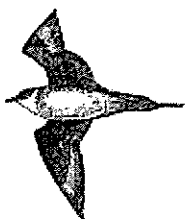


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18th edition
July 2006

Ny-Ålesund Newsletter

The MariClim project in Kongsfjorden, Svalbard

Geir Wing Gabrielsen, NPI

The MariClim project (Marine ecosystem consequences of climate induced changes in water masses of West-Spitsbergen) has a high activity with cruises and fieldwork in Kongsfjorden this year. A total of three cruises have been conducted and two more are under way. Scientists and students from seven countries have collected hydrographic and biological data from the shelf area towards the inner part of Kongsfjorden. This summer, two doctoral students and three graduate students have been working hard with experiments and samples in the Marine Laboratory and conducting fieldwork in the little auk and kittiwake colony in respectively the Seiring- and Krykkjefjellet.

Last winter was unusual in Kongsfjorden since there has been very little ice on the fjord. According to oceanographer Vigdis Tverberg, the sea water temperature has been two degrees above normal this last winter. In fact, this winter season had the least ice cover in Kongsfjorden in the records for the last decades. The small amount of sea ice in Kongsfjorden made it difficult for the sea ice group to do their studies. However, good hydrological data have been collected by detailed CTD measurements and three moorings placed in different parts of Kongsfjorden.

A reduced sea ice program was conducted on the sea ice north of the islands in the inner part of the fjord. Both the hydrographic data and the sea ice based data are of high value given the unusual ice circumstances. A meteorological station, observing wind speed, wind direction and air temperature, was installed in the northern end of Forlandet in June. The ships RV *Lance* and RV *Jan Mayen* have been used to determine the zooplankton and fish abundance along transects from the shelf to inner Kongsfjorden. Many samples have been collected to determine the lipid and energy of different species. MariClim divers have also collected hard-bottom benthos for stable isotopes and clams for the study of the growth patterns related to climate variability. This project has included the Russian Ph.D. student Andrey Y. Voronkov, who is partly funded by Statoil. In the Marine Laboratory in Ny-Ålesund, Ph.D. student Fredrik Broms has worked hard to establish his temperature experiments on polar cod (*Brigades saida*). With regard to seabirds, the little auks (*Alle alle*) started breeding early this year. Ph.D. student Jörg Welker and his team are working day and night to obtain data on the feeding ecology and energetics of little auks. French and Norwegian scientists work together closely to obtain the data on kittiwakes (*Rissa tridactyla*).

In January 2007, all scientists from the MariClim project will meet to discuss the data and make new plans for the 2007 season. MariClim will continue through the IPY period and is thus an important part of Ny-Ålesund's IPY portfolio.

More information about the MariClim project: www.npolar.no/MariClim

All students in MariClim are part of the science trainee school in ARCTOS (<http://www.nfh.uit.no/arctos/>)

Project manager: Geir Wing Gabrielsen, Norwegian Polar Institute, Tromsø.

A new ecotoxicology project in Ny-Ålesund

Geir Wing Gabrielsen, NPI

A new ecotoxicology project "Biotransformation of halogenated organic compounds (HOCs) and associated biological effects in Arctic seabirds" will start up in Ny-Ålesund in the beginning of August 2006. During the next 3 years we will perform a series of investigations to explore Arctic seabirds' potential to metabolize contaminants. Furthermore, we will study the effect of lipid cycles on HOC toxicokinetics, biotransformation enzyme activity, and subsequent biological effects. Until now, most contaminant-related studies on Arctic seabirds have dealt with birds caught in the wild, which has made it difficult to establish cause-effect relationships. Therefore, the proposed study aims at investigating the effect of contaminant exposure and biotransformation on contaminant levels and patterns. Furthermore, the study aims at investigating the contaminant-induced biological effects in Arctic seabirds using an experimental design with chicks bred in captivity. The effect of lipid cycles on biotransformation and effects will also be addressed. Two doctoral students (Lisa Bjørnsdatter Knudsen and Marit Nøst Hegseth) will start their fieldwork in Kongsfjorden at the beginning of August. Samples of kittiwake and fulmar chicks will be collected in order to test the methods before starting the main experiment in Ny-Ålesund during the summer of 2007. This project is being conducted by a team of researchers including Drs. Geir Wing Gabrielsen and Hans Wolkers from the Norwegian Polar Institute, Dr. Lionel Camus from Akvaplan-niva, Even Jørgensen from the University of Tromsø, Dr. Eldbjørg Heimstad from the Norwegian Institute of Air Research, Drs. Bjørn M. Jenssen and Augustine Arukwe from University of Trondheim and Dr. Francesco Regoli from Politecnica Della Marche in Italy.

Project manager: Geir Wing Gabrielsen

Polar Sun show – warm up for IPY

Dr. Andreas Herber, AWI

The Earth's polar regions are key areas for our climate. A detailed understanding and a comprehensive description of the aerosol pollution are important prerequisites for precise climate predictions. An effort to quantify direct and indirect climate forcing by polar aerosols will be made through a set of closure experiments using observations in conjunction with model calculation and satellite data.

Atmospheric aerosols have a significant effect on the radiation balance, and consequently on the Earth's climate. Naturally occurring aerosols include droplets of sulphuric acid, sea salt, Sahara dust as well as other mineral components. However, the human influence has been increasing. "Nowadays, twenty to thirty percent of atmospheric aerosols are produced by humans through incinerations, air traffic and industrial exhaust fumes".

Sun photometers represent special modification of radiometers, designed to measure sun intensity in various colour ranges. By comparing light intensities at ground level and outside the atmosphere, the amount of light attenuated by the atmosphere through scattering and absorption can be determined. Wavelength dependent changes in intensity give colour changes of sunlight. The colour changes provide information about the aerosols, i.e. fine dust particles reducing light penetration in the atmosphere.

The inter-comparison aims at establishing a bipolar network to obtain data needed to quantify properties of aerosols at high latitudes, including seasonal background concentrations by measurements of aerosol optical depth (AOD), spectral characterizations, and the evolutionary patterns of the natural and anthropogenic processes that perturb the aerosol cycles. The programme, operating with previously unknown accuracy, will measure aerosols to determine pollution levels at more than twenty locations throughout the polar regions.

The objective of the POLAR-AOD network (Aerosol Optical Depth in Polar Regions) is to understand the pathways by which anthropogenic, but also natural, aerosols are transported to the polar regions. For the first time ever, the temporal and spatial coverage of study areas will allow a global assessment of optical aerosol effects, including at both poles. The concerted data-recording operation represents essential groundwork towards the assessment of polar air pollution, based on the Polar AOD Network, which will started in the International Polar Year 2007. The aerosol program, operating with previously limited comparability and accuracy, will measure aerosols to determine pollution levels from 21 involved countries throughout the Arctic and Antarctic.

A polar Sun show has been performed from 23 March to 5 April 2006 at on Spitzbergen, Norway, with the support of AWI and ISAC-CNR Institute. Twenty scientists from nine nations were gathering at Ny-Ålesund (Spitsbergen) to calibrate their spectral radiometers. The Ny-Ålesund research infrastructures, mainly the German French AWIPEV base, which is operated jointly by the Alfred Wegener Institute and the French polar research institute Paul Emile Victor,

the Italian station Dirigibile Italia and the Japan Rabben station managed respectively by AWI, POLARNET and NIPR, offered the participants all necessary support. The campaign was also partly supported by SCAR - AGCS program.

The Kings Bay Marine laboratory – first year running

Kjersti Dahle, Kings Bay AS

One year has passed since the Kings Bay Marine Laboratory in Ny-Ålesund was officially opened. The first season started with a few projects, and the scientists ended their work in November. During the winter, Kings Bay AS tested the sea water system to prepare for the 2006 season. It is clear that the laboratory extends the season for marine science work in Ny-Ålesund. In 2006, the season started already in March, with the bulk of projects starting early in May. For the peak season (June-August) the laboratory has been almost fully booked. It has been exciting to see so many scientists working on different projects and sea water running through the experiment tanks holding all kind of organisms collected from Kongsfjorden.

This year, projects in the laboratory represent work on organisms from lower trophic levels, like bacteria and nutrients, micro- and macro-algae and zooplankton and a larger setup for a polar cod project run by NPI.

An upgrade of infrastructure and scientific equipment has been financed by The Research Council of Norway. New equipment include microscopes and a stereoscope with camera, centrifuges, scales, Milli-Q water apparatus, - 80° freezer, autoclave, spectrophotometer and other basic laboratory equipment and sampling gear.

Except for some minor technical start-up problems, we feel that the laboratory has been satisfying for the scientist and their projects. The laboratory will be used by scientists running projects until the end of November this year.

Please visit our website to find out more about the Kings Bay Marine Laboratory: www.kingsbay.no.

Forest fires threatens the Arctic

Ove Hermansen, NILU

Large boreal forest fires are the primary cause of long range transport of particles into the Arctic. This is the conclusion of a new study performed by Sr. scientist Andreas Stohl at NILU.

It has been shown that boreal wildfire emissions influence the atmospheric composition on a hemispheric scale. Black carbon particles absorb solar radiation and might have a significant contribution to the melting of Arctic glaciers and sea ice.

Most large boreal forest fires have natural origins like lightning, though some are caused by human activity. The number of large forest fires, especially in Siberia and North America, has increased over the last 10-12 years and is expected to grow further if the climate continues to warm and dry up, thus representing a growing threat to the Arctic region.

Ref.: Journal of Geophysical research 9th June 2006, A. Stohl.

Record high pollution levels in Ny-Ålesund

Ove Hermansen, NILU

Last winter and spring Ny-Ålesund had several pronounced air pollution events, the most severe pollution episodes occurring in April-May. Concentrations of almost all measured air pollutants at the Zeppelin Observatory exceeded the previously recorded long-term maximas by far. For instance, the highest 1-hour ozone concentration ever recorded at the observatory was 122 $\mu\text{g}/\text{m}^3$. In May 2006 ozone peaked at 165 $\mu\text{g}/\text{m}^3$. Carbon monoxide were recorded above 250 ppb for the first time, normal levels for the period would be between 100 and 150 ppb.

These episodes occurred during periods of abnormal high temperatures. The record high pollution levels were caused by a combination of meteorological conditions and severe grass and forest fires in eastern Europe according to Sr. scientist Andreas Stohl at NILU.

OASIS

Harry Beine, CNR

Ocean – Atmosphere – Sea Ice – Snowpack Interactions and connections to climate change.
(www.OASIShome.net)

OASIS will study the chemistry in the air over the Arctic Ocean as a large IPY effort. The health of mammals and humans is at stake, and a future change in climate will undoubtedly introduce unknown changes. OASIS will make use of a variety of platforms (icebreakers, ice islands, buoys) to obtain year-round information on the behavior of such key chemicals as ozone, mercury, and carbon dioxide.

News from the Netherland's Station in Ny-Ålesund

Maarten Loonen, UoG

A website has been launched about the station: <http://www.arcticstation.nl>

It contains background to the research projects, details on the people working at the station and a weblog with photo's about ongoing research. It will be updated daily, using our new internet connection.

For 2006, the monitoring of the goose population has shown early hatching of geese (25 June, while 29 June was earliest in a time series of 16 years and 30 June is normal). The number of goose nests in the fjord has been declining since 2000, following heavy predation of goslings. There is a very small non-breeding flock of only 16 young birds, which is an alternative way of showing that gosling production was low in 2005. This year, we expect also no gosling production. There is a fox den with 9 puppies under London IV. Dead goslings are brought to the den every other hour. In the past winter there has not been any feeding of foxes (thank you!), so we are studying now natural fluctuations in predation pressure. At this moment, the area close to the dog yard is used as the safest area by geese (grazing) and terns (nesting). But this can change any moment.

Please visit the web site to find more information and the latest updates on the stations activity in Ny-Ålesund: www.arcticstation.nl

Svalbard Science Forum (SSF) web-site

Monica Sund, SSF

News from Svalbard Science Forum (SSF) and generally from Svalbard research will, in the future, be published on the new web site www.ssf.npolar.no. Contributions are welcome. Information on logistics, legislation and different research facilities can also be found here. In December this year a new database for registration and search of projects will be available.

Calendar of Arctic Meetings

25th NySMAC meeting
16-17 October 2006 in Oslo, Norway

For a comprehensive list of published meetings, look at **SAM** (Survey of Arctic Meetings) on the IASC home page:
<http://www.iasc.no/>

Staff News

Italian Station Dirigibile:
Dott.ssa Antonietta Ianniello is the new Italian station manager.

Norwegian Polar Institute/Sverdrupstasjonen:
Dr. Trond Svenøe has taken over as station manager for a period of two-years.
Jane Helén Carlsen is employed as operational engineer.

Norwegian Mapping Authority:
New station engineer: Jan Ivar Tangen.

Kings Bay AS:
New technical manager: Øyvind Tåsåsen

New advisor: Bodil Johanne Paulsen

AWIPEV

The AWIPEV Base leader has changed.

Rainer Vockenroth has taken over the position from Anne Hormes, who returned to Germany in early June.

Cedric Couret, from south of France, has joined the AWIPEV permanent staff (previously 2 persons) since April 2006. His contract will run until the beginning 2007. He's acting as the logistics engineer on the AWIPEV Base.

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