

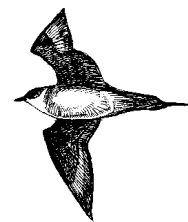
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# Ny-Ålesund Newsletter



10<sup>th</sup> edition  
June 2002

## Are geese changing the arctic tundra? A new EU research programme

Goose populations have increased dramatically in the last decades. After a period of strong decline, the Svalbard barnacle goose population was estimated only 300 birds in 1948. Present estimates are over 20.000 individuals. For other geese in Svalbard, historic data are less accurate. In 1940 the population of pink-footed geese was estimated slightly more than 10.000 individuals and the population has risen to 37.000 individuals at present. In the same period, the light-bellied brent goose population increased from 4000 individuals to 5800 individuals with a low of 2000 birds around 1970.

The reason for the increase in numbers can be found in the implementation of protective measures and changes in European land use. The establishment of hunting regulations and nature reserves has released the population numbers from becoming endangered, and the change in European land use with the use of artificial fertilizer and the increase in agricultural production has provided enough wintering habitat for the recent expansion. The geese are better able to survive the winter and arrive in their arctic breeding grounds in good physical condition. This improves breeding success and summer survival resulting in increased population sizes. During summer, the geese have to find their food on the arctic tundra and this area is clearly limited in Svalbard. In the past 15 years I have been part of a research programme on the Svalbard barnacle goose to study the limitations of population growth, by studying the geese in Ny-Ålesund. During the population increase, the local population has shown clearly density dependent effects with more competition for food and mortality of goslings and a stabilisation of goose numbers. However the geese have been expanding to new areas, and the total population kept increasing.

The tundra is heavily grazed by the geese, but is this grazing threatening the ecosystem? There is a precedent in Canada, where the increasing snow goose population has created a process of desertification and where salt marshes along the Hudson Bay have undergone a permanent change to barren silty sands. For Svalbard, I hope the effect is less dramatic.

The goose grazed vegetation is less influenced by salt of the sea. However a new study, funded by the European Community (fifth framework programme) will address this question in more detail.

With the short name FRAGILE and the long title Fragility of Arctic Goose habitat: Impacts of Land use, conservation and Elevated temperatures, a team of 17 researchers from 13 institutions, spread over 6 countries will try to model future scenarios of European agricultural land use, goose populations and the effects on the arctic tundra. The project will create a baseline GIS of goose habitat over the entire population range, model land-use changes for goose winter habitat availability, study the combined effects of goose grazing and climatic warming on vulnerable tundra ecosystems and disseminate the results to a wider public of governmental agencies, conservation bodies and farmers.

Much of the modelling will be based on existing data, but experimental studies on the effect of goose grazing and climatic warming will start in 2003 for a period of three years. We are planning to create experimental tundra plots with different grazing pressure by using tame geese. Effects on plant growth and survival, mineralisation, bacterial nitrogen fixation and the carbon and nitrogen cycle will be measured. Because the baseline vegetation has to be ungrazed by geese, this study will not take place in Ny-Ålesund. This summer, a small group of researchers will visit Svalbard twice to find the optimal study site. However Ny-Ålesund will also have increased research activity based on this new programme. In Ny-Ålesund, we will study how the vegetation recovers after a period of heavy grazing by excluding vegetation from goose grazing. At present, experiments of the effects of geese on arctic lakes (being part of the arctic tundra) are also planned in Ny-Ålesund. Finally, my population study on the Barnacle geese in Kongsfjorden will also continue to study the effect of intraspecific competition for food and the interaction with predation.

Dr Maarten JJE Loonen

### NINA MELHUS MOLDSTAD

We all mourn the tragic loss of Nina Melhus Moldstad 28 April 2002. We grieve for someone whose friendliness, vivacity and enthusiasm personified the Ny-Ålesund we love and enjoy.

Nina worked for the post office when she first arrived at Ny-Ålesund. She went on to work for Norsk Polarinstitutt and for Kings Bay. She saw the international community evolve and gave it her tireless support. Efficiency was her by-word, she could take any task or problem and see it completed or solved, and always with that radiant smile and friendly quip. On arrival at Ny-Ålesund or at departure, she put us on the right track and with happiness on our face.

Our hearts and sympathy go out to Even and the rest of her family.

### CAMPAIGN AT THE ZEPPELIN STATION

NILU has co-ordinated and participated in a campaign on mercury depletion episode at polar sun rise at the Zeppelin Station in the period from 15th of April to 15th of May. The campaign was founded by Ny-Ålesund LSF and scientist groups from Sweden, Canada and Lithuania participated. There were several interesting episodes during the campaign and the results will be published. Co-ordinator for the campaign was Torunn Berg, TBe@nilu.no

### INSTALLATION OF A NEW SUN PHOTOMETER AT NY-ÅLESUND

In April 2002 NILU installed a sun photometer of the type PFR (Precision Filter Radiometer) in Ny-Ålesund. The main application of the PFR instrument is to provide high quality spectral irradiance data to determine Aerosol Optical Depth (AOD) reporting e.g. to the Global Atmosphere Watch (GAW) program. The operation and provision of data is a collaboration between NILU and Physikalisch-Meteorologisches Observatorium Davos/World Radiation Center (PMOD/WRC). The PFR instrument will be regularly calibrated against a reference instrument maintained at PMOD/WRC.

The instrument is at the moment installed at the roof of the Sverdrup station. Alfred Wegener Institut has operated another sun photometer at Ny-Ålesund since 1991. In July 2002 the sun photometers at Ny-Ålesund will participate in an intercomparison campaign in Ny-Ålesund. After this campaign, the two instruments will be run in parallel "downtown" Ny-Ålesund for approximately one year. After this test period the PFR will be moved to the Zeppelin station (474 m.a.s.l.), where it will continue to measure for many years.

### CHAMP

With the GFZ/DLR Satellite Receiving Station in Ny-Ålesund more than 6000 passes of housekeeping and science data from the German geoscience satellite CHAMP were received since the beginning of the antenna installation in March 2001 and transmitted to GFZ Potsdam. The

availability of the receiving system has been better than 98%. The support of AWI and KB is highly appreciated.

CHAMP had performed its 10.000th revolution on April 23, 2002 and has provided extremely valuable data for investigations of the Earth gravity and magnetic field and for sounding the neutral atmosphere and the ionosphere.

### CLEAN BASE TECHNOLOGY

The workshop "Clean technology base for atmospheric research in Svalbard, 2005", took place in Brest, 14-15 May.

The conclusions of the workshop show that:

- the project of a clean base technology on the site of Ny-Ålesund can serve as a tool to bring some new knowledge on polar atmospheric research, notably regarding the snow pack and air interactions. A link with "the Changing Physical environment" project could be done by developing specific topics linked with the fjord system. A programme on snow pack and air interactions is viewed for 2004.
- the tethered balloon project is recognized as great interest for the scientist community, with strong links with the Zeppelin and Koldewey stations programmes, and with the CALIPSO project, for the data validation. The possibility of an aircraft use is to be further more studied.
- a technical topic concerning the new energies in polar areas could be open in the aim of new equipment at Corbel station.

The development of these tools, devoted to atmospheric science in Ny-Ålesund, would be used as a complement to the running programmes in Ny-Ålesund, for a better comprehension of the atmospheric chemistry in that area.

### UPCOMING CONFERENCES

6th Ny-Ålesund International Scientific Seminar:  
**"The Changing Physical Environment"**,  
Polar Environmental Centre, Tromsø, 8-10 October 2002  
Organised by Norwegian Polar Institute, Ny-SMAC and Ny-Ålesund LSF

#### Last Update:

We would like to encourage all scientists within the Ny-Ålesund research community as well as other scientists with complementary research activities to register for the seminar. Travel grants will be established for scientists with previous projects supported under the LSF-program. Please see the conference web-site for more information as well as forms for registration and abstract submission.

#### Program and Scope:

The seminar will address the broad field of "Physical environment research in Ny-Ålesund". It invites the whole physical environment research community of Ny-Ålesund to meet and present recent research results and to exchange information about their research and monitoring activities. The seminar also invites key multidisciplinary presentations involving studies of the "biological response to the changing physical environment". The last day of the meeting will be organised as a workshop for the purpose of drawing conclusions and formulating future challenges, possible

common research campaigns, identifying observational gaps in Ny-Ålesund as well as to assess the potential interdisciplinary interpretation of the integrated database available from observations in Ny-Ålesund.

The meeting will be organised as a Seminar Day 1 and 2 and a Workshop Day 3. For more information about program, registration and deadlines etc., please visit the seminar web-site at: <http://www.npolar.no/nysmac/sixthseminar>.

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International Conference in Tromsø:

**"Arctic-Alpine Ecosystems and People in a Changing Environment"**

Polar Environmental Centre, Tromsø, 24 Feb-1 March 2003. Organised by Norwegian Polar Institute (NPI), Norwegian Institute for Air Research (NILU), Norwegian Institute for Nature Research (NINA), University of Tromsø, Institute of Marine Research, European Network for Arctic-Alpine Multidisciplinary Environmental Research (ENVINET), Nordic Arctic Research Programme (NARP), Arctic Seas Consortium, Ny-Ålesund Large Scale Facility (LSF), European Commission.

**Last Update:**

The 1st Announcement folder is now circulated as well as posted on the conference web-pages at: <http://www.npolar.no/arcticlpin2003/>. The second announcement is scheduled for June 2002 while the Abstract deadline is set to 20 October 2002. Please visit the site for more information about the program and plans.

**Background**

The European Arctic and Alpine regions are experiencing large environmental changes. Increased temperatures and precipitation, reduction in sea ice and glacier ice, the increased level of UV-radiation and the long-range transported contaminants are challenging new stress factors for both terrestrial and aquatic organisms. The large annual variation in the physical parameters of these extreme environments is also a key factor in structuring the biodiversity and biotic productivity, and the effect of the stress factors can be critical for the population structures and the interaction between species. These changes may also have socio-economic effects if the changes affect the bioproduction, which form the basis for the marine and terrestrial food chains.

The conference will serve as the final conference of the European Network for Arctic-Alpine Multidisciplinary Environmental Research (ENVINET), the final conference of the Nordic Arctic Research Programme (NARP), the last user meeting of the Ny-Ålesund Large Scale Facility, the first conference of the Arctic Seas Consortium and the final workshop of the EU-project UVAC (The influence of UV-radiation and climate conditions on fish stocks: A case study of the north-east Arctic cod).

**Programme and Scope:**

The conference will address the broad field of "Environmental Change research in Northern Europe, Arctic and Alpine areas". This involves the contemporary environmental problems under the fields of Climate Change and ecosystem response, Long Range Transport of Pollutants

and Ozone/UV-radiation and biological effects in marine and terrestrial environments. The main idea is to identify the challenges in Arctic-Alpine Environmental Research along the main transport routes from Europe to the Arctic. The conference invites the marine, terrestrial and atmospheric environmental change research communities of Europe to meet and present recent research results and to exchange information about their research and monitoring activities. The conference is multidisciplinary in scope both in science and space, and shall create new links and understanding across the disciplinary boundaries and among European researchers and research infrastructures. The conference will in this context also discuss the role of research infrastructures in environmental change research and is used as a meeting place to create new consortia and research proposals for the 6th Framework Programme of the European Commission.

The meeting will be organised as a research conference over 6 days. It will include general sessions with keynote and review talks, and parallel sessions for the different disciplines. In order to establish the genuine multidisciplinary goals of the meeting, the parallel sessions shall not exclude the objective of interdisciplinary exchange among the various groups and sessions.

**Marine biological research in Kongsfjorden:**

**KONGSFJORD ECOSYSTEM WORKSHOP II**

An Ecosystem Workshop II about the physical and biological environments in Kongsfjorden will be held at the Institute of Oceanology (IOPAS) in Sopot, Poland, 7-10 November 2002. The meeting location will be Hel Biological Station, on the north coast of Poland. There will be about 40 participants from many disciplines, including: glaciology, hydrology, oceanology, bacteria, plankton, benthos, fishes, seals and seabirds. The contact person at IOPAS is Prof. Jan Marcin Weslawski ([weslaw@iopan.gda.pl](mailto:weslaw@iopan.gda.pl)).

This Workshop will build on the experiences from Kongsfjord Workshop I, held at UNIS in Longyearbyen in November 2000. This workshop included 40 participants from France, Germany, Italy, Norway, Poland, Russia, Spain, Sweden and the UK. Two publications about the physical and biological environments in Kongsfjorden were published: 1) Hop *et al.* 2002. The marine ecosystem of Kongsfjorden, Svalbard. *Polar Research* 21, 167-208. (Reprints from [Haakon.Hop@npolar.no](mailto:Haakon.Hop@npolar.no)). 2) Svendsen *et al.* 2002. The physical environment of Kongsfjorden-Krossfjorden, and Arctic fjord system in Svalbard. *Polar Research* 21, 133-166. (Reprints from [Svendsen@gf.uib.no](mailto:Svendsen@gf.uib.no)).

The focus for Kongsfjord Ecosystem Workshop II will be the coupling between Kongsfjorden and West-Spitsbergen shelf- and shelf slope waters. We already know that the exchange between the fjord and the open coast is large, and this has consequences for the balance between Arctic (cold) and boreal (temperate) species in Kongsfjorden and for the production there. The Workshop II will also focus on

*cont. next page*

climate signals and effects of climate change on the ecosystem in Kongsfjorden and adjacent coastal waters. Attempts will also be made to further link the physical and biological processes and quantify the initial food web models for this fjord.

Kongsfjorden and Hornsund have been nominated as European Flagship Sites of Biodiversity by the BIOMARE programme (EU). This will be of importance for long-term research and monitoring of biodiversity in these fjords in Svalbard. Marine biological research in Kongsfjorden is now also part of the ENVINET network of EU (contact [Stig.Falk.Petersen@npolar.no](mailto:Stig.Falk.Petersen@npolar.no)), and marine projects are conducted annually in the fjord under the Large Scale Facility Programme of EU (contact [person.jon.borre.orbak@npolar.no](mailto:person.jon.borre.orbak@npolar.no)). Finally, the Marine Systems Working Group (chaired by [Haakon.Hop@npolar.no](mailto:Haakon.Hop@npolar.no)) attempts to initiate and coordinate new marine research initiatives in Kongsfjorden and surrounding waters in Svalbard.

*Haakon Hop  
Research Scientist in Marine Biology  
Norwegian Polar Institute, Tromsø*

## Calendar of Arctic Meetings

The 17<sup>th</sup> NySMAC meeting will be held at the Polar Environmental Centre, Tromsø 7 October 2002

6th Ny-Ålesund International Scientific Seminar: "The Changing Physical Environment", Polar Environmental Centre, Tromsø, 8-10 October 2002

**Kongsfjorden Ecosystem Workshop II**  
Gdansk, Poland, November 2002.

"Arctic-Alpine Ecosystems and People in a Changing Environment"  
Polar Environmental Centre, Tromsø,  
24 Feb - 1 March 2003.

For a comprehensive list of published meetings, look at Survey of Arctic Meetings:  
<http://www.iasc.no/sam.htm>

## Staff News

### Norwegian Polar Institute (NP):

**Are Bäcklund** was employed as optical engineer this winter and **Katrine Røtnes** will start as operational engineer this summer.

### Alfred Wegener Institute (AWI):

**Yvonne Kramer** has replaced **Mareile Wolff** as station manager.

## Publications

### Research in Svalbard 2002

A yearly information. Available from Svalbard Science Forum and on <http://www.npolar.no/ris>

**Ny-Ålesund - International Research at 79°N**  
3<sup>rd</sup> revised edition. By the Norwegian Polar Institute in co-operation with Kings Bay AS.

### The Ny-Ålesund Safety Guide

By Nick Cox, NERC (2<sup>nd</sup> edition 1998)  
An introduction to safety in Ny-Ålesund and its surroundings. The guide is obtainable in Ny-Ålesund from Kings Bay AS and Sverdrupstasjonen.

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### Next edition of Ny-Ålesund Newsletter:

Autumn 2002

Editor: Marit R. Pettersen

