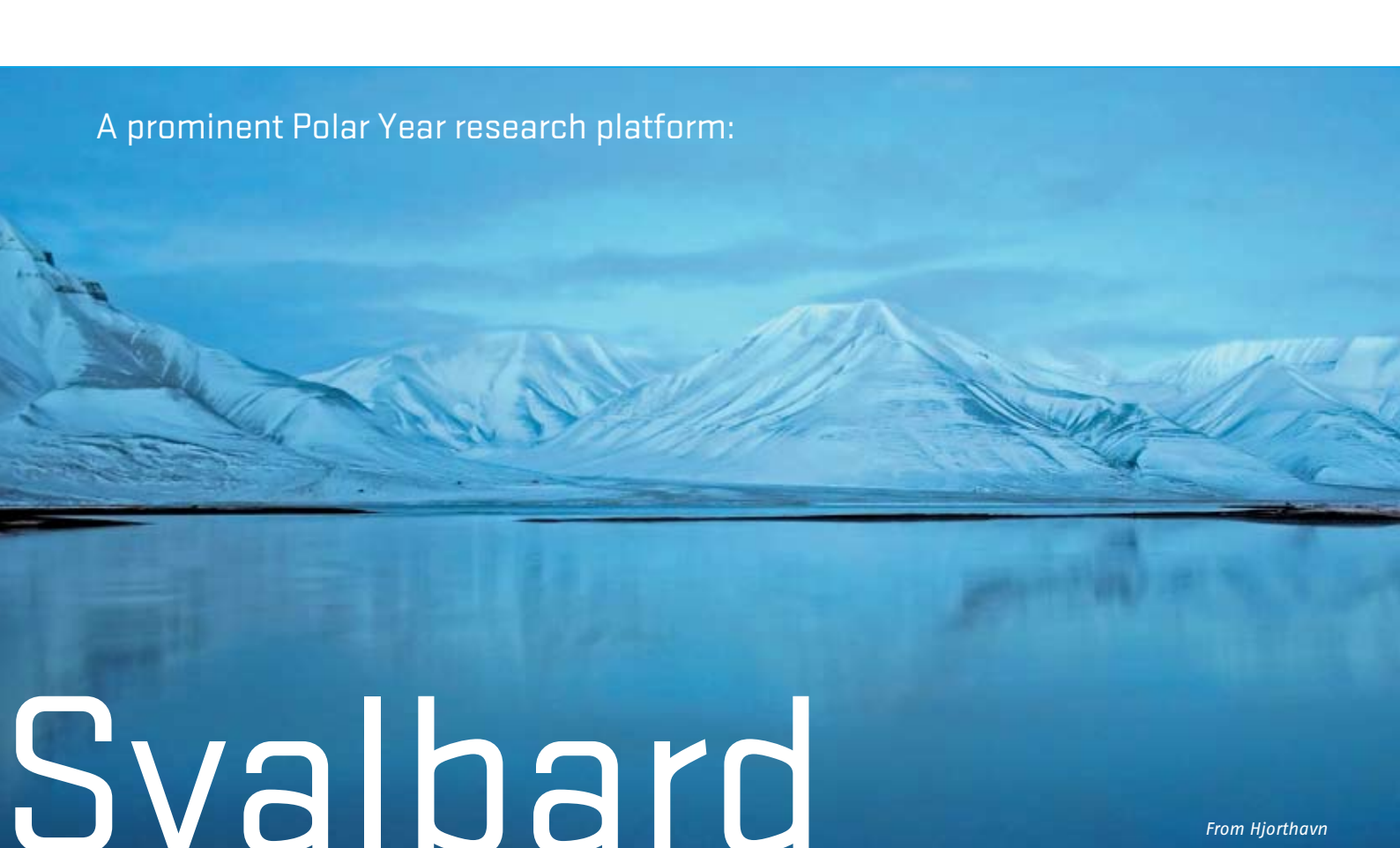
Editorial note

The International Polar Year represents one of the most ambitious coordinated science programmes ever attempted. IPY involves over 200 consortia, with thousands of scientists from over 60 nations examining a wide range of physical, biological and social research topics. The Polar Year is also an unprecedented opportunity to demonstrate, follow, and get involved with, cutting-edge science in real-time.

The Nordic countries are deeply involved in the Polar Year and play significant roles in many of the IPY consortia. The strong tradition for cooperation within the Nordic region also applies to the Polar Year and the multitude of planned activities with Nordic leadership and partnership.

This magazine presents selected highlights from Nordic IPY cooperation.

A prominent Polar Year research platform:



Svalbard

the northernmost gateway to the Arctic

From Hjorthavn

Visitors to Svalbard, the archipelago in the Arctic Ocean, almost unanimously report the same problem. They find themselves hooked on the islands and leave with a strong desire to return. For scientists suffering from this ailment, there is relief. Svalbard will once again play a key role during the International Polar Year (IPY).

Svalbard is surely among the most exotic tourist destinations in Europe, but there is more to the largest island of Spitsbergen than the breathtaking scenery, the magnificent display of colours year round and the remote wilderness.

According to Dr. David Carlson, Director of the IPY International Programme Office, a fascinating environment for nature enthusiasts combines well with the ambitious objectives of the International Polar Year:

– We in IPY think of Svalbard as one of our 'polar gateways', a place where visitors and researchers alike can experience the polar environment and a place from which information about life in polar communities can be communicated to students and teachers in distant, non-polar locations.

Dr Carlson outlines the ambition: To combine groundbreaking research with outreach and educational

activities, and he sees Svalbard as well-suited to serve both aims.

Easy access to the Arctic

– I think that all the researchers who visit Svalbard enjoy the combination of good access, excellent local support, and clean Arctic environment, says Dr. Carlson. He is seconded by Dr. Kim Holmén, Director of Research at the Norwegian Polar Institute.

– In addition to easy access from Tromsø and excellent facilities this far north, Svalbard is an important reference area for scientists in various disciplines and one of the last untouched wilderness areas on Earth, explains Dr. Holmén.

Svalbard is situated about midway between Norway and the North Pole in the area from 76° to 81° North and 10° to 35° East. The largest settlement is Longyearbyen.

When arriving in Longyearbyen, the visitor's first sight is the new Svalbard Science Centre, which opened last year. The building, standing on 390 steel poles buried deep in the permafrost, appears as a copper plated barrage across the valley floor. The centre houses an expansion of the University Centre in Svalbard (UNIS), offices for the Norwegian Polar Institute, a joint logistics department, a range of modern laboratories, the local information centre and the new Svalbard Museum.

A cooperative atmosphere

– Svalbard provides a cooperative atmosphere for both residents and visiting scientists. There are many possibilities for interdisciplinary and international projects. The Norwegian Polar Institute has roots dating back to 1906, and thus the numerous long time series measurements accrued through the years adds quality to research in many fields, says Kim Holmén.

Each year UNIS hosts about 300 students from 20 nations who study and conduct research full-time or attend shorter courses. The university cooperates closely with IPY on a number of research projects as well as through its participation in The University of the Arctic.

Unique research opportunities

– Our knowledge of the polar areas is still limited. Svalbard provides unique opportunities to study some of the most daunting questions still facing natural sciences, says Holmén. The glaciers hold important keys to understanding global historical climate and climate change. Parts of the ecosystem here are highly sensitive to rapid change, and this area is the end station for long-range transported pollutants from Europe, Asia and North America. Svalbard's location at the tail end of the North Atlantic Drift makes it a crucial area for research on thermohaline circulation. The ocean circulation around the archipelago is of major importance for the climate in Europe. In addition the geology covers all main periods through Earth history, is easy to access and provides knowledge about climate variability on long time-scales.

– Climate change itself opens up a new set of opportunities. Recent ice-free periods have already given us invaluable knowledge about what ecosystem consequences a sustained climatic change can imply, he adds.

Over the past decade, Norway has made formidable investments in infrastructure for research in Svalbard.

Norwegian IPY policy calls for efforts to increase foreign researchers' use of Norwegian infrastructure in Svalbard in collaboration with Norwegian research communities.

The northernmost settlement

Ny-Aalesund is situated on Spitsbergen at 79° North and is a company town in which Kings Bay AS, a Norwegian public corporation, manages all facilities and provides all services. The coalmines in the town were closed down permanently after an explosion that took the lives of 21 workers in 1962. Following a surge in scientific activity in the early 1990s, the former coal mining company now delivers infrastructure and logistical services, including full board and lodging.

Each year scientists from at least 15 nations come to Ny-Aalesund to work. Norway, Germany, Great Britain, Italy, Japan, France, South Korea and China have all established their own research stations here. Only 1,200 km from the North Pole, visitors find a modern research centre with high-quality facilities. A modern marine laboratory was added in 2005.

From ground to space

But Svalbard is not all about traditional polar expeditions aimed at collecting ground data. An opening in the Earth's magnetic field just above the islands provides the best spot to access and download data from satellites in polar orbit. During IPY, many space organisations plan to carry out projects that will direct satellites to make observations over the polar areas.

Norway has long been involved in space research and has attained international prominence in fields such as solar physics and sun-Earth interaction, including Aurora research. The EISCAT radar in Adventdalen will operate continuously during the first year of IPY, providing an unprecedented source of measurements, as profiles through the ionosphere.

Photo: Thomas Bjørnflaten / nyebilder.no



Svalbard Science Centre in Longyearbyen

The Norwegian contribution to IPY

Presentation and contact information for all Norwegian IPY projects, calendar of events and activities, and news in English.
www.polaryear.no

Gateway to the Arctic

UNIS offers free ICT services and office space at the Svalbard Science Centre in Longyearbyen to students and researchers involved in IPY projects. UNIS also coordinates logistics.
www.unis.no

Svalbard Science Forum (SSF)

SSF coordinates and provides information about all research activities in Svalbard. The SSF office at the Svalbard Science Centre provides an overview of infrastructure, information about logistics, research bases, application forms for permits and related services.
www.ssf.npolar.no

Ny-Aalesund

For booking of flights, accommodation and other services in Ny-Aalesund, please contact Kings Bay.
www.kingsbay.no



Ice core drilling in Antarctica

Photo: Norwegian Polar Institute

Antarctic traverse in place

Since early last year logistical preparations have been underway for the Norwegian-US Antarctica IPY Traverse. In October the Russian ice-breaker Ivan Papanin loaded more than one thousand tons of equipment and supplies for use in the International Polar Year activities in Antarctica. The cargo included a new power station for the Norwegian research station Troll, equipment for the new K-Sat satellite station and a Belgian expedition, as well as giant sledges, weasels, containers and supplies for the traverse.

The summer season staff at the Troll research station has been busy placing depots along the route that the expedition will follow – from Troll to the Amundsen-Scott South Pole Station – during the 2007-2008 season. In the subsequent season the expedition will take a different route back from the South Pole to Troll. The project is a cooperative effort between the Norwegian Polar Institute and Dartmouth College.

Fieldwork will include the collection of ice cores and firn cores. The ice divide that crosses the interior of East Antarctica contains the Earth's oldest layered ice, as well as long-isolated subglacial lakes and important Earth crustal structures. East Antarctic ice cores thus provide the longest available records of climate and atmospheric parameters.

Significant IPY-funding

Norwegian scientists and research institutions are prepared to play an important role in the International Polar Year. Out of more than 200 international cluster projects endorsed by IPY, about half of these involve Norwegian partners.

The contribution from Norway features a highly diverse academic and professional profile. Most projects will study basic conditions related to the physical and biological environment. Two out of three projects involve climate research.

Altogether 26 research projects have been approved in a national evaluation process and selected to receive Norwegian IPY funding. The Norwegian Storting has allocated NOK 80 million per annum (EUR 10 million) to IPY from the national budget. In addition, the Research Council of Norway has selected another four IPY-endorsed projects to receive funding from other programmes. Some institutions are prepared to allocate additional funding from their own budgets.

About EUR 3 million has been earmarked for education, outreach and communication (EOC).

www.polaryear.no



A curious polar fox outside Ny-Aalesund

Photo: Kristen Ulstein

Heliosphere impact on geospace the science behind auroras

A better understanding of space plasma and solar physics will pave the way for more reliable space weather predictions.

By Dr. Kirsti Kauristie, Finnish Meteorological Institute

During the forthcoming International Polar Year, research groups from 22 different countries will combine forces to study the interaction between near-Earth space (geospace) and the upper atmosphere. Fascinating auroral displays are the most widely known manifestation of these processes. In extreme conditions, during so-called space weather storms, these phenomena can disturb space-borne and ground-based technology, e.g. GPS-based positioning systems, geostationary telecommunication satellites and power transmission networks. The ultimate goal of the IPY-project 'Heliosphere impact on geospace' is to improve our understanding of space plasma and solar physics to such an extent that reliable space weather predictions can be made in a routine manner.

Earth's magnetic field focuses the effects of geospace variations into the Polar Regions. This has catalyzed several research groups into making long-term investments for collecting observations in the Arctic and Antarctic with versatile instrument networks. The IPY-project will build data portals in order to facilitate the usage of these polar data sets, together with satel-

lite data and theoretical models, in interdisciplinary research. This work will result in new information on how the electrically charged and neutral components of the upper atmosphere respond to solar activity. The activity means in this context a continuously varying flow of charged particles and electromagnetic radiation from the Sun resulting from sudden eruptions on the solar surface. With the continuously improving Antarctic measurement infrastructures, scientists now have an unprecedented opportunity to study how the entire planet responds to solar forces and, especially, to investigate asymmetries between the two hemispheres.

Finnish space scientists in the Universities of Helsinki, Oulu, and Turku and in the Finnish Meteorological Institute (FMI) will have an important role in the IPY activities. FMI's position as the coordinator of the IPY-project will help in finding new opportunities to use these talents in multinational collaboration.

*Contact: Senior Researcher Kirsti Kauristie,
kirsti.kauristie@fmi.fi, tel. +358 9 1929 4637*



You can never survive alone

reindeer herders have never been static but are flexible with sensitive resonance – which comes from practical engagement in everyday activities and working within the context of weather extremes and fluctuations.

The main object of this research is to understand in depth the key elements of tacit environmental knowledge and the skills of livelihood, including the concept of various survival systems in harsh, ever-changing climatic conditions. It raises the question of how people gain these skills. We need to focus on two different elements in the process of learning the skills in a tacit way. Firstly, the Sami kinship system of tuning their children into paying attention to their environment in a very trustful way – which could be called in English 'attention to learning'. The second key element considers the flexibility of the exchange systems of Sami and Finnish kinships, from the traditional 'väärttilaitos' friendship system to modern local transformation exchange systems, whereby various innovations, knowledge and practical skills are passed on – 'situated learning'. As the forest people say, 'You can never survive alone, you always need other people'.

By understanding these key elements, they can be defined on the conceptual level and combined with the theoretical discussion of developmental systems theory and ecology of life. The methodology used in this research is called radical empiricism, in which everyday practical experiences and skills will give a context for understanding the human data and ethnography.

This research comes from the Finnish partners as part of the larger CAVIAR project: Community adaptation and vulnerability in Arctic regions.

Contact: Professor Monica Tennberg,
monica.tennberg@ulapland.fi, phone +358 16 341 2793
and Terhi Vuojala-Magga, vuojala-magga@suomi24.fi

By Terhi Vuojala-Magga, Researcher, Arctic Centre

Sami reindeer herders have faced many serious situations in the past 100 years. There have been various disasters in the reindeer population because of difficult and extreme weather conditions – hard snow in late spring, hot summers, and icy ground together with icy snow. In the first half of the 1900's, the people experienced two world wars and eventually the Skolt Sami had to settle on the Finnish side. Then in the 1950's, technological changes in herding management began, with long regional fence systems and the regulation of Lake Inari. Besides all this, people have had to live with the present environmental problems of intensive forestry, soil erosion, and climatic change.

However, people have always adjusted their knowledge and skills within their livelihood in changing contexts. Already at the beginning of the 1990's, the locals had noticed a huge amount of small, fine details of climate change in Lapland, long before any discussion began in the media. The knowledge systems of

Researchers try to understand in depth the key elements of tacit environmental knowledge and the skills of livelihood among Sami reindeer herders.

Kinnvika Takes Off

A major Nordic joint IPY-project, Change and variability of Arctic Systems, Nordaustlandet, Svalbard Kinnvika, is due to begin this spring.

The Kinnvika project is an international and multi-disciplinary joint venture to study the effects of human activity and climate change on high Arctic desert. Nordaustlandet is climatologically special, being harsher than the more southern and western parts of Svalbard, and this is why scientists have a special interest in the area. The scientific field work of the project is starting this spring, and a bigger expedition will take place in August.

Earlier, in September 2005, a Finnish-Swedish-Norwegian group of scientists went to investigate the historic Kinnvika research station, built during the last IPY in 1957. Initially, one idea of the project was partly to renew the station but now it has a purely scientific goal. A feature film about the research will be produced by Matila Röhr Productions Ltd. The research projects get funding from the national academies and the Nordic Council of Ministers supports its logistics.

The Kinnvika project is a co-operative venture led by Sweden and Finland.

Contact: Project Leader Dr. Veijo Pohjola, Uppsala University, veijo.pohjola@geo.uu.se, or Director Paula Kankaanpää, Arctic Centre, University of Lapland, paula.kankaanpaa@ulapland.fi.



Barents on the Web

The web portal Barentsinfo, maintained by the University of Lapland's Arctic Centre, gives access to a huge collection of information on the Barents region. The need for a portal collating Barents-related information had been discussed among the people working on the Barents joint venture for years. The Barents portal came into being through the initiative of the Barents Working Group of Information Technology and was funded by the EU's Interreg Kolarctic programme, 2003-2005.

For the first time, information on Barents business, culture, education & research, environment, funding, indigenous people and tourism can be obtained from the same place. Maps, news, photos, articles and statistics are also available.

In addition to over 3500 links, the portal contains articles and facts about the region. These articles are a valuable source of information about the economy, nature, people and other topics. The Barents photo

album contains over 300 photos from the region.

The portal is maintained and updated by the Arctic Centre Information Service at the University of Lapland.

www.barentsinfo.org

ISCORD 2007

The 8th International Symposium on Cold Region Development ISCORD 2007 will focus on constructed and natural environments. The symposium will take place in Tampere, Finland from in September 25th- 27th with 250-300 participants from more than 14 countries expected. ISCORD is organized by the International Association for Cold Region Development Studies (IACORDS) and the Finnish Association of Civil Engineers RIL, in cooperation with the Finnish National IPY secretariat.

Contact: Helena Soimakallio, helena.soiimakallio@ril.fi, tel: + 358 207 120 602

At the hub of

climate research

Global warming has pushed research into the Greenland ice sheet high up on the international agenda. One among many activities during the International Polar Year is a large international Danish-led ice core project, which is expected to reveal important information about both climate history and current climate change.



Photos: the Ice and Climate Group

Ice cores are cylinders of ice with a diameter of 10cm, which are drilled out of the ice caps and brought up in 3 metre long sections. They contain information about climate in the past.

Greenland should prepare itself for a sizeable invasion during the International Polar Year (IPY) in 2007 and 2008. No less than 100 of 220 international research consortia are connected with research in Greenland, and at least 300 Danish and Greenlandic researchers are deeply involved in 80 of these projects. In addition, there are Danish researchers at the head of 24 of the international research consortia in the Greenland section of the IPY.

For the head of the Danish IPY committee, Professor Dorthe Dahl-Jensen from the Ice and Climate Group at the Niels Bohr Institute in Copenhagen, the great interest comes as no surprise:

– Research in and around Greenland has seldom been as relevant or as necessary as it is now. Climate

change is having its greatest impact in the high-Arctic areas and the changes taking place here will influence conditions right across the globe. A climatic warming will result in a reduction in the volume of the inland ice sheet, which in turn will cause rises in ocean levels, altered ecosystems and changes in the permafrost regions. All of these changed circumstances will mean changes in living conditions for humans, animals and plant life.

The hunt for old ice

As the leader of a new ice-core drilling in the northern part of the Greenland ice sheet, Dorthe Dahl-Jensen has a big role in one of the larger, international, Danish-led projects in Greenland.

The ice-core drillings so far, in 1990–92 and 1999–2003, have given some sensational and ground-breaking knowledge on climate trends going back more than 100,000 years. But we are still missing a core which covers the whole of the earlier interglacial era – the Eemian era – which extended from 130,000 to 110,000 years ago. The NorthGrip ice core from 1999–2003 covers the transition from the interglacial era up to the last ice-age 115,000 years ago, but it only contained half of the Eemian era because the bottom had melted away.

This was a major upset to the calculations of ice-core researchers who had counted on discovering ice from the whole of the previous interglacial era. A new ice core covering the entire Eemian era is thus very high on the wish-list of the ice-core community.

– We find ourselves right now in an interglacial era and discussions are ongoing around when the next ice age will arrive. This is a difficult question to answer, but greater insight into the climate of the previous interglacial era would certainly assist us in our understanding of our own interglacial era and the current climate, says Dorthe Dahl-Jensen. In addition, it is a period which we hope can give us important information about connections between north and south, which we suspect play an active role in relation to the



Foto: The Ice and Climate Group

The drilltrench at the NorthGrip-drilling in 2004.

fundamental climate changes which occur between ice ages and interglacial eras.

So now there is a desire for a fresh attempt, this time in a northern area 300 kilometres north of the NorthGrip drilling and a couple of hundred kilometres east of Thule. Radio-echo soundings from aircraft have shown that there would be good possibilities here for the ice-core drilling, at a depth of approx. 2,500 – 2,600 metres, to be able to reach ice which is more than 130,000 years old and thereby obtain an ice core that would cover the entire previous interglacial period.

International support

The project, known by the acronym Neem (North-Eemian), has received broad international support among ice core researchers and it was decided in meetings at IPICS, the international forum for ice core researchers, that this should be the most highly-prioritised drilling in the northern hemisphere.

Interest in taking part has been high and there will be participation from several of the most prominent polar research nations, such as the USA, Canada, Germany, Sweden and France. Several countries have also held out the prospect of making a financial contribution to the project, which has a total budget of Dkr. 45mil (€6mil). There is, besides, a fruitful spirit of international cooperation among ice-core researchers and, apart from the deep drilling in Greenland, there are also plans for drilling in Antarctica and a number of local bores along the ice margins in both regions.

*Contact: Dorte Dahl-Jensen, Ice and Climate Group,
Niels Bohr Institute, University of Copenhagen, ddj@gfy.ku.dk, tel. +45 3532 0556*

Ice cores

Ice cores are cylinders of ice with a diameter of 10cm, which are drilled out of the ice caps and brought up in 3 metre long sections. During snowfall, the snow has collected particles from the atmosphere and during compression from snow to ice, the atmospheric vapour between snow particles is trapped in bubbles in the ice. Analysis of the chemical composition and physical properties of the ice cores, as well as of the ancient atmospheric vapour, shows how the Earth's climate has varied going back across the ages.

The long, long season

The high-Arctic Zackenberg research station has been operated by the Danish Polar Center as a spring-autumn station for the past 12 years, accommodating a multinational mix of scientists for 90 days a year. In Zackenberg valley and the adjacent coastal waters, a multitude of ecosystem elements are monitored and studied in order to improve understanding of how an undisturbed high-Arctic ecosystem behaves under natural conditions.

To provide a solid background for the short-term science projects, a long-term ecosystem monitoring programme, Zackenberg Basic, distils data from land, air, freshwater and marine environments. This programme has gained worldwide recognition as the most thorough and extensive ecosystem monitoring in the Arctic and has become a real trail-blazer for similar initiatives in other regions.

The International Polar Year has spawned increased interest among scientists in extending their field studies and monitoring from summer to well into, or all the way through, the longest season of the year: nine months of genuine, old-fashioned winter.

During the coming IPY 2007 season, Zackenberg will open as usual in late May. In September, when winter starts again, the station will continue to host IPY activities all through the Polar night and carry on through the spring and summer of 2008.

[Read more at www.zackenberg.dk](http://www.zackenberg.dk)

Photo: Henning Thing, DPC



On Thinner Ice

There is massive Nordic participation in the extensive EU project DAMOCLES, in which 11 large research projects will analyse climate change and its consequences in the Arctic Ocean. 19 Nordic institutions are collaborating in all aspects with partners from 12 European countries.

At the beginning of September 2006, the French schooner Tara anchored up in the Arctic pack ice at 80°N, where it quickly became trapped in the tight grip of the ice mass. It will remain here for at least a couple of years before it can again break free of the ice and sail on under its own power.

A journey into the ice

But what on the surface looks like a risky and dangerous situation is in reality the beginning of a well-organised, comprehensive European research expedition.

Over the next couple of years, Tara will drift approx. 1,800 kilometres with the pack ice from the East Siberian Sea over the North Pole to the Fram Strait between Northeast Greenland and Svalbard. It is here that the ship will first melt free from its captivity. En route, Tara will act as a roof over the head for a floating research station, which will measure and survey oceanographic, meteorological and glaciological conditions in the sea ice around the North Pole in order better to understand the interaction between ice, sea and atmosphere.

The expedition is well underway and there are no indications that the planned interaction with the natural forces can go wrong. The researchers have a lot of knowledge about the movements of the pack ice in the Arctic Ocean. Neither is the idea of allowing a ship to be frozen into the ice and let it drift with the so-called transpolar ice-drift a new one. It was first attempted by Fridtjof Nansen on the Fram expedition in 1893–96 and later used by Russian drift-ice stations in the 1930s.

Reduced sea-ice cover

The expedition is part of a large EU project, DAMOCLES (Developing Arctic Modelling and Observing Capabilities for Long-term Environmental Studies – Integrated Project), which is the largest-ever European Arctic research project and has been initiated in connection with the International Polar Year. The budget is €16 million and, in all, 45 scientific institutions from 12 European

countries are taking part, including 19 Nordic research institutions. The programme activities are taking place in collaboration with the USA, Canada and Japan. There will be a lot of activities within meteorology, glaciology and oceanography, and the project will cover sea-ice, snow and glaciers. Over and above the 11 research projects on Tara, the DAMOCLES programme consists of satellite measurements and collating of information from different ice camps and research ships.

The background to this large effort is the especially large climate changes that are taking place at present the Arctic region. The Arctic over the last 2–3 decades has warmed more than other regions of the world, and the sea-ice cover has decreased significantly in the same period. A first-order scientific and societal question is whether the Arctic perennial sea-ice will disappear in a few decades (or even faster, as predicted by some state-of-art climate models). DAMOCLES is specifically concerned with the potential for a significantly reduced sea-ice cover, and the impacts this might have on the environment and on human activities, both regionally and globally. The changing Arctic climate is having and will have a wide range of impacts, also on human activities, such as fisheries, shipping, offshore oil and gas production at regional, national and local levels. Through its regional, multidisciplinary approach, DAMOCLES will provide a broad perspective for decision-makers and stakeholders to consider future policies for adaptation.

At the same time, there is substantial agreement between climate researchers that the widespread climate changes in the Arctic are sending a warning about, and will have an influence on, future global climate change. But we lack the necessary knowledge to be able to express ourselves with more certainty on the interaction between climate in the Arctic Ocean and the global climate, so an important goal with the DAMOCLES activities is to collect data and develop models in this area too.





Over the next couple of years, Tara will drift approx. 1,800 kilometres with the pack ice from the East Siberian Sea over the North Pole to the Fram Strait between Northeast Greenland and Svalbard. En route researchers will measure and survey oceanographic, meteorological and glaciological conditions in the sea ice around the North Pole.

Massive Nordic participation

DAMOCLES brings together most European experts on polar research and a broad range of environmental modellers through an integrated research effort.

Even if it is a case of a European cooperative project, DAMOCLES is at the same time one of the programmes during the International Polar Year which has the largest content of Nordic research collaboration. The project has a huge Nordic participation, in that around half of the participating research institutions come from Norway, Finland, Sweden and Denmark.

Examples among the many institutions taking part are the meteorological institutes from the four countries, all of whom are involved in work on defining an observation system for the Arctic. This is a question of both long timescales, which mirror long-range climate change, and short timescales, which are necessary to monitor weather, sea and ice conditions from day to day.

Thus, there is cooperation between the Norwegian and the Swedish institutes in developing regional climate models. There is further cooperation between the Danish and the Finnish meteorological institutes which, together with the Danish National Space Center, are taking part in the snow and ice measurement programme on Tara. In addition, the Norwegian and Danish institutes have been given responsibility for developing the database system for the entire project.

Activities in connection with DAMOCLES will certainly produce a stream of results going forward – results which will give us greater knowledge about the Arctic region and the consequences of climate change for mankind and for the environment.

Contact: Project co-leader Cecilie Mauritzen, Norwegian Meteorological Institute, cecilie.mauritzen@met.no, tel. +47 22 96 31 86, and project co-leader Ralf Döscher, Swedish Meteorological and Hydrological Institute (SMHI), ralf.doescher@smhi.se, tel. +46 114 95 85 83

Swedish ice breaker Oden during the operations in Antarctica in 2006/07.

Activities up and down

By the Swedish Polar Research Secretariat

The Swedish participation in IPY involves about 150 Swedish scientists in nearly 80 research projects in the Arctic and the Antarctic. The Swedish Polar Research Secretariat will operate and coordinate several of these research projects by providing infrastructure, research facilities and, in some cases, expedition management.

The Secretariat has a long-term contract with the Swedish Maritime Administration for using the ice-breaker Oden for scientific purposes. Oden is internationally renowned as a research platform; it has a unique combination of modern research facilities and excellent ice breaking capacity.

Oden in the Arctic Ocean

During the Arctic season 2007, the research on board the ice-breaker Oden will focus on marine geology and oceanography in the nearly inaccessible and unexplored areas in the Arctic Ocean northeast of Greenland. The expedition, with the working title LOMROG (Lomonosov Ridge off Greenland), is a cooperative venture between Swedish and Danish scientists. The ice-breaker Oden will during the spring of 2007 become equipped with a

multi-beam echo-sounder which can give 3D images of the sea floor.

The marine geology project, a part of the international research programme APEX (Arctic Palaeoclimate and its Extremes), will try to expand the understanding of the role of the Arctic in the global climate system. With samples taken by a sediment corer together with a CTD for water sampling, the scientists can get integrated knowledge of the sea floor of the Arctic Ocean. On board, the marine geology team will work in close collaboration with an oceanographic research project in order to get a deeper understanding of the glacial and climate history by studying the currents and sea water flow as well as sediment erosion along the continental shelf.

During the latest Antarctic season, the ice-breaker Oden broke the ice in the southern polar region for the

Ice breaker Oden with its multibeam will be able to cover big parts of the sea floor and present the findings in 3D images.

first time ever. The expedition Oden Southern Ocean was a mission from the US National Science Foundation (NSF) which needed assistance with ice-breaking at the McMurdo station by the Ross Sea. During the transit from South America to McMurdo, Oden served as the research platform for a multinational team of marine chemists and marine mammal zoologists. The expedition was a success and the scientific cooperation between Sweden, Chile and the USA will hopefully continue for the upcoming Antarctic IPY seasons as well.

For the Arctic season of 2008 the icebreaker Oden will serve as a platform for research projects within atmospheric chemistry and meteorology.

Collection of data

The Swedish research stations Wasa and Svea in Dronning Maud Land, Antarctica, serve as focal points for continuous monitoring of climate and weather data and geodetic and atmospheric physics research programmes. During the 2007/08 Antarctic season, scientists from Sweden and Japan will carry out glaciological climate research during a 3,000 km tracked vehicle traverse over the continent by sampling and monitoring the Antarctic ice sheet along the way. Four vehicles will start from Wasa and three vehicles from the Japanese research station Syowa. They will meet halfway to exchange scientific equipment and researchers between the convoys, then travel back to their respective stations.

Another Swedish part of the international and Nordic IPY infrastructure is the continued measuring and observation performed from the ground based Zeppelin station in Ny-Ålesund. The station is owned and operated by the Norwegian Polar Institute. The scientific programme is run by the Norwegian Institute for Air Research (NILU), in close cooperation with the Department of Applied Environmental Science at Stockholm University (SU).

The measurements performed by SU at the Zeppelin station include carbon dioxide concentration, particle concentration and size distribution and light absorption and scattering. Complementary airborne measurements have also been performed (ASTAR, Arctic Study of Tropospheric Aerosols, Clouds and Radiation) and, during the Antarctic season of 2006/07, a sister campaign in Antarctica (ANTSYO II/AGAMES) has recently begun in cooperation with AWI Bremerhaven, with the aim that the bipolar research results will complement each other. More information on the Zeppelin station can be found on www.itm.su.se/zeppelin.

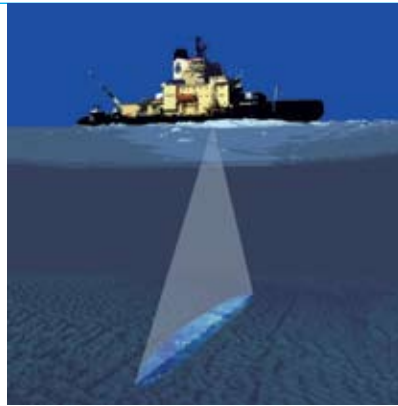


Photo: Martin Jakobsson

Nordic cooperation at Kinnvika

During the Arctic spring and summer seasons of IPY, a multinational research group will work at Kinnvika, on Nordaustlandet, Svalbard. The Kinnvika station was originally built in 1957 to be used for glaciology studies during the International Geophysical Year, and it comprises nine wooden buildings. Parts of the station are considered as historic listed buildings, under the auspices of the Governor of Svalbard.

The Kinnvika IPY project aims to provide a terrestrial platform and a gateway for scientific fieldwork in the High Arctic and to strengthen research collaboration between the Nordic countries. Nordaustlandet is the northernmost land on Earth and is therefore of significant importance for monitoring changes and variability of the sensitive and changing Arctic Ocean systems. The ambitious scientific programme includes projects within glaciology, meteorology, geology, ecology, archaeology and more. The Swedish Polar Research Secretariat will provide logistical support to the field projects.

www.kinnvika.net www.polar.se

Contact: Eva Grönlund, Swedish Polar Research Secretariat,
eva.gronlund@polar.se, tel. +46 8 673 97 30



Photo: Johan Ström

Industry in the polar areas

Global warming might open the Arctic up for new industrial activity. A new project will study how we have dealt with the issue in the past.

The circumpolar north has become increasingly important as an area for the supply of fossil-fuel energy, partly as a result of rising world market prices for crude oil and partly because of the possibilities for extraction and transport in the high north that global warming might offer. In the wake of this development, attempts have been made by states to establish exclusive rights to natural resources in the Arctic.

This development is also the starting point for the LASHIPA project (Large Scale Industrial Exploitation of Polar Areas) – an IPY project joining researchers and doctoral students in Sweden, Norway, Russia, the USA, Great Britain and the Netherlands. From an international comparative perspective, the LASHIPA project will study how actors have dealt with natural resources, territorial rights and environmental issues in the Polar Regions in the past, providing new knowledge of potential importance to policy and decision makers.

LASHIPA is financed by national research councils and other funding agencies, as well as by universities and institutes in the participating countries. It is multidisciplinary, with a centre of gravity in the disciplines of History and Archaeology. The aim of the project is to explain the development of industry in the polar areas from the 17th century until today and to analyse its consequences for geo-political development, the environment and indigenous peoples.

On the macro level, LASHIPA will seek out the driving forces – scientific, economical, political and cultural – behind industrial development in the polar areas. On the micro level, focus is on the strategies of companies in adapting to the political, social and natural conditions of the polar areas – technology transfer, the design of technology and industrial communities, and the social organisation of production. In this connection, it will study the local consequences of whaling, hunting, coal mining and oil extraction for the environment and indigenous peoples. Finally, major attention will be devoted to the struggle for control over natural resources and its geo-political consequences.

Some of these research questions require field studies in the Arctic and Antarctic – archaeological field work and interviews with actors. Whaling stations will be investigated on South Georgia and Deception Island in the Austral region and the Antarctic. In the Arctic, field studies will be made at whaling stations and mining settlements in Svalbard, the Barents region, Greenland and Alaska. The projected outcomes are databases, articles in scientific journals and a multi-volume book – and hopefully a new understanding of the risks and possibilities in future industrial ventures in the Polar Regions.

www.lashipa.nl

www.ipy.org/development/eoi/proposal-details.php?id=10

Contact: Dr. Dag Avango, Royal Institute of Technology, Stockholm,
avango@kth.se, tel. + 46 87908737

Camp Morton, Van Mijenfjorden, Svalbard. A British colliery from the early 1900

The Endangered Bear

The polar bear is under dual attack, threatened by both climate change and environmental pollution.

The polar bear is the Arctic colossus which we, with a shiver and in awe, regard as invulnerable. That notwithstanding, it today faces such comprehensive dangers that it has appeared on wild-life protection organisations' lists of the world's endangered species.

At the top of the list of dangers stands climate change, which during the coming 50–100 years could dramatically remove large areas of the Arctic pack ice which is the polar bear's habitat and hunting ground. It is expected that climate change alone will reduce the polar bear population by at least 30% over the next ca. 50 years – or three bear generations.

To this should be added a longer list of other disruptions and threats, such as hunting, pollution from environmental poisons borne in from afar, exploration for, and extraction of, oil and gas, shipping and tourism. Investigations of the consequences of climate change and environmental pollution for the polar bear have come in a steady stream in recent years. During the International Polar Year, polar bear researchers from Canada, Norway, the USA, Denmark and Greenland, in a Danish-led consortium, will join forces on a circumpolar polar bear project which will standardise data collection and ensure comparable investigations and analyses for the bear population as a whole.

While the impact of familiar environmental pollutants such as PCB's is shrinking, the concentration of new pollutants – the organohalogen compounds (OHC's) – in the Arctic marine food chain is on the rise.

Photo: Samfoto



Global warming threatens the polar bear's natural hunting ground.

The researchers will also be looking more closely at connections between climate change and environmental pollution. Global warming threatens the polar bear's natural hunting ground and the increasing impact of pollutants amplifies still further this pressure on their existential imperatives, because they undermine the health of the weakest and thereby increase the threat to the bears. One aspect of the studies will be clarification of how the disappearing ice pack influences the distribution of polar bears in East Greenland. A Greenlandic-led study is following the animals' movements over several years with the help of satellite transmitters attached to bears captured on the East Greenland pack ice.

www.dmu.dk

Contact: Christian Sonne, National Environmental Research Institute, csh@dmu.dk

The Sixth International Congress of Arctic Social Sciences, ICASS VI

The Sixth International Congress of Arctic Social Sciences will take place in Nuuk, Greenland, 25–29 August 2008. The congress will offer various venues for IPY scholars, other northern researchers, and local participants to analyse the progress of IPY 2007–2008 in social, human, and related fields. This includes special project sessions, discussion panels, plenary presentations, invited talks by leading IPY scientists and representatives of the indigenous peoples of the Arctic and public meetings. Sessions and panels at the congress will be framed around major IPY research fields and initiatives, with broad international and interdisciplinary participation. For many international network projects, congress sessions will offer the only chance for face-to-face discussions, as participants from many countries and regions may have limited contacts in the field and across boundaries.

www.iassa.gl

Contact: Birger Poppel, University of Greenland, bipo@ililismatusarfik.gl, tel. +299 32 45 66

Greenland - an active partner

Since the introduction of home rule in 1979, Greenland has built its own research institutions. Greenlandic researchers thus participate actively in the International Polar Year in a range of international projects.

In recent years, Greenland has played a central role in international research as Greenland and the surrounding seas open unique possibilities for exploring processes of global significance. This increased focus is not least due to the fact that the impact of climate change is initially experienced in the Arctic. It is also a fact that not only the glaciers are affected. Human existence, the living conditions of the indigenous peoples and other Arctic inhabitants, traditional ways of living, as well as mixed cash and subsistence economies, are impacted. At the same time, new possibilities for economic development within the fields of renewable and, not least, non-renewable resources emerge.

From being an interesting field for researchers mainly from outside Greenland, Greenland has, since Home Rule was established in 1979, built its own research institutions. To a still larger extent, Greenland has become an initiator of, and a partner in, Greenlandic as well as international research projects within different scientific disciplines, focussing primarily on 'man, nature and Arctic societies'. The short project descriptions below reflect the increasing number of Greenlandic research activities and research partnerships, of which some were developed at the Nordic IPY seminar in Ilulissat, Greenland, April 2005.

Long-term Perspectives on Movement and Communication

The main activities at the Greenland National Museum, NKA, during the International Polar Year are going to be carried out as parts of the project which is designed to study key-concepts of movement, communication and strategies among Arctic people. The concept of movement refers to human actions, understood as seasonal mobility and long-term migrations, and as movement of resources and material culture through trade and exchange in space and time. The concept of communication includes network studies involving economic, social, and

ideological choices. The concept of strategies focuses on Arctic peoples' interaction within their social, cultural, and natural environments, stressing the multiple levels formed by individual agents, families or households, local groups, and in particular, connections between these levels.

*Contact: Claus Andreassen, Greenland National Museum,
claus.andreassen@natmus.gl, tel. +299 32 26 11*

Glocalisation

The project is exploring the indigenous forms of expression across Arctic communities. The impact of global cultural trends is seen as partly opposed by local tendencies, - i.e. glocalisation. But how exactly does glocalisation take place? How much impact does local cultural, media and language policy have on the development? Who are the decision-makers, formally as well as informally? 29 researchers are involved in the project which will cover sociolinguistics, applied linguistics, literature and media through four sub-projects: Language Policy and Language Planning; Computer Assisted Linguistics; From Oral Tradition to Rap and Citizenship; Consumerism and Media.

www.ilisimatusarfik.gl/Default.aspx?tabid=148.

*Contact: Karen Langgaard, University of Greenland,
kala@ilisimatusarfik.gl, tel. +299 32 45 66*

Political Economy of Northern Development

The purpose of the project is to perform a comparative analysis of the structure and functioning of Arctic regional economies, putting an emphasis on the regional dependence of economic centres. The project is based on an analytical model containing three approaches to analysis:

- Globalisation involves analysis of trade, competitiveness and productivity
- Internal systemic differences put comparative system analysis on the agenda
- Structural change within the regions, taking the form of urbanisation, subsistence economy and centralisation/decentralisation issues, is of importance.

The research question aims at analysis regarding constraints and potentials regarding the three approaches in relation to interdependence and self-reliance.

Contact: Gorm Winther, Aalborg University, gowi@stofanet.dk

Survey of Living Conditions in the Arctic

The intent of the Survey of Living Conditions in the Arctic (SLiCA) is threefold: to develop a new way of measuring living conditions that is relevant to people in the Arctic; to compare living conditions among Inuit people of the Arctic; and to better understand the relationships within their living conditions. There are two phases to the analysis. The first phase involves the work of the project team itself. The second phase is to facilitate the work of the broader research and policy analysis communities by making the data available. The SLiCA data file consists of over 7,000 interviews, a representative sample of indigenous adults living in Inuit settlement regions in Alaska, Canada, Greenland, and Russia. Building on the concepts of remote access analysis, the international SLiCA project team will provide researchers and policy analysts with the capability of applying a full array of statistical analysis techniques to the dataset while ensuring that the individual records remain unseen.

www.arcticdivingconditions.com

Contact: Birger Poppel, University of Greenland, bipo@ilisimatusarfik.gl, tel. +299 32 45 66

EcoGreen – one of the lead clusters in IPY

The consequences of global climate change are already evident in the Arctic today. The prognosis is a warming Arctic where the temperature will increase by 2-4°C during this century and Greenland must be prepared for the impact of these dramatic changes. The Greenland Institute of Natural Resources has therefore initiated a programme called EcoGreen, which integrates studies of the structure and function of the West Greenland marine ecosystem. The programme has been approved as one of the lead clusters by the international steering committee of the International Polar Year. 15 worldwide research institutions from 6 different countries are involved in the programme. Rapid climate shifts and the low level of complexity make the West Greenland marine ecosystem uniquely suited for the study of the effects of climate change. At the same time, the situation, with an ecosystem located inside a single economic zone, provides excellent opportunities for studies of interactions between ecology and society. Together, these factors make West Greenland a study area of international interest by providing insights into the effects and interactions between mankind, climate and ecosystem.

Contact: Torkel Gissel Nielsen, National Environmental Research Institute, tgn@dmu.dk, tel. +45 4630 1257

or Søren Rysgaard, Greenland Institute of Natural Resources, rysgaard@natur.gl, tel. + 299 36 12 00

Photo: Magnus Elander



A Brief History of IPY

On three occasions over the past 125 years, scientists from around the world have come together to organize concentrated scientific and exploration programmes in the Polar Regions. Each polar year was a hallmark of international cooperation in science and extended our understanding of the many geophysical phenomena that influence nature's global systems. The experience acquired by scientists and governments in international cooperation also paved the way for several political accords. IPY 2007–2008 will expand upon this legacy of scientific achievement and societal benefits.

First International Polar Year (1882–1883):

The first IPY was inspired by the Austrian explorer Karl Weyprecht, who became aware that solutions to the fundamental problems of meteorology and geophysics were most likely to be found near the Earth's poles. The key concept of the first IPY was that geophysical phenomena could not be surveyed by one nation alone. Altogether 12 nations participated and, beyond the advances to science and geographical exploration, a principal legacy of the first IPY was in setting a precedent for international science cooperation.

Second International Polar Year (1932–1933):

The International Meteorological Organization proposed and promoted the second IPY (1932–1933) as an effort to investigate the global implications of the newly discovered 'Jet Stream'. The second IPY heralded advances in meteorology, magnetism, atmospheric science, and in the 'mapping' of ionospheric phenomena, which advanced radio science and technology. Forty permanent observation stations were established in the Arctic, creating a gradual expansion in ongoing scientific Arctic research. Stations were also operated in the Antarctic. A total of 40 nations participated, even though the IPY coincided with the economic depression.

The International Geophysical Year (1957–58):

The IGY's research, discoveries, and vast array of synoptic observations revised or 'rewrote' many notions about the Earth's geophysics. One long disputed theory – continental drift – was confirmed. The world's first satellites were launched, which led to the discovery of the Van Allen Radiation Belt encircling the Earth. Geophysical traverses over the Antarctic ice-cap yielded the first informed estimates of the total size of Antarctica's ice mass. A notable political result with its foundations in the IGY was the ratification in 1961 of the Antarctic Treaty, which dedicated the continent to peace and science and ensured the protection of its environment for coming generations.

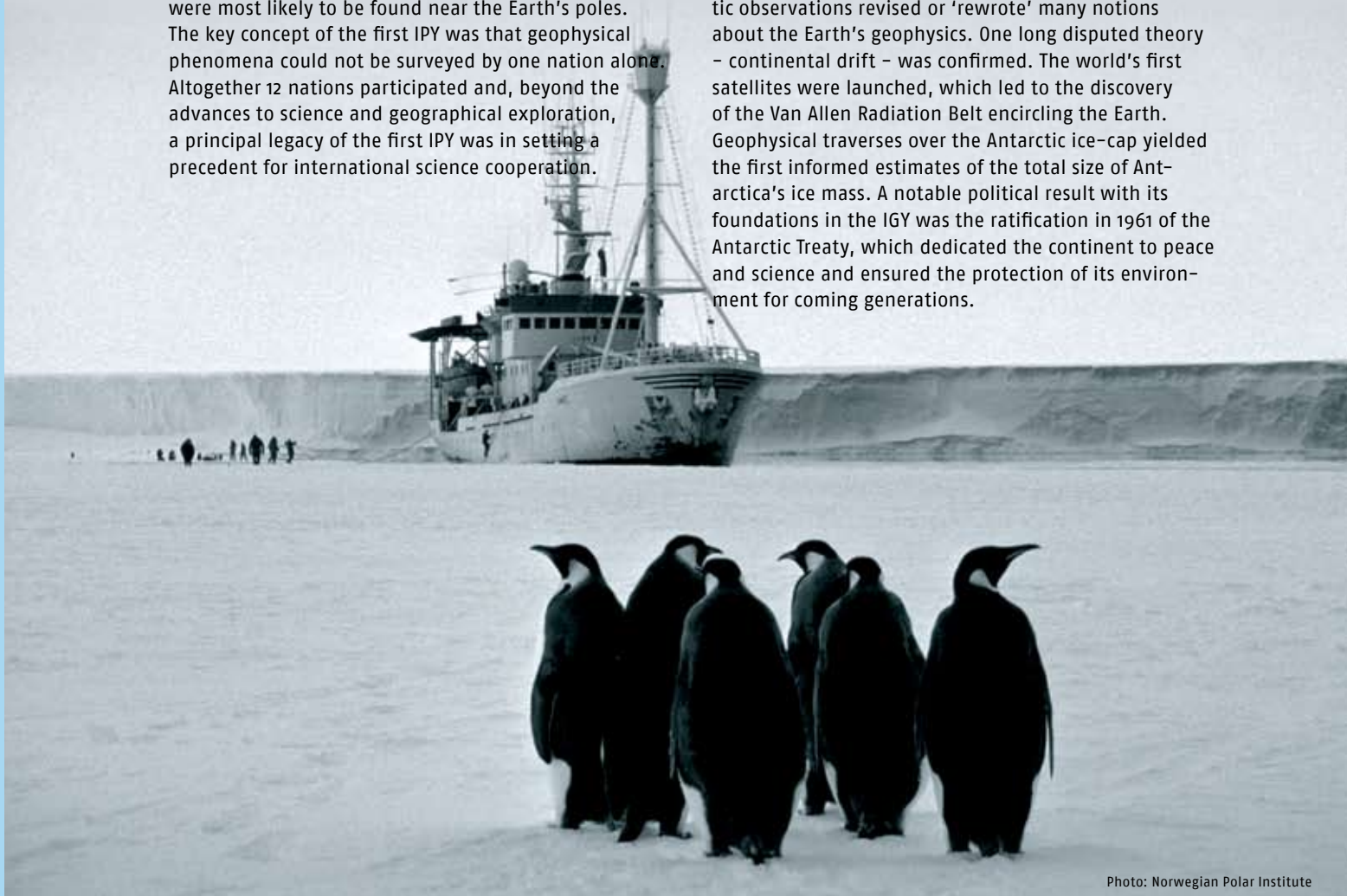


Photo: Norwegian Polar Institute



FINLAND PROMOTES NORDIC POLICY OF ENVIRONMENTAL PROTECTION

The Finnish Presidency of the Nordic Council of Ministers in 2007 is, among other things, determined to improve the capacity of the Nordic Region to meet global challenges.

As far as the EU's Northern Dimension is concerned, attention will be focused on the challenges faced in the environmental sector. The Northern Dimension is making great strides forward and the various regional bodies in northern Europe are also working ever more closely together and dividing responsibilities between them in an ever more sensible manner.

The Presidency will also advocate the Nordic perspective in the international debate on climate change, with due regard to established practice in energy co-operation.

Finland will promote a Nordic policy of environmental protection that takes into account opinions from various sectors. During the Presidency, the environment policy's priorities will be determined by the Nordic Council of Ministers' environment programme for 2005-2008. As the programme is implemented, co-operation that transcends individual administrative sectors will be emphasised.

Finland will also take account of the Council of Ministers' action plan for the Arctic, and the environment sector's Arctic strategy. Nordic methods of affecting and adapting to climate change and the Arctic Council's

Arctic Climate Impact Assessment (ACIA) will also be taken into consideration. Nordic Cooperation and the Northern Dimension are complementary and mutually reinforcing. The Nordic Countries operate right out of the heart of the Northern Dimension, in the EU, in each of the four Regional Councils (BEAC, NCM, CBSS, AC), bilaterally and between themselves, neighbouring countries, the United States and Canada. The Nordic Countries can make a great contribution to developing and strengthening the Northern Dimension; they open up their expertise on a cold climate, a sparse population, resources, differences, opportunities and challenges for everyone's use without forgetting their common denominator: their proximity to Russia.

The Nordic Cooperation and the Northern Dimension both have a wide scope and many dimensions, concrete projects and financing. Cooperation under the Northern Dimension is inclusive. Under this umbrella concept, Baltic Sea cooperation, the issues of the Far North and those of north-western Russia are not challenged. Focus on one does not diminish the other.

Systematic cooperation between Governments and down-to-earth approaches with new ideas and projects are also needed as well as the involvement of non-governmental organisations and people-to-people contacts.

*Mr Stefan Wallin
The Finnish Minister for Nordic Cooperation*

Nordic Council of Ministers - Arctic Cooperation

The Nordic Council of Ministers (NCM) is extensively involved in the Arctic. The Nordic engagement in the Arctic Region is primarily managed through an Arctic Cooperation Programme. During 2006-08, the NCM will focus on the living conditions of indigenous peoples, Nordic research with a special view to the International Polar Year, and climate change and environmental pollutants in the Arctic. The annual budget for the Nordic Arctic Cooperation Programme is approx. €1 Million.

NCM Arctic Cooperation Programmes are based on 3-year periods and started in 1996. The current programme covers the period 2006-2008. The framework for the activities is broad in scope and includes such fields as environmental protection, health, research, culture, education, economic development and indigenous peoples.

The Arctic Cooperation Programme is used by the NCM for cooperation purposes vis-à-vis other regional councils, in particular the Arctic Council, the Barents Euro-Arctic Council and the EU. Furthermore, the programme also supplements the NCM's Programme for Northwest Russia which in geographical terms covers parts of the same area.

Objectives

The Nordic Council of Ministers' overall objectives for activities in the Arctic include the development and improvement of the quality of life for the population of the Arctic by protecting the environment and improving conditions for business and industry. The NCM will also contribute to and support the social and cultural development of the Arctic population. Sustainable use of the resources in the region and conserving Arctic nature and biological diversity are other important objectives. Finally, the Nordic countries will follow up on existing knowledge on environment pollutants, heavy metals and climate change as well as their impact on human and animal living conditions in the Arctic.

During the current programme period from 2006-08, the NCM is focusing on three main fields of activity, namely: i) Promoting the living conditions of indigenous peoples and their opportunities for improving their economic and cultural conditions; ii) Improving the conditions for Nordic research with a special view to the International Polar Year 2007-2008; and iii) Improving the conditions for Nordic cooperation on climate change in the Arctic, and acting to prevent the proliferation of environmental pollutants in the Arctic.

NCM Arctic Expert Committee

Nordic activities in the Arctic are coordinated by an Arctic Expert Committee (AEC). The members of the AEC include the Senior Arctic Officials (SAO's), the permanent Nordic representatives in the Arctic Council. The self-governing areas are also represented on the Committee. Through the members' involvement in regional organisations covering the Arctic Region, the AEC has the necessary overview of the policies and activities taking place in the Arctic, and is therefore able to give the NCM valuable advice.

The main task of the AEC is to assist and advise the NCM with information and knowledge on national, bilateral and multilateral projects and activities in the Arctic. The AEC takes part in the preparations for, and follow-up to, the Arctic Cooperation Programmes, as well as advising the Nordic Cooperation Committee on concrete project applications relating to the initiatives of the NCM in the Arctic.



Photo: NCM

Budget

The annual budget for the Nordic Arctic Cooperation Programme is approx. €1 Million. Nordic funding contributions are also extended to Arctic activities from many of the 10 Nordic sector Councils of Ministers which initiate additional projects in the Arctic areas. The aggregated financial allocations from the sector Councils are in the same order of magnitude as that of the Arctic Cooperation Programme, thus ensuring a significant Nordic level of activity in the Arctic.

Arctic evaluation

The NCM constantly strives to improve its work and partnerships, and in order for the NCM to increase its effectiveness and ensure that it adheres to the objectives and policies set out by the Nordic Ministers, the Arctic Cooperation Programme from 2003-05 was recently evaluated. The report was positive and very constructive with regard to the Nordic activities in the Arctic. The evaluation report and its recommendations are now being considered in the NCM. The report will hopefully serve to improve the effectiveness of NCM work with Arctic issues.

NCM Russia Programme

The NCM has, in addition to the Arctic Cooperation Programme, a special Russia Programme which consolidates the guidelines for co-operation with Northwest Russia. Two separate sub-programmes have been developed, namely a program for mobility and network activities

with a budget of approx. €3 million in 2007, and an NGO-programme with a budget of approx. €0.7 million in 2007.

Coming activities

The Nordic Council of Ministers has in January 2007 decided to support 22 new Arctic projects under the Arctic Cooperation Programme, many of which are relevant to the International Polar Year which officially begins on 1 March 2007. On 17 January 2007 the Finnish Presidency of the NCM hosted a conference on 'The Northern Dimension and Nordic Cooperation' in Finland. At the conference the newly appointed Secretary-General of the Nordic Council of Ministers, Halldór Ásgrímsson, underlined the strategic interest in the Arctic, not least due to climate changes. The NCM proposed to take part – in cooperation with others – in organising a second Northern Dimension 'Arctic window' seminar as a follow-up to the one held in Greenland in August 2002, and encouraged other regional partners, countries and the EU to participate in highlighting the challenges in the Arctic area and work towards concrete results and improvements in the Arctic.

www.norden.org

Contact: Senior Adviser Nikolaj Bock, Nordic Council of Ministers,
nb@norden.org, tel. +45 3396 0281



norden

Nordic Council of Ministers

Iceland Providing an IPY Hyperspace Venue

Iceland presents the Arctic Portal which will provide a wealth of useful information about IPY-activities.

It has been argued that much of the ongoing research in Iceland is in fact 'Arctic research', as a result of Iceland's geographic position. It comes therefore as no surprise that Icelandic participation is noted in sixty of the full IPY proposals. While IPY will hardly lead to a great increase in the number of Icelandic scientists involved in Arctic research (as much of their research is already Arctic in nature), it provides an opportunity for intensified international cooperation in their research. Icelandic scientists are acutely aware of the importance of communication and networking for enhancing the value of their work. This is one of the reasons why Iceland is concentrating on the creation of an Arctic Portal, providing a gateway to the Arctic on the internet which can function as a venue for IPY projects.

The Arctic Portal is an endorsed IPY project developed by an Icelandic project group lead by Iceland's Senior Arctic Official in consultation and co-operation with other members of the Arctic Council and its working groups and permanent participants, the Northern Forum, UArctic, the Arctic Centre at the University of Lapland, the Arctic and Antarctic Research Institute of Roshydromet, the International Centre for Reindeer Husbandry and others. Initially, it was mainly focused on the needs of the Arctic Council and its working groups and it is already functioning as such, with an integrated calendar of events, integrated document library and an integrated project directory, advanced search, interactive mapping, homepages for AC projects, etc.

The Arctic Portal is now being broadened, with IPY providing an important focus for its development in coming years. An agreement has been made with the IPY International Programme Office on using the Arctic Portal as a venue for IPY activities and projects provid-



ing integrated calendar, web-casting, project websites and workspaces, data management and other functions.

The results of IPY projects will be introduced on the Arctic Portal, keeping it open as an interactive instrument for follow-up IPY activities, education and outreach. The aim is to create a venue in hyperspace at the disposal of the Arctic community, which would become a part of the IPY legacy.

www.arcticportal.org

Contact: Ragnar Baldursson,
ragnar.baldursson@utn.stjr.is, tel. +354 545 9945