

# Ny-Ålesund Newsletter

32<sup>nd</sup> Edition – June 2013

## 11<sup>th</sup> Ny-Ålesund Seminar in Rome, Italy 9-11 October 2013

### Seminar description

The seminar brings together scientists who have Svalbard and Ny-Ålesund (78°55'N, 11°56' E) in particular as a base for their research and monitoring activities. The aim of the meeting is to exchange scientific results, advancements, ideas and experiences to inspire each other and develop Ny-Ålesund further.

The seminar wants to foster the following topics:

- Flagship programs
- SSF funded projects
- Implementation of Ny-Ålesund monitoring activities
- NySMAC and SIOS: Status and future developments

### Abstract Submission

Participants are invited to submit one-page A4 abstracts (figures included) no later than **June 30<sup>th</sup> 2013**, to:

[nysmac.11seminar@CNR.IT](mailto:nysmac.11seminar@CNR.IT)

### Registration

Participation to the seminar is free of charge.

On-line registration will be available from June 1, 2013.

See seminar [web-page](#) for more information and registration form.

The National Research Council (CNR), Italy will host the seminar.

## 7<sup>th</sup> Ny-Ålesund Symposium “The Changing Arctic – Opportunity or Threat”



Kings Bay reports that the seventh Ny-Ålesund Symposium was a great success. It was opened on 27<sup>th</sup> of May by Espen Barth Eide, Minister of Foreign Affairs, Norway.

This year's theme aims at contributing to the necessary dialogue between governments, local peoples, and public and private actors in order to meet the new challenges facing the Arctic region. The symposium included the following topics:

- Arctic shipping
- Petroleum development
- Conservation of Arctic biodiversity and ecosystems
- Challenges to indigenous and local peoples

Program and presentations from the symposium can be found [here](#).

## NEWS from Kings Bay



*The old Telegraph building. Photo: Kings Bay AS*

### **Restoring of the old Telegraph building**

The old Telegraph building will be restored summer and autumn 2013. The building will be transformed into a museum, traced back to its days of function (1918 - 1964). Original instruments will be brought up from the mainland and re-installed in the building. The project will be financed by Telenor, Svalbard Miljøvernfond and Kings Bay AS.

### **Visit from the Royal Thai Embassy**

The Royal Thai Embassy visited Ny-Ålesund from March 15-16. Her Royal Highness Princess Maha Chakri Sirindhorn was among the guests. In Thailand, she is often referred to as the "Princess of Information Technology", due to her interest and expertise in applying science for the country's development.

### **Ny-Ålesund Symposium 2013**

Ny-Ålesund Symposium 2013 will be held from May 27-29. The host of the symposium is Mr. Espen Barth Eide, Minister of Foreign Affairs of Norway. The theme of the symposium is: "The changing Arctic- Opportunity of Threat?"

### **New Employees in Kings bay AS**

Mr. Knut-Erik Hanssen is back in Kings Bay after 6 months off, as office manager. Mr. Jonny Sjøvoll is hired as

powerstation manager. Mr. Erik Haug and Mr. Jørgen Sjøvoll Strand are hired as cooks.

### **Kings Bay Marine Laboratory**

The construction work in the basement of the marine lab is in progress. The new lab rooms will open for scientific use hopefully in early July. Parts of these rooms will probably be used for Ocean Acidification projects run by NPI.

### **Construction work**

- Kings bay has signed a contract with the Norwegian Mapping authority to construct the road to the new VLBI antennas at Brandalspynten. The construction work will start in June.
- The cover at the airstrip will be exchanged this summer.
- An extension of the mechanical workshop will be built this summer.
- Two new excavators are bought to Kings Bay. They have a high technology and produce a minimum of exhaust gasses.
- Rehabilitation of the Hotel will be done this summer.
- The construction work at Gruvebadet is finished.

*by Elisabeth Bjerke Råstad*

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## News from the Sverdrup Station

At Sverdrup Station we look forward to a busy summer with up to 22 researchers simultaneously at the station. Most research projects are related to seabirds and also the yearly monitoring of foxes and reindeers as well as several activities connected to the Zeppelin atmospheric station will be conducted. For more details and an overview of projects at the Sverdrup Station have a look at the RiS database found on the [SSF web-site](#).

In addition, the Sverdrup Station will be painted from the outside, and we will start a reconstruction of the building that will result in better outside storage space for scientific equipment, a small wet lab for researchers inside the building and several other small improvements.

In winter we detected some leakage in the roof of the Zeppelin station and also here we are working on a plan to reconstruct the roof – we hope to be able to conduct the work also this summer.

In May, Sverdrup Station organized a climbing course for working in masts and both, Italian researchers, Sverdrup Station staff and members of the Kings Bay technical staff learned how to safely move in heights,

A day before the 17th of May, our new electrical car arrived and we proudly joined the parade through town (photo). It is a Renault Kangoo Z.E. and we are looking forward to test it on our daily trip to the cable car in summer and winter conditions. Until now we are very happy with it and

if you are wondering if an electrical car also would be a good option for your station, contact the station leader Christiane Hübner for a test ride :o)

New regulation concerning the use of boats for commercial purposes since 2013 resulted in busy times for the logistics department at NPI – Steinar and others worked intensely in upgrading boats, taking courses and getting all paperwork

in place. If everything goes as planned our boats and boat drivers at Sverdrup Station will be ready for action according to the new regulation within the next weeks!

Else, one of the engineer positions will be announced in one of these days – if you are interested in working at the Sverdrup Station, please check [http://www.npolar.no/en/about-us/available-positions/!](http://www.npolar.no/en/about-us/available-positions/)

*By Christiane Hübner, station manager*



## AWIPEV news

### The new overwintering team

On the 26<sup>th</sup> April, a new AWIPEV overwintering team has been entrusted the station. As usual, they will occupy their respective position for a whole year.

*From the left: Wiebke Aldenhoff, observatory engineer  
Rudolf Denkmann, station leader  
Guillaume Combescure, logistics engineer*



### First certified GRUAN station: Ny-Ålesund, Spitsbergen

Also on the 26<sup>th</sup> April 2013, AWIPEV has been the world's first measurement station to be certified according to the standards of the Global Climate Observing System Reference Upper Air Network (GRUAN).

See <http://www.gruan.org> for more details

*Dr. Marion Maturilli receiving the GRUAN certificate from Dr. Holger Voemel (Head of GRUAN).*

### 10th Anniversary of AWIPEV, 50th Anniversary of Corbel, and a new boat.

In 2003, Alfred-Wegener-Institut and Institut polaire francais Paul Emile Victor decided to put together their equipment and facilities in a joint Arctic station in Svalbard called AWIPEV.

This year, the station is celebrating its 10<sup>th</sup> anniversary as well as 50<sup>th</sup> anniversary for Corbel station integrated to AWIPEV infrastructures. The arrival of a new small multifunction boat in the fleet, in replacement of timeworn one, is taking service at the same time.

The scientific project list is available on [http://www.awipev.eu/en/science/projects\\_in\\_2013/](http://www.awipev.eu/en/science/projects_in_2013/). 2505 man-days (scientists only) are expected for 2013 with 407 man-days for field support (permanent staff not included)



## NEWS from the Netherlands Arctic Station

This summer, there is a record high research activity at the Netherlands Arctic Station. With new projects from the University of Groningen and Wageningen University, there will be on average 9 people spending the summer in the two London houses. The University of Groningen teams are focusing on barnacle geese and arctic terns. The Wageningen University is studying benthic organisms in the fjord.

Barnacle geese and arctic terns are prominent birds in the village. Moulting geese are aggregating on the high quality vegetation as long as arctic foxes and people don't disturb them. Arctic terns nest on the gravel areas. Dutch bird observers are walking through town with their telescopes to read rings, study behaviour and collect faeces for analysis of diet and hormones. Plastic and metal rings make individual recognition of individuals possible.



An Arctic Tern with a geolocator attached to a yellow ring has arrived in Ny-Ålesund and is waiting for its partner to start breeding. Photo by Brigitte Weiss.

Last year, 20 arctic terns have been equipped with geolocators to monitor migration to the Antarctic. This species holds the record for the longest annual bird migration with a total distance covered of 90.000 km.

These world champions were breeding in the Netherlands on the southern border of the breeding range. The birds in Ny-Ålesund are on the northern border of the breeding range and we are anxious to know if this leads to a new world record. When the birds with geolocators are nesting, they can be caught and the data can be retrieved from the geolocators.

The geolocator study on arctic terns has received support from crowd funding. At this moment, this project has been very successful with €20.000 raised via <http://www.rugsteunstern.nl>

The Netherlands Organisation for Scientific Research has allotted 5 new grants for studies in Ny-Ålesund.

- **Ecological consequences of 400 years resource exploitation on Svalbard** (Hacquebord)
- **From historical data to a prediction of the future for geese on arctic tundra?** (Loonen)
- **Effects of heavy metal contamination on stress response modulation and stress coping abilities in barnacle geese** (Komdeur)
- **Towards monitoring of taxon specific productivity in Arctic coastal phytoplankton** (Buma)
- **Importance of microbial viral lysis over grazing in a changing Arctic Ocean** (Brussaard)

The logistics of these new projects will be supported by AWIPEV.

While the Netherlands Arctic Station is operating in Ny-Ålesund, we will keep a who-is-who page on our webpage: <http://www.arcticstation.nl/inhabitants>. There is a little game to practice learning names of people in town.

By Maarten Loonen, UoG



The starter team in the station. From left to right: Brigitte Weiss, Margje de Jong, Suzanne Lubbe, Tim van Oosten, Isabella Scheiber and Maarten Loonen. Photo by Karoline Bælum (SSF).

## Measuring the Kongsvegen glacier elevation profile using remotely piloted aircraft

By Stian Solbø and Rune Storvold, Norut

Scientists at Norut have been working on methods for measurement of elevation profiles using remotely piloted aircraft (RPA). This will be a valuable tool, especially for remote glaciers and glaciers where it is difficult to perform in-situ measurements.

First results have been obtained by analyzing data from last years joint field campaign between the NFR funded projects Arctic EO and Fram Center Flagship Program Polhavet, where Norut operated the Cryowing RPA out of Ny-Ålesund. The glacier elevation profile was measured utilizing a payload consisting of a laser altimeter in combination with a high precision L1/L2 GPS receiver. In addition, the surface was imaged by a digital camera.

A combination of techniques needs to be applied to measure the elevation profile along the whole glacier. For the lower part of the ablation zone and terminus, the reflectance of the glacier surface is too low to produce reliable laser measurements with our current laser. However, crevasses, cracks and debris make lots of structures with high contrast. Hence, a technique known as multiple view photogrammetry can be applied to generate a digital elevation model (DEM) from a set of overlapping images with known position and orientation. This technique cannot be applied above the firn line, due to lack of visible structures, but in this area the surface reflectance produce strong laser returns.



Figure 1: The Cryowing remotely piloted aircraft operated from Ny-Ålesund. Photo: Torbjørn Houge.

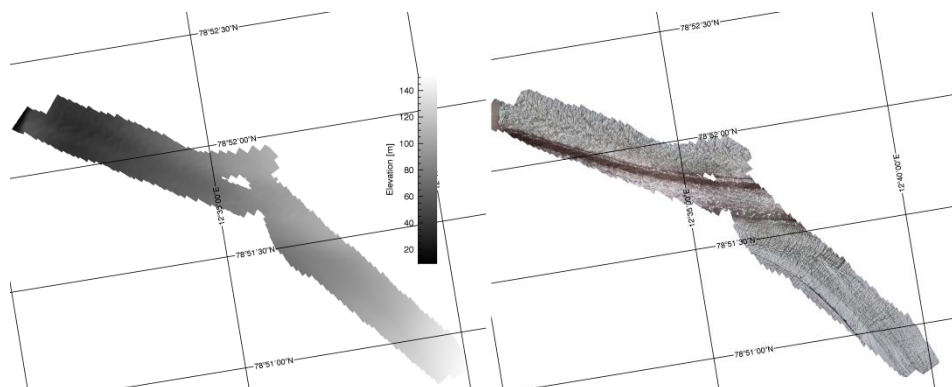


Figure 2: DEM lower part of Kongsvegen (left) and the corresponding orthophoto mosaic (right)

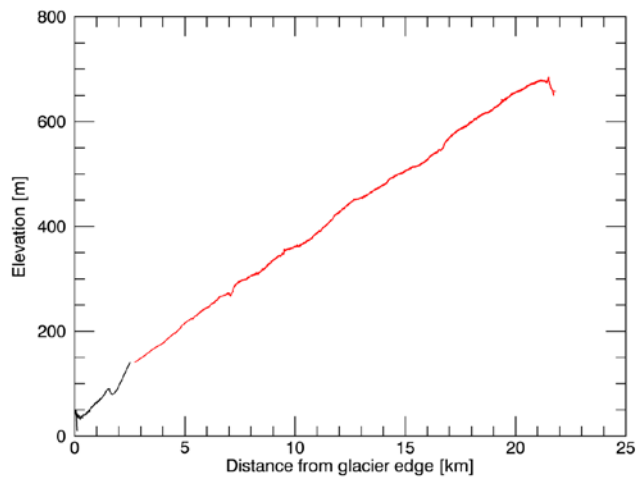


Figure 3: Elevation profile of Kongsvegen. Black and red segments are retrieved from multiple-view photogrammetry and laser altimeter, respectively

The retrieved elevation profile of the Kongsvegen needs to be validated in a controlled experiment, but appears to be legitimate given the available DEM of Svalbard, and knowledge of its accuracy. Norut is currently planning further experiments coordinated with simultaneous ground truth and in-situ measurements, which has to be obtained for a proper accuracy validation, we plan to work closely with the Norwegian Polar Institute and coordinate with their annual measurement campaigns.

Given the range and endurance of a medium sized RPA, such as the Cryowing, the experiment demonstrates that such a system can be a valuable tool for glacier measurements in remote areas like Svalbard, where the only real alternative to measure glacier elevation the ablation zone during the melt season is by manned aircraft. Imagery from repeated observations within a few days can be used to estimate dynamic mass loss when coupled to the 3D modeling and feature tracking. Retrieval of these data is valuable, especially for glaciers terminating in the sea and surging glaciers.

## **Methane: GAME at Svalbard Measurements of methane isotopes at Zeppelin Observatory**

By Cathrine Lund Myhre, Senior Scientist, NILU- Norwegian Institute for Air Research



September 2010, picture taken by Kjetil Tørseth, NILU

The research project **GAME** (**GAME**: Causes and effects of **G**lobal and **A**rctic changes in the **ME**thane budget) includes sampling and analysis of methane isotopes at the Zeppelin Observatory in 2012 and 2013. Methane is an atmospheric compound with abundances determined by natural and man made emissions. It is the second most important anthropogenic climate gas, affecting atmospheric oxidation and air quality, and a main component in the carbon cycle. Processes determining methane's distribution and changes are connected with significant uncertainties. As a result of the uncertainties related to future emissions and changes in the oxidation processes, methane limits the accuracy of climate change predictions. The overall objective of **GAME** is to explain the recent observed increase in atmospheric methane and quantify the effect of realistic future development of atmospheric methane levels. **GAME** will contribute to increased knowledge of the carbon cycle by assessing and quantifying potential methane emissions from permafrost, wetland, biomass burning, ocean, oil, gas and agricultural

sources. Progress will be achieved by multi method approaches: Integration of observations, chemistry transport model (CTM) simulations and radiative forcing calculations. Various methane sources have different isotopic signatures, and from July 2012 daily samples of ambient air have been collected at the Zeppelin Observatory for analysis of the isotopic ratio of  $\delta^{13}\text{C}/\text{CH}_4$ . To better distinguish and describe the various sources bi-weekly samples of air for analysis of  $\text{D}/\text{HCH}_4$  was started in September 2012. The isotopic sampling will continue at least until September 2013. Modelling and long-term atmospheric observations combined with the isotopic measurements will be used to assess the Arctic methane sources. CTM simulations and radiative forcing calculations employing the results will be performed in 2013-2014 to predict and quantify the effects of changing methane levels on Earth's radiative balance.

**GAME (GAME: Causes and effects of Global and Arctic changes in the MEthane budget)** is a 3 year research project funded by the Research Council of Norway under the program NORKLIMA. The project is lead by NILU (Cathrine Lund Myhre) and Cicero is a partner. For more information, see <http://game.nilu.no>.

The isotopic analysis is performed in collaboration with the FP7 EU-project InGOS: Integrated non-CO<sub>2</sub> Greenhouse gas Observation System <http://ingos-infrastructure.eu>.

## New observatory on the way

By Anne Jørgensen, Norwegian Mapping Authority

The Norwegian Mapping Authority (NMA) will be able to measure changes to and motion of the Earth with an accuracy of millimetres from its new geodetic observatory at Ny-Ålesund in Svalbard.



Illustration: Rambøll

This facility forms part of a global network which is crucial for society's satellite-based infrastructure and provides the basis for accurate climate monitoring in the high north.

The Norwegian government appropriated funds for a new geodetic observatory in its revised national planning budget for 2012, while the environmental impact assessment has been approved and planning permission granted. The NMA is now fully engaged in the detailed design of the new observatory.

### Five years to build

Construction is expected to begin in 2013 and will be divided into several phases. The first involves building a new access road to the observatory site.

Plans then call for work on the foundations for the instruments and associated buildings to be carried out in 2014-15. The whole construction process will take five years, with the observatory scheduled for completion in 2018.

This will be followed by three years of overlap with the existing geodetic observatory in Ny-Ålesund to safeguard time series before the NMA shuts down the old infrastructure.

#### **Core network station**

The NMA will use the new facility to gauge the Earth's motion and position through the deployment of several measuring techniques in one and the same place.

That will give it the status of a complete Earth observatory, with equipment which includes twin telescopes, Very Long Baseline Interferometry (VLBI), a Satellite Laser Ranging (SLR) instrument and GNSS and DORIS.

#### **Climate monitoring**

The Global Geodetic Observing System (GGOS) aims to establish 30 installations of this kind on a world basis in order to secure a more accurate and stable basis for monitoring climate, sea level, floods, landslides, earthquakes and melting ice.

Even though Norway and a few other countries are already working to upgrade their geodetic observatories, however, these efforts will not be sufficient to secure global coverage.

#### **UN mandate**

The UN Committee of Experts on Global Geospatial Information Management (UN-GGIM) is accordingly paying growing attention to geodetic observation.

Work in this committee could now lead to a UN resolution on a global geodetic collaboration “to work with all stakeholders to improve a sustained operational global geodetic reference frame and infrastructure, to support the increasing demand for positioning and monitoring applications with associated societal and economic benefits” (from the Doha Declaration, UN-GGIM, 2013).

A UN mandate could encourage a number of other countries to make a commitment to geodetic observation, in the same way that Norway and the NMA are now doing at Ny-Ålesund.

#### **Facts:**

##### ***The NMA's geodetic observatory at Ny-Ålesund***

- *Maps movements in the Earth's surface, planetary rotation, and the Earth's position in space.*
- *Is the northernmost facility of its kind, and forms part of a global network for observation and research*
- *Is being upgraded with new technology, and will combine several geodetic measuring techniques – very long baseline interferometry (VLBI), satellite laser ranging (SLR), global navigation satellite systems (GNSS) – including GPS – and doppler orbitography and radio positioning integrated by satellite (Doris), based on the standard set by the GGOS.*
- *Is due to be completed in 2018.*

##### **Geodesy**

- *The basis for Earth observation*
- *The science of the Earth's shape, motion, gravitational field and changes to these*
- *Fundamental for monitoring climate change and for all mapping*

## **Environmental conditions**

A number of environmental requirements have been set by the governor of Svalbard for the construction and operation of the NMA's new geodetic observatory at Ny-Ålesund.

The NMA must conduct various monitoring programmes for such aspects as bird life and drainage in the area. Cultural heritage concerns are also covered. The NMA will be drawing on specialist expertise in areas like landscaping, restoration ecology and hydrology.

These requirements have been set by the governor as a condition for giving the NMA planning permission in an environmentally sensitive area, which lies outside the zones allocated for permanent research activity in the local area plan.

The choice of the site has been dictated by the need for stable ground conditions, a satisfactory horizon and an acceptable distance from other infrastructure, radio interference and vibration.

## **Fibreoptic link**

Norway's UNINETT group is now preparing to lay fibreoptic cables along the seabed between Longyearbyen and Ny-Ålesund. This link will be important for the research community at the latter site.

Plans call for cable to be laid in the summer of 2014 along a route on the outer side of the Prince Charles Foreland island.

The Norwegian government appropriated funds in May 2010 for laying this cable. Uninett has been given a mandate to negotiate the laying of two cables, which are needed to avoid downtime in the event of faults or breaks.



## Topics from the 39<sup>th</sup> NySMAC meeting

*Topics from the previous NySMAC meeting held in Krakow, Poland, 15-16 April 2013:*

- Status reports from member institutions
- Information from Kings Bay AS
- Svalbard Science Forum work report
- Presentation of Ny-Ålesund Charter – draft document
- Research proposal and application for membership from the Czech Republic
- Flagship programmes – how to proceed with further work
- Presentation of draft land use plan for Ny-Ålesund
- Geodetic Earth Observatory in Ny-Ålesund – status and progress
- New building for Ny-Ålesund Geomagnetic Observatory, University of Tromsø – an update
- Plan to resume ionospheric soundings from Ny-Ålesund – University of Tromsø
- 39<sup>th</sup> NySMAC meeting and 11<sup>th</sup> Ny-Ålesund seminar in Rome, October 2013
- SIOS and Ny-Ålesund, collaboration and priorities for Ny-Ålesund
- Nick Cox was elected new chairman



## Input to Ny-Ålesund Newsletter

If you would like to contribute to future editions of this newsletter, please e-mail [nysmac@npolar.no](mailto:nysmac@npolar.no). Any ideas or suggestions for topics are also welcomed. *Editor: Marit R. Pettersen, NySMAC Secretariat. Next edition: January 2014*

### Info from the NySMACSecretariat:

Ingrid Storhaug from the Norwegian Polar Institute in Tromsø will replace Marit R. Pettersen who will be on leave from 1 July. The [nysmac@npolar.no](mailto:nysmac@npolar.no) e-mail address will be routed directly to her.

### Subscribe/unsubscribe to the Ny-Ålesund Newsletter:

E-mail [nysmac@npolar.no](mailto:nysmac@npolar.no) and write **subscribe/unsubscribe** in the subject field.

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