

Report from the 10th Ny-Ålesund seminar



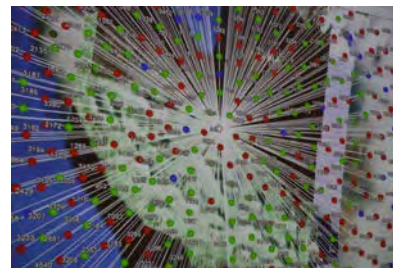
From 25-26 October 2011 the 10th Ny-Ålesund seminar took place at the Lillestrøm Centre of Expertise, in Kjeller, Norway. About 70 experts with a background in Chemistry, Geology, Marine Biology, Meteorology and Physics – to mention a few, took part in the interdisciplinary meeting. The seminar was hosted by NILU, the Norwegian Institute for Air Research. Financial support from the Norwegian Research Council for the organization of the meeting has also made it possible to invite five PhD-students and young researchers to give presentations of their research at the seminar. During two, with oral and poster presentations fully packed, days it became clear to everybody joining the meeting that both quality and quantity of the research at Ny-Ålesund has increased considerably during the last years.

With the help of the flagship leaders and the Svalbard Science Forum SSF, the seminar was structured around the four flagship programs,

1. Kongsfjord System Flagship
2. Atmospheric Research Flagship
3. Terrestrial System Flagship
4. Glaciology Flagship

which serve as an umbrella for research activities in Svalbard. Although all areas were represented at the meeting, the atmospheric research community was the largest group represented at the meeting, and this year's organizer would like to challenge the organizing team for the next meeting to seek for even better representation of the "earth-bound"-communities.

Ny-Ålesund as global monitoring station has never been more important than now and is needed for surveillance of climate change and its effects. In his presentation, Kim Holmen (NP) colourfully illustrated the increased interest of nations having research activities in Ny-Ålesund, and Christiane Hübner (SSF) showed a map with an exploded number of project registered in the Research in Svalbard (RIS) database.



Atmospheric researchers, who have been involved with the CICCI – Cooperative Investigation of Climate-Cryosphere Interaction – parably met at the second day of the meeting. This initiative was established to improve the understanding of processes controlling distribution of black carbon in the Arctic atmosphere, deposition to snow and ice surfaces and resulting climate impacts. The scientists at the seminar decided to continue this cooperation in the next years. With a new Italian Climate Change Tower in Ny-Ålesund, tethered balloons and UHV, new tools have become available and progress has made in understanding the vertical distribution of aerosol in the planetary boundary layer and their effect for our climate. New genetic methods in the field of biology, glacier dynamics and their consequences, results from CO₂ enrichments experiments in the Arctic, and organic carbon transformation in high Arctic Peatlands of Svalbard were discussed, just to mention a few of the about 60 presentations.

Some things have not changed: although air-travel from/to Ny-Ålesund/Svalbard is no longer done with a small 7 passenger plane as 20 years ago, severe weather has stopped a few scientist to come to the meeting in time. A common dinner at a "Norwegian" pizza restaurant and talks with colleagues, many of them working together for a long time, made the event very enjoyable.

Kerstin Stebel, NILU



Very satisfied participants at the Ny-Ålesund seminar in Kjeller (photo: NILU)

NORUT – new member of NySMAC

We would like to welcome the Northern Research Institute AS from Tromsø as new member of NySMAC. The research director, Dr Kjell Arild Høgda will be the representative for Norut in the committee. See www.norut.no for more information about the institute.

Geodetic Observatory

About a month ago the Norwegian Mapping Authority received the good news that the Norwegian government has allocated money for a modernization of the geodetic observatory at Ny-Ålesund in accordance with their proposal. With this message their project will enter into a new phase.

They are working on the additional questions from the Governor of Svalbard, given as a result of the EIA consultation. The goal is to fulfill this within this month.

Call for new SSF funding options

SSF is very happy to announce the first round of SSF workshop and support funds!

This month the call went out for the first round of new SSF funding scheme. This supports workshops and initiation of research initiatives which comply with the goals of the SSF.

The deadline is 15th of February at 1300 CET. Please see the link below for more information and to see the complete call for proposals. If you have any questions please do not hesitate to contact SSF. Link:

<http://www.forskningsradet.no/en/Funding/SSF/1253971526892>

SSF workshops

SSF organizes these cooperation workshops in 2012:

- No. 3 (February): Changes in snow/ice and pollutants and their effects on terrestrial ecosystems. (See next page for more information).
- No. 4 (August): Zackenberg & Nuuk - what can we learn for Svalbard?
- No. 5 (November): Permafrost and costal lines

More information on previous and coming SSF workshops:

<http://www.svalbardscienceforum.no/pages/ssfworkshop.htm>

Meager interest for student camp

The plans for the international student camp in Ny-Ålesund in the autumn of 2012 may be hanging by a thread. So far only two stations have expressed interest in participating in the project. SSF will make a final effort to recruit more stations before putting the plans on ice until 2013.

Netherlands Arctic science focuses on Ny-Ålesund

The Netherlands Ministry of Education has launched a new five year research programme in the Arctic. They have set aside €750.000, - annually and have asked the Dutch science community to develop new plans. Part of the money will be spent on studying the Greenland ice cap, the majority will be spend on Ph.D. students working from Ny-Ålesund. The ministry has chosen the Ny-Ålesund setting as a stimulation for international cooperation. With

this decision, the science planners have acknowledged NySMAC, the Ny-Ålesund flagships, Svalbard Science Forum and the SIOS program for their high ambition level and strong emphasis on coordination for future arctic research.

On 30 November 2011, a workshop was held in Amsterdam where Dutch scientists could meet with representatives of the Norwegian Polar Institute, Svalbard Science Forum, Alfred Wegener Institute and the British Antarctic Survey. The workshop has secured the money and a call for proposals is expected in February 2012.

Maarten Loonen, UoG, Arctic Centre

NyScience - a local newspaper in Ny-Ålesund

In the summer of 2011, the station leaders in Ny-Ålesund were brainstorming on improving scientific interaction between scientists across nationalities and science fields.

One of the ideas materialized with the start of a local newspaper called NyScience. The concept is to focus on onsite issues and other matters of interest and to rotate each issue its editorship among the various stations. NyScience is a folded double sided colour printed A4, printed by Kings Bay and distributed in the Mess building. The first six issues have been filled by the Netherlands station, AWIPEV, the NERC station, Sverdrup station, the Chinese station and the Italian station.

During the NySMAC meeting in October, there was a discussion on how to proceed with two printed information channels: NyScience and the Ny-Ålesund Newsletter. The conclusion was that there is room for both as long as NyScience focuses on local information and activities as they happen, while the Ny-Ålesund Newsletter is our official communication to the rest of the world.

Maarten Loonen, UoG, Arctic Centre

36th NySMAC meeting in Stockholm

The next NySMAC meeting will be held in Stockholm, Sweden 20-21 March 2012. Stockholm University will host the meeting. For more information – see npolar.no/nysmac This means that NySMAC has decided not to attend the ASSW in Montreal this year.

Launch of ICI-3 from Ny-Ålesund

Kings Bay reported on their web-site that Andøya Rocket Rang launched the ICI-3 sounding rocket from Ny-Ålesund on Saturday 3 December 2011. The launch was successful in every aspect and everyone involved in the process were very satisfied.

Balloon launch in January

In January we can read from the Kings Bay web-site that a research team from the University of Rome has a balloon campaign in Ny-Ålesund. They work together with CNR – the Italian station and the balloon expert Steven Peterson from ISTAR to make some test launches in the Arctic winter.

The aim is to see the balloon trajectory over the Arctic in winter, for future larger balloon campaigns, aiming to study the cosmic radiation and other astrophysics experiments. For more information see www.kingsbay.no

The Sverdrup Station in 2011

By Max König, Norwegian Polar Institute

The Sverdrup Station can look back at a good summer with successful projects, but we can confirm the Kings Bay statistics that we had less activity in this year compared to 2010. The number of visiting scientists was considerably smaller, but the number of lodging days in fact only somewhat smaller (143 scientists / 2193 lodging days in 2011 versus 213 scientists / 2576 lodging days in 2010).

The main reason for this decline we see in both the International Polar Year as well as ArcFac having ended in 2010. The comparably more quiet period in late summer was compensated by a larger project, VAUUAV/CICCI in spring 2011. This project filled nicely the usually quiet shoulder season. In early winter, the rocket launch by the Andøya Rocket Range and the University of Oslo brought high activity to the Sverdrup Station during an otherwise quiet time.



During 2011, our engineers for the last years, Dorothea Schulze and Vigdis Lonar Barth, finished their time in Ny-Ålesund. Dorothea Schulze is now employed at NILU in Kjeller while Vigdis Lonar Barth is working at the Norwegian Space Centre in Oslo. We were very fortunate to have them with us in Ny-Ålesund and we will definitely miss both of them in our team, but we are also happy to welcome Marta Karoline Jansen and Sanja Forström, who started as new engineers in our team this summer.



At the Zeppelin monitoring station, a new instrumentation platform was built this summer. At present, many instruments are located on the roof of the Zeppelin station and maintenance work of these happens close to the air intake used for measurements. Having new instruments on the platform rather than on the roof will minimize impact on the air intakes.

Also on Zeppelin, an energy saving project was initiated in 2011. In a first step, the ventilation system and the power transformer will be exchanged to reduce energy consumption. The material for this has arrived in Ny-Ålesund and installation will happen after Easter 2012.

At present, visitors to Ny-Ålesund are required to register their stay at various separate websites. Under the lead of

SSF, Kings Bay, AWIPEV and the NPI - Sverdrup Station spent time on the development of a new combined booking system, which will integrate the various booking-related sites such as RIS, Kings Bay booking, station booking and governor's permissions under one address. The specifications have been compiled and finalized by SSF and we hope for an implementation in 2012.

More information on projects at the Sverdrup Station can be found at <http://sverdrup.npolar.no>. There you also find all Zeppelin webcams including a new high resolution web camera by Jack Kohler looking towards the front of Kronebreen.

SSF cooperation workshop No. 3:

“Changes in snow/ice and pollutants and their effects on terrestrial ecosystems”

Svalbard Science Forum (SSF) aims to create more coordination of national and international research activity in Svalbard. There have been many individual snow studies covering multiple fields and areas in Svalbard, but few interdisciplinary studies. SSF therefore holds a workshop in Oslo 13-16 February 2012 for researchers working in Svalbard. The workshop aims to increase international and interdisciplinary coordination and common use of data and logistics giving lower environmental footprint.

Focal points of the workshop:

- Snow – knowledge of fundamental physical and chemical conditions, amounts and distribution, movement and transformation, impact of regional and local climate on snow properties and dynamics, snow cover and albedo, snow cover and energy balance of tundra; melting/freezing processes, percolation, properties of icy/snow layers
- Pollutants – levels in snow and ice, exchange of pollutants between the atmosphere and soil/vegetation, pollutant pathways, levels of pollutants in biota and the effects on Arctic terrestrial animals
- Ecology – effects of changes in winter climate on terrestrial ecosystems; from soil, microbial activity, plant biochemical processes, growth and reproduction, invertebrate and vertebrate herbivores

The Goals - topics to present and discuss:

1. Exchange of information about on-going research activities and projects
2. Presentation of activities planned for the near future (next 2-5 years)
 - Incl. SSF foci: cooperation, remote sensing and environmental footprint
3. Identify gaps of knowledge and topics of special interest
4. Identify areas of potential cooperation and where to concentrate efforts
5. Data sharing and project cooperation
6. Updates on previous snow accumulation papers
7. Outreach of workshop report

Halvard R. Pedersen, SSF

Measurements of Black Carbon and its effect on snow albedo

By Christina A. Pedersen¹, Jean-Charles Gallet¹ and Zhangwei Wang²

¹Norwegian Polar Institute, Norway

²Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, China

Striving to understand the Arctic climate feedback processes, Norwegian and Chinese researchers collaborate in the project “Long range transport of black carbon and the effect on snow albedo in North-east China and in the Arctic” (LOTUS) funded by the Norwegian Research Council. The project focus on climate studies of Black Carbon (BC) and its effect on snow and snow albedo. The substantial changes in the Arctic climate and ecosystem over the last decades have prompted the need for increased collaboration in international research. Both Norway and China have long traditions with snow and ice research in the Arctic and LOTUS will serve as a basis for exchanging this knowledge and experience. The projects will also benefit from collaboration with partners from Sweden and the USA.

Recently, the Inter-governmental Panel on Climate Change (IPCC) identified BC in snow and ice as a potentially large climate-forcing agent – especially to the Arctic. However, the lack of observations and poor process understanding makes estimates of their impact on climate uncertain. A severe climate impact of BC is the albedo reduction in snow and ice covered areas. Albedo is the ratio of the incoming to reflected light by a surface and can be as high as 90% for a pure snowpack. Snow albedo is mostly dependant on the snow physical properties, e.g. the size of the snow grain, the snow density or the snowpack thickness and it naturally decreases with time when snow is aging.

BC particles are emitted by non complete combustion processes of fossil fuel, biomass burning and coal burning, and is constituted of very small particles easily transported in the atmosphere and deposited on the snow surface by dry processes (gravity) or by wet processes (particles included in or on a snow flake due to physical processes in

clouds). Very small amounts of BC, in the order of 10 ng of BC per g of snow, which is the order of magnitude for BC in Arctic snow, reduces the albedo by approximately 0.5-3% depending on snow grain size and wavelength. This implies that the contaminated snow absorbs more energy than pure snow and thus, the snow temperature increases and it melts faster.

In the framework of the LOTUS project we have established two sites for black carbon and snow measurements, one in Changbai in North East China and one in Ny-Ålesund at Svalbard. In Ny-Ålesund, we perform measurements of snow albedo, snow physical properties and BC concentration in the snow surface behind the Norwegian Polar Institute research station, Sverdrup Station.

This spring the continuous monitoring was complemented by a 1.5 months long field campaign by NPI Post Doc Jean-Charles Gallet. The aim of this extended survey was to be able to study snow processes at a more detailed level. The field period spanned from early April to mid-May covering dry and melting snow conditions. A usual work day in the field consisted of digging a deep snow pit and observing the snow layers. Extra care was taken for the surface snow (top 5 cm) as this controls most of the snow albedo variation. Observations of snow grain size, snow density and additional snow albedo were performed. Surface snow was also sampled for the BC analysis. The field work was concentrated on the tundra, very close to Ny-Ålesund village, but for some days measurements were performed other places, like on glaciers (Brøggerbreen, Holtedahlfonna, Kongsvegen) or on the sea-ice in Kongsfjorden, in order to observe the effect of BC at a remote location to make sure the monitoring measurements were not contaminated by local sources from Ny-Ålesund. This year the fieldwork in LOTUS were connected to another project, VAUAV (Variability of Albedo Using Unmanned Aircraft Vehicle), which investigates albedo variability at a larger scale using an Unmanned Aerial Vehicle (UAV). In total, more than 50 snowpits and 150 BC snow samples was accomplished during the 2011 season in and around Ny-Ålesund.



Picture 1: Black carbon snow sampling in Svalbard, April 2011. Photo: J. C. Gallet



Picture 2: Monitoring of snow albedo on tundra behind Sverdrup station, Ny-Ålesund, April 2011. Photo: J. C. Gallet

Karst caves on Blomstrandhalvøya

Winfried Dallmann, NPI

Blomstrandhalvøya consists almost exclusively of marble of Precambrian age. The marble is easily soluble, which has given rise to an intensive karstification of large parts of the area. More than 50 marine caves occur within the tidal zone along the shores, which are continuously washed out by the sea. Some are being used as sightseeing targets for people residing or working in Ny-Ålesund. In addition, several tens of older caves occur at higher elevations; they were formed by subglacial meltwater streams during the ice ages. Some have open lengths of up to 40 m, while others are filled in with debris or ice. Besides caves, other karst features like sink holes, karst corridors, etc. occur.

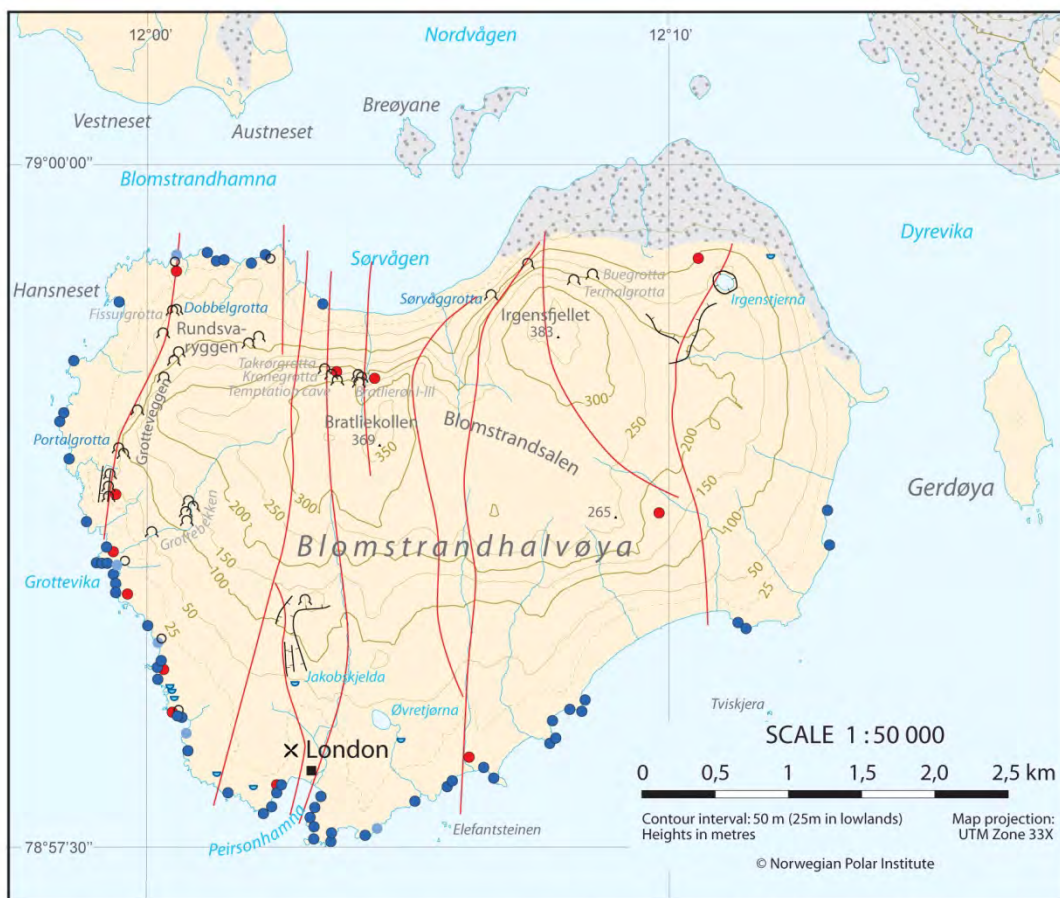
Stein-Erik Lauritzen, a speleologist from Bergen, published a paper about these caves in 2006 (Caves and speleogenesis at Blomstrandsøya, Kongsfjord, W. Spitsbergen, Int. Journal of Speleology 35(1), Jan. 2006, p. 37-58). On the basis of his paper, we decided to present a map of Blomstrandhalvøya showing karst features – accompanied by photographs – in a Geoscience Atlas of Svalbard, which currently is prepared at NPI. In this context we had one day's fieldwork on the island last summer. We tried to recognize as many as possible of the described

karst features, to determine their exact position, and to make our own photo documentary.

Some of the most prominent caves and features, preliminarily named in Lauritzen's paper, are now formally named and integrated into NPI's place name database. These are the cave names Portalgrotta, Dobbelgrotta, Sørvåggrotta, as well as some other geomorphological features (Grottevikja, Grotteveggen, Rundsvaryggen and Irgenstjerna). In this context it might be appropriate to recall that Blomstrandhalvøya will not be renamed into -øya, although it has been an island for the last 20 years. The Place Name Committee considers the historical information in the name – showing that the island once connected to Spitsbergen by a glacier – should not be lost.

Illustrations:

- 1) Map of Blomstrandhalvøya showing karst features
- 2) (Photo DSCF0697) The entrance of Portalgrotta, a 40 m long cave on the western mountain side of the island, can be seen from a long distance.
- 3) (Photo DSCF0733) Dobbelgrotta, whose roof is partly collapsed, at the northwestern corner of the island, is easily accessed from the shore.
- 4) (Photo DSCF0676) Sink holes or dolines are common in connection with marine caves along the shore, here in Grottevikja.



Blomstrandhalvøya, karst features

- Bedrock with no or thin cover
- Moraine cover
- X Marble quarry, abandoned
- Palaeokarst (Devonian)
- Mining site, abandoned
- Fault in bedrock

Karst features mapped by S.-E. Lauritzen, Univ. of Bergen, 2006; modified by W. Dallmann, 2011:

Names shown in light grey are not officially recognized.

- Marine cave, active
- Marine cave, relict
- Karst cave, relict
- Escarpment of karst origin
- Spring
- Doline, sink hole



The entrance of Portalgrotta, a 40 m long cave on the western mountain side of the island, can be seen from a long distance.



Dobbelgrotta, whose roof is partly collapsed, at the northwestern corner of the island, is easily accessed from the shore.



Sink holes or dolines are common in connection with marine caves along the shore, here in Grottevika.

Topics from the 35th NySMAC meeting

Topics from the previous NySMAC meeting held in Kjeller, Norway 26-27 October 2011:

- Information from Kings Bay AS
- Information from Svalbard Science Forum
 - General information
 - International student camp
 - Progress of flagships
- Status on Geodetic antenna park
- Update from the working group on radio quiet conditions
- Presentation of Northern Research Institute Tromsø (Norut) – application for membership in NySMAC.
- Ny-Ålesund Newsletter / Information centre
- Status for SIOS.
- What do tourists seek in Ny-Ålesund?: A summary of 340 questionnaires on 25 tourist boats.
- Environmental plan for East Svalbard – how is the work proceeding.

Input to Ny-Ålesund Newsletter

If you would like to contribute to future editions of this newsletter, please e-mail nysmac@npolar.no. Any ideas or suggestions for topics are also welcomed. *Editor: Marit R. Pettersen, NySMAC Secretariat. Next edition: June 2012*

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