

# Ny-Ålesund Newsletter

34th Edition – June 2014

## Environmental specimen bank (Miljøprøvebanken)

By Anne Karine Halse and Martin Schlabach, NILU.

In 2012 The Environmental Specimen Bank (ESB Norway) was opened in the CIENS centre in Oslo. The ESB is an archive for the future, containing environmental samples from across the nation. The bank will be an important tool in the fight to combat pollutants both nationally and internationally. ESB Norway contains frozen samples of animals, plants, air and mud from across Norway and the Arctic. The samples become time capsules preserving the present environmental state, so that they can be analyzed using the knowledge of the future.

One of the focus compounds of the ESB are Persistent organic pollutants (POPs). POPs comprise a group of organic compounds, which are known to be persistent, hence have long lifetime in the environment and prone to be long-range transported in the atmosphere (LRAT). By series of evaporation and deposition steps, also called “grasshopping”, POPs are transported from source regions to areas far away from any point source such the Arctic.

Due to the harmful environmental effects of many POPs, regulations on production and use have been implemented, resulting in both regional and global agreements, such as the 1998 Aarhus Protocol and the Stockholm convention on POPs. Therefore, to assess the regulation of “old”/legacy POPs, screen for newly regulated POPs, and monitor POPs of emerging concern, the atmosphere is an essential compartment to explore.

In order to evaluate the effect of the regulations and the contribution of LRAT, only background stations are included for screening approach. The Environmental specimen bank (EBS) includes air sampling at two background stations, i.e. Birkenes located in Southern parts of Norway, and the Zeppelin Station located in Ny-Ålesund. At both of these stations, three different sampling techniques are utilized. By use of both passive and active air sampling techniques, POPs of various physical-chemical properties and thereby transport potential is sampled.

The active air sampler (AAS) collects particle bound POPs, while the passive air sampler (PAS) collects POPs that are more volatile. AAS is located inside the station/observatory and connected to a pump, which draw air through the sampling material. The PAS are monitored on the roof-top of the station and in contrast to AAS, not connected to a pump. Passive air sampling is based on fugacity, where the volatile compounds diffuses from the surrounding air into the sampling media depending on their physical-chemical properties.

As shown in Fig. 1 and 2, PAS includes both the flying saucers (UFOs) (Fig.1) and “bird-feeders” (Fig.2).

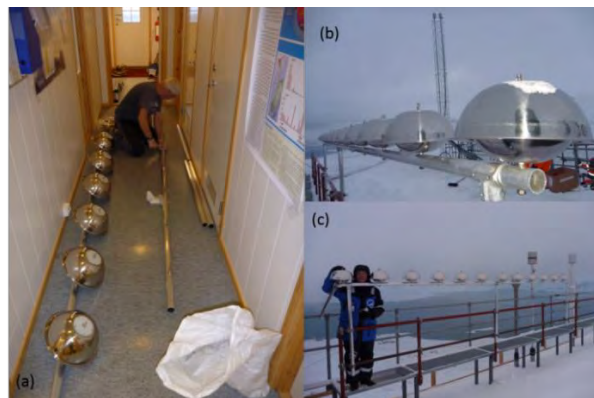


Figure 1: A chain of PAS-PUF and JH. Wasseng-NILU (a), “UFOs”/PUF-PAS deployed at the roof (b), PUF-PAS with JH. Wasseng, which in collaboration with A. Bäcklund (photographer), successfully deployed the samplers on the observatory roof-top (c).

UFOs utilizes the capacity of polyurethane foam (PUF), which is located inside the sampler. PUF has high capacity in sampling semi-volatile POPs in the gas-phase. Figure 2 presents the “bird feeders” (PAS-XAD). They consist of mesh-cylinders filled polystyrene divinylbenzene copolymer (XAD) protected by a metal-housing. XAD has high capacity for sampling the most volatile POPs.



Figure 2: The “bird-feeders”/XAD-PAS from a bird-perspective (the weather mast) (a), the best approach outside (b), all twelve XAD-PAS deployed (c).

PAS was largely successfully installed on top of the Zeppelin observatory, nevertheless some deployment issues occurred. As shown in figure 2b, not all great ideas work out in the real. However, “nothing is impossible, the impossible just requires more time”-attitude in combination with experienced and inventive workers, mounting the PAS devices ended happily.

After three months exposure, all collected samples (AAS and PAS) are shipped to ESB in Oslo via NILU, and new samples are deployed for the new three months at the Zeppelin observatory.

And the sampling will carry on for the next 25 years, hopefully!!

## **Kongsfjorden Ecosystem Workshop 2014 – new views after more than a decade of research**

By Haakon Hop, Norwegian Polar Institute

Kongsfjorden was in focus during a one-week workshop held at the very scenic location of *Hamn i Senja*, 10-17 March 2014. This workshop was important for two reasons: 1) It will summarize and publish the amalgamate of research that has been conducted in Kongsfjorden during the last 10-12 years, and 2) It will set the stage for future Arctic marine research and collaboration in Svalbard, and particularly in Kongsfjorden and the international research facility in Ny-Ålesund.

The workshop involved 60 participants from 9 countries: Austria, France, Germany, Norway, Poland, Russia, Spain, Sweden, and The Netherlands. It was led by Dr. Haakon Hop, Norwegian Polar Institute (NPI), Tromsø, with co-lead Prof. Dr. Christian Wiencke, Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI), Bremerhaven, Germany.

All aspects of Kongsfjorden and its surroundings were presented during the first part of the workshop, with more than 50 presentations ranging from climate, atmospheric influences, glacial input and contaminants - to ecological aspects of pelagic and benthic organisms and food webs. We also had interesting presentations on statistical methods in ecological research by Prof. Michael Greenacre (Spain). The Research Council of Norway/Svalbard Science Forum (SSF) was represented by Marianne Johansen, who talked about SSF, research priorities and future programmes. Finally, Kings Bay AS was represented by Sebastien Barrault, who presented how to bring Kongsfjorden into the Marine Laboratory in Ny-Ålesund.

The presentations were followed by interesting discussions with regard to knowledge gaps, future research needs, and research collaborations. Publication plans were discussed, particularly regarding plans of publishing a Special Issue of *Polar Biology* – entitled *Kongsfjorden ecosystem – new*

*views after more than a decade of research*. Guest Editors will be Christian Wiencke (AWI) and Haakon Hop (NPI), and currently 43 titles with respective authors have been indicated for this issue. In addition, we plan to publish a book of review papers on *Ecosystem Kongsfjorden, Svalbard*. Topics will cover Arctic marine environment, ecosystem structure and function, physiological adaptations, effects of climate and anthropogenic changes, long-term trends and models. Guest Editors will be Haakon Hop and Christian Wiencke, and there are currently 20 titles for such review papers. Note, that it is still possible to add papers by contacting [Haakon.Hop@npolar.no](mailto:Haakon.Hop@npolar.no), with tentative deadline of 1 December for submission of papers.

This Workshop was indeed very successful, and we wish to thank all participants for making this a very unique workshop with good scientific presentations and discussions. We were also very happy with the host management at *Hamn i Senja*, which was an excellent facility to run this workshop. As part of the programme there, we had some interesting excursions to a historical fishing village and fjord sightseeing by small boats.

Finally, we wish to acknowledge our sponsors, which indeed made it possible to arrange this workshop:

*Norwegian Polar Institute  
Research Council of Norway; Svalbard Science Forum, Hav&Kyst  
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Alfred Wegener Institute, Helmholtz Centre for Polar and Marine  
Research  
Kings Bay AS  
DFG-SPP Antarctic Research*

Thanks!  
Haakon Hop & Christian Wiencke





Hamn I Senja



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## **Workshop on collaboration and coordination within the Ny-Ålesund Atmospheric Flagship Programme. Alfred Wegener Institute in Potsdam, 8th - 9th October 2014.**

By Christina Alsvik Pedersen, Norwegian Polar Institute

The Atmospheric Research Flagship programme was initiated as part of the NySMAC science plan for Ny-Ålesund. Now we are revitalizing the flagship with this Svalbard Science Forum supported workshop to create better and more productive collaborations, between atmospheric researchers in Ny-Ålesund from different institutions and between atmospheric researchers at different sites in Svalbard and beyond.

The workshop aim is to bring key scientists studying the lower atmosphere in Ny-Ålesund together to establish or develop collaborations and joint research actions. The workshop will produce plans for new activities, not only new measurements, but also detailed plans for new international and cross-station research building on existing data, planning for better using of ongoing measurements, and new observational needs.

The workshop will address, among others, contributions to the “Analysis of Local Impacts on Air Quality”, pan-Svalbard observational programmes, Svalbard – Greenland connections, and contributions to pan-Arctic programmes.

Finally, the workshop will provide an opportunity to frame the activities of Ny-Ålesund in pan-Arctic perspectives, share experiences with other sites, in Svalbard and across the Fram Strait, laying the foundation for closer coordination and cooperation.

The workshop is open to scientists interested in atmospheric research in Ny-Ålesund or linking that to other sites at Svalbard and beyond. If you are interested in this topic, but did not receive our initial invitation and first circular, please contact the organizing committee:

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## **Workshop on evaluating the current status of the monitoring activities in Kongsfjorden/Ny-Ålesund, Tromsø 21 – 22 October 2014**

By Geir Wing Gabrielsen, Norwegian Polar Institute

A workshop entitled “Towards a coordinated Research and Monitoring Programme for Ny-Ålesund” will be held in Tromsø 21 – 22 October 2014. The objective of the workshop is to evaluate the current status of the monitoring activities in Kongsfjorden / Ny-Ålesund. In the workshop we will discuss future development of existing monitoring sites and research networks in Kongsfjorden/Ny-Ålesund. In the workshop we will also:

- Identify important parameters for environmental monitoring in Ny-Ålesund and decide who will be responsible for the collection of these baseline data.
- Evaluate scientific models for long-term monitoring and how these can be implemented in Ny-Ålesund.
- Consider how a monitoring programme for Ny-Ålesund will comply with and achieve the goals of SIOS; i.e. improved collaboration between research stations and simplified access to research results.
- Identify areas that should be the focus for future collaboration

People who want to contribute and take part in the workshop should contact Geir Wing Gabrielsen ([geir@npolar.no](mailto:geir@npolar.no))



## News from the NIPR Rabben Station

By Masataka Shiobara, NIPR, Japan, and Toshiaki Takano, Chiba University, Japan

A new cloud radar named FALCON-A (Frequency Modulated Continuous Wave Radar for Cloud Observations in the Arctic) has been developed by Chiba University and National Institute of Polar Research (NIPR), under the Arctic Climate Change Research Project in the Green Network of Excellence (GRENE) Program of Japan, and installed in a 20-ft green container placed at the NIPR Rabben Station in September 2013 (Fig.1).

FALCON-A includes two 1m diameter antennas for transmitting and receiving 95 GHz (W-band) wave with high sensitivity and high spatial resolution (10 - 70 m at 5 km height). Doppler measurements with a  $\pm 3.2$  m/s velocity range and one dimensional scan within  $\pm 10^\circ$  around zenith are available.

The cloud radar is acquiring cloud reflectivity profiles on a 24-hour continuous basis since September 2013. The first data from cirrocumulus observation on 16 September has shown fine structures in the cloud by its good performance in resolution and sensitivity (Fig. 2, Fig. 3). From preliminary analysis combined with the result from the Micro-Pulse Lidar polarization measurement, different features found in two layers at 4-5 km and 5-6 km height seem to reflect the difference of microphysical property of cloud droplets and the glaciation/precipitation processes of mixed phase clouds.

Cloud measurements with FALCON-A is expected further to contribute not only for the GRENE Arctic Project but also for surface validation of cloud retrievals from Earth-CARE (Earth Clouds, Aerosols and Radiation Explorer) satellite that is under development as a JAXA-ESA joint project.

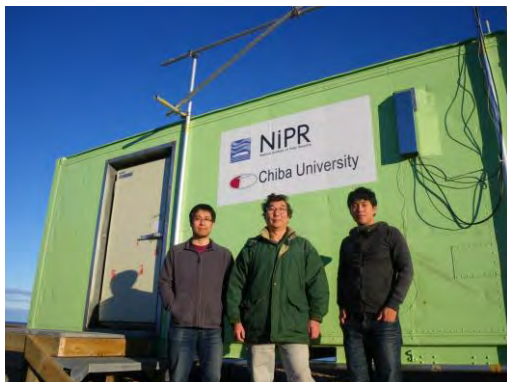


Fig.1. Chiba University Radar Team in front of the cloud radar green container at Rabben



Fig. 2. Cirrocumulus clouds observed on 16 September 2013

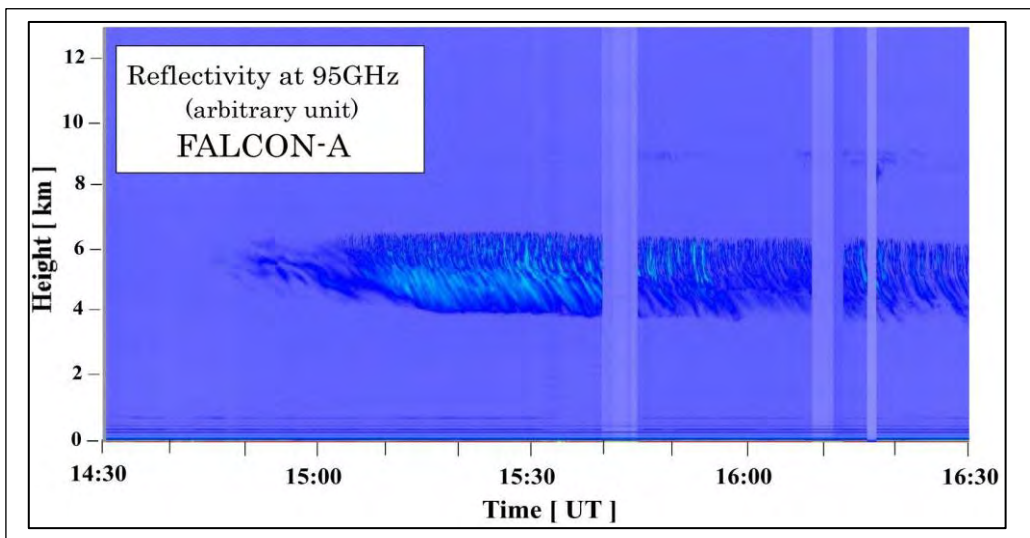


Fig. 3. Cloud reflectivity profile from FALCON-A at Rabben

## News from the Sverdrup Station

By Christiane Hübner, station manager

### New faces at Sverdrup Station

Since March, the station has a new logistical engineer, Christian Zoelly. He comes from Switzerland and has background in mechanics and economy. He has been living in Norway since two years and has worked as Svalbard guide and snow scooter mechanic. Currently, he is preparing bikes and boats for the busy summer season and soon Wojtek Moskal will join him in providing boat transport and logistical support for the research community in Ny-Ålesund.



Christina A. Pedersen is the new research coordinator for NPIs research activity in Ny-Ålesund. Although she is new in the position, she is not new to Ny-Ålesund, as she has a long research career behind her, focusing on snow, optics and black carbon among others in Ny-Ålesund. She is located at NPIs main office in Tromsø, but will be visiting Ny-Ålesund occasionally.



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## News from Kings Bay AS

By Sébastien Barrault, Kings Bay AS

### Summer modules in KBML

Kings Bay Marine Lab is full this summer. Offering maximum space and comfort to marine biologists remains a high priority. Kings Bay has therefore extended some of the marine laboratory facilities outside its usual premises. It is divided in three sections: A sea water arena, a fresh water area for cleaning equipment and a semi-outdoor workshop connected to power and internet.

The temporary installation will be deployed every year according to the scientific needs.



Sea Water Arena: Ten tanks of 500 liters welcome fishes during recovering period after examination inside the lab. In addition ornithologists have placed a swimming pool equipped with underwater cameras to observe little auks feeding behavior. Photo: Kings Bay

### Inventory of scientific instruments

Kings Bay has entered the second phase of the large registration of instruments, enclosures and webcams. The area of action includes now Brøggerhalvøya, Blomstrand and Kongsfjorden.

Early this year the stations provided information about the scientific equipment deployed within Ny-Ålesund.

The main goals of the projects are to list and publish about all instrumentation operated from Ny-Ålesund, to preserve long-term monitoring enclosures and to clean up the so-called scientific garbage.

**Please report by November 1<sup>st</sup>.**



Research adviser, Sébastien Barrault registering old scientific installation on Brøggerhalvøya Photo: Kings Bay / Gunn Oftedal

### Ny-Ålesund – a hub for Climate issues

Sixteen nations were represented among the 48 delegates who participated in the 8th Ny-Ålesund Symposium from May 26th to May 28th. Themes build on challenges and questions facing the Arctic and northern regions that have global consequences, such as climate change. This year's theme was "Breaking the climate stalemate", and host was Ms. Tine Sundtoft, Minister of Climate and the Environment.



Among the delegates and participants were several UN Special Envoys for Climate Change, as well as Chairman of the IPCC, Dr. Rajendra Kumar Pachauri, Ms. Christiana Figueres, Executive Secretary of the UNFCCC and Felipe Calderón, former President of Mexico, now Council leader, Global Commission on the Economy and Climate. (photo: Kings Bay AS)

Early July, Norwegian Minister of Foreign Affairs Mr. Børge Brende, brought his French colleague, Minister of Foreign Affairs and International Development Mr. Laurent Fabius, for a quick visit to Ny-Ålesund. Foreign Minister Fabius is host to the next UN Climate Change Conference, COP 21, in Paris in December 2015, and both ministers had the opportunity to experience for themselves the impact climate change has had on Svalbard's nature and wildlife.



Laurent Fabius and Børge Brende Photo: Kings Bay / Anne Merete Bekkevahr)

### Opening of the Telegraph station

Built in 1918 the telegraph station quickly became the heart of Ny-Ålesund and the only contact for the inhabitants with the rest of the world. Regarded as one of the most precious buildings of the community, the telegraph reopened on 26<sup>th</sup> May 2014 after a summer with intensive renovation. The original radio equipment operated during the 60s was recovered and brought back to Ny-Ålesund. Today, visitors can not only appreciate the old communication devices but can also send modern telegram via internet.



Photo: Telemuseet / Laila Andersen



## News from Svalbard Science Forum

By Marianne Johansen, SSF

### The new RiS Portal launched in May

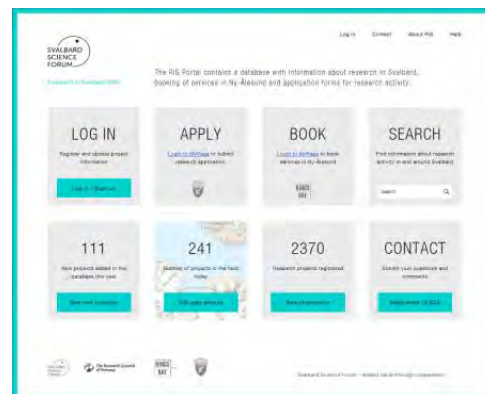
The Research in Svalbard (RiS) database was re-launched in May with brand new services added. One advantage with the new RiS Portal is the user-friendly design. Another obvious advantage is that one can store multiple authorization application forms together in RiS compared to previously, when researchers who were seeking to perform fieldwork in Svalbard had to fill in the same information in up to three applications – one for RiS, one for the Office of the Governor of Svalbard and then one for the research station if a research stay in Ny-Ålesund was planned. A third advantage is that there is open access to this important knowledge database for anyone seeking information about research in Svalbard.

#### RiS Portal features:

- Open access
- Everything in one place
- Registration of projects and scientists
- Bookings for Ny-Ålesund
- Applications to the Governor
- New map and statistics view
- Information about field activity and data
- Coordination and cooperation tool

The new map view provides a unique overview of the vast research activity and will enable scientists to find cooperation partners, making it easier to coordinate both logistics and field work. Also the metadata and publications added by RiS users will add value to the database.

Visit the RiS Portal at [www.researchinsvalbard.no](http://www.researchinsvalbard.no)



## News from the Norwegian Mapping Authority

By Frode Koppang

After an extraordinary snowy winter, The Norwegian Mapping Authority (NMA) now continues the road construction down to the new station at Brandallaguna. The actual roadwork is performed by Kings Bay AS.

All persons in the project, who will work at the construction site, will participate in a *green course*. This is the same course as we provided last year in Ny-Ålesund.

The course will be held in collaboration with NINA (Norwegian Institute for Nature Research) and focus on, among other things:

- How to avoid unnecessary damage to the terrain
- Temporary storage and return of soil
- Reversal and regrowth of top soil
- Terrain design
- How to relate to the field of research and cultural heritage in and around the plant site
- The governors conditions

The road will be completed in September. Work on the new station area will begin in October, and will be conducted by Veidekke Arctic AS. Concrete foundations and building of technical instruments will now be built. Construction will continue throughout the winter and is scheduled for completion in September 2015. The activities will be closely monitored by NMA during the entire period. This is done through presence, site inspections, photo documentation and more. The Governor has given restrictions for noisy construction work near Brandallaguna during the summer period (May 15<sup>th</sup> - August 25<sup>th</sup>), and also clear restrictions regarding pollution and waste in the area. The Norwegian Polar Institute, The University of Groningen in collaboration with NINA will continue with bird monitoring in and around the construction site (June to August), as last summer. The two new VLBI antennas will be delivered during spring 2016 and put into (test-) operation the following year.

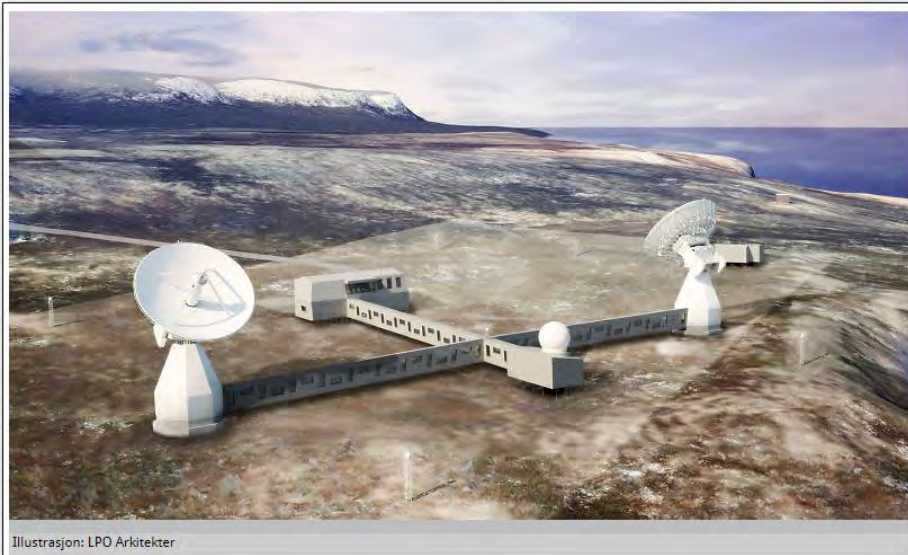
#### Facts:

##### 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.

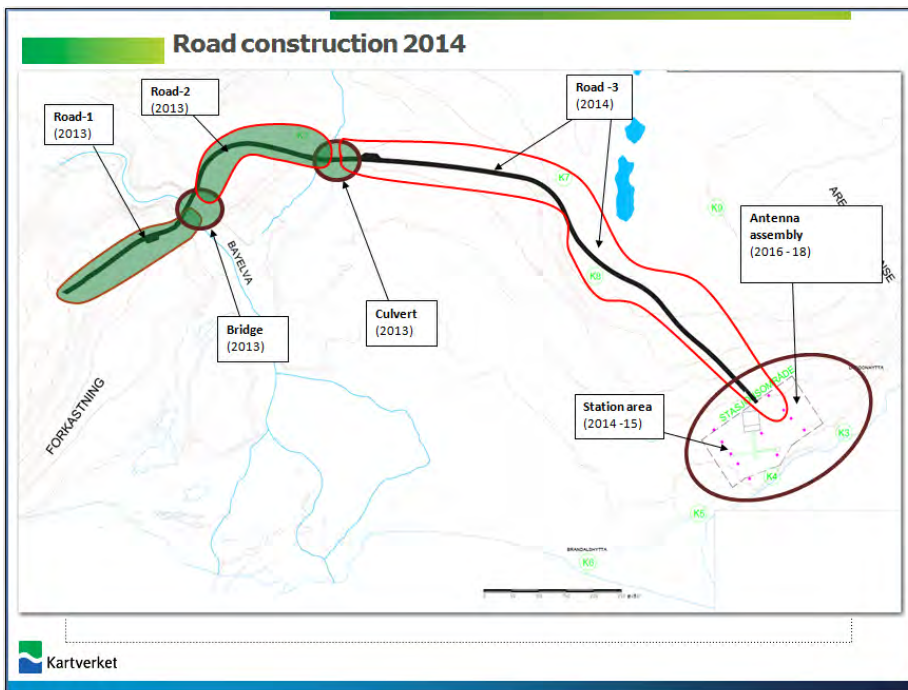
##### Geodesy

- 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



Illustrasjon: LPO Arkitekter

New Geodetic Earth Observatory



Green course for the construction workers on site



## Topics from the 40<sup>th</sup> NySMAC meeting

*held in Helsinki, Finland, 7-8 April 2014:*

- Presentation of IASOA (International Arctic Systems for Observing the Atmosphere)
- CICC13 (Collaborative Investigation of Climate Cryosphere Interaction)
- Report about ICARP III
- Station North and links with Svalbard
- Presentation of INTERACT (International Network for Terrestrial Research and Monitoring in the Arctic)
- Information from Kings Bay AS
- SSF work report
- Presentation of “Land use plan for Ny-Ålesund”
- Research plan 2014 and Kings Bay’s work plan for the coming summer.
- Media in Ny-Ålesund
- Management plan for the national parks in West Spitsbergen and bird sanctuaries
- Arctic Mars Analog Svalbard Expedition (AMASE).
- Limits of acceptable changes in Ny-Ålesund
- The Norwegian Animal Experimentation Committee (NARA) – application procedures/deadlines.
- Status from member institutions
- SIOS and Ny-Ålesund, collaboration and priorities for Ny-Ålesund
- 41<sup>st</sup> NySMAC meeting in Goa, India

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## Input to Ny-Ålesund Newsletter

If you 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: Ingrid H. Storhaug, NySMAC Secretariat. Next edition: January 2015*

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