

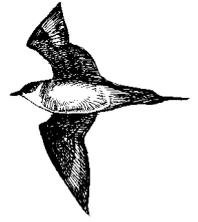
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Ny-Ålesund Newsletter



4th edition
Nov 1998

The Environmental Impact Assessment for Ny-Ålesund

The final version of the “Environmental impact assessment; Ny-Ålesund international scientific research and monitoring station, Svalbard” is now available in final printed form (Norsk Polarinstitutt meddelelser, No. 157; 1998).

The report is written by the EIA team John Shears, Fredrik Theisen, Are Bjørdal and Stefan Norris synthesizing a large amount of work performed mainly by them but also of work performed by many other institutions and individuals. NySMAC is grateful for all this work which will play a very significant role for the development of Ny-Ålesund during the coming years.

The objectives of the EIA were to:

- Examine the impact of human activities on the environment at Ny-Ålesund;
- Examine the conflicts between the various activities;
- Recommend actions to reduce impacts and conflicts in order to maintain and restore the area as a near pristine site for environmental research and monitoring.

The EIA report is a long and important document that cannot easily be summarized. Some of the highlight results are that the impact of human activity is shown to be high with a 50% increase in the area of tundra degraded during the past decade (116 ha in 1997 compared to 78 ha in 1986). Other impacts of note are widespread disturbance of sediments in Kongsfjorden by shrimp trawling, polycyclic aromatic hydrocarbons leaching from the rubbish dump, wader habitat loss

due to station activities and reindeer overgrazing, and persisting contamination from two major diesel fuel spills (1986 and 1990).

The assessment identifies a few potential sources of conflict between activities in Ny-Ålesund. Three noteworthy problems are:

- The disturbance of activities in general on the measurements at the Zeppelin station through local air pollution is one.
- The commercial shrimp trawling decreasing the value of Kongsfjorden as a scientific research and monitoring site.
- Active emitters of electromagnetic radiation (light and radio waves) disturb the opportunities for passive instruments to work in an uninfluenced environment.

The EIA leads to the formulation of a twelve point Environmental Action Plan (EAP). The draft EAP has already been presented in the Newsletter. The final version EAP is adopted by NySMAC as a recommendation for the future of Ny-Ålesund. The EAP includes several recommendations regarding, ways to increase information flow to all parties, refined management methods, and rules for general human activities in order to retain the special scientific and cultural heritage qualities of Ny-Ålesund. One important recommendation is to establish the Kongsfjorden area, including the Brøggerhalvøya, as a combined terrestrial and marine “scientific research area”. Complete implementation of the EAP will take some time and will require the collected efforts by everyone working and visiting Ny-Ålesund.

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NySMAC and Kings Bay are not idle. Many of the points raised in the final EIA/EAP are already being remedied or adopted, as we continue to develop the community to be one of the absolutely leading international scientific research and monitoring stations in the Arctic.

Kim Holmén

News

SvalRak: **ISAS SS-520-2 Rocket Experiment in the end of year 2000**

The main objective of the ISAS (The Institute of Space and Astronautical Science) SS-520-2 (two-step rocket) rocket experiment is to study ion heating/acceleration processes and associated ion outflowing phenomena (especially, the altitude profile) over the dayside cusp/cleft region. The cusp/cleft region is a special region in which magnetic field lines are connected through the magnetopause to the interplanetary space, and hence the solar wind plasma can make direct access to this region. Probably owing to the intense precipitation of the solar wind electrons and ions from the solar wind (magnetosheath), a part of cold ions in the upper atmosphere may be heated and/or accelerated, but details of the physical processes have not yet been identified. Some scientists argue that the heating occurs in a very limited region in latitude and local times near the cusp region. The altitude range is also limited, probably above 1,000 km. Therefore; the rocket for this purpose has to be launched to traverse this key region. The cusp location varies depending on the solar wind condition, but statistically it is most probably located over Svalbard.

Svalbard is the only possible launch site of the SS-520-2 rocket for the above purpose. The launch condition has to be decided based on the solar wind condition and ground-based observations to identify the cusplocation. We wish to have a semireal time monitor of the solar wind condition through the web page of Internet.

That is the reason why the SS-520-2 rocket has to be launched from Svalbard. It is noted that Caper (the 4 stage BlackBrant-XII that will be launched from Andøya Rocket Range in January 1999) has the similar purpose, but the Caper rocket is planned to flow horizontally at an altitude of 1,400 km over Svalbard. The SS-520-2 rocket is planned to traverse the source region and get information on the altitude profile at lower altitudes. Therefore, the two rocket experiments will be complimentary.

The New Research Station for Norwegian Polar Institute in Ny-Ålesund

One week with strong wind delayed the construction work on the framework of the new research station. But by the 12th of November the roof was finished and the outer wainscot is also nearly completed. Nothing indicates any further delays and completion of the building according to plan will be end of February. During March they will start to move into the new station. The official opening will take place in the middle of April.

The station has three floors, which give the net area of 712 m². The first floor is assigned to the permanent staff and consists of offices, laboratory, and storeroom for field equipment and accessories. The second floor consists of 12 scientist offices, two workshops for mechanics and electronics. The lounge is also placed on the second floor and this living room has a spectacular view towards Kongsbreen. On the third floor there is an instrument room and a calibration room. These rooms are equipped with one dome for ozone measurements and one dome for aurora measurements.

All owners of new and old installations will have to sign a contract with NPF. Before accepting movement of old installations they will go through a critical evaluation.

When the station is finished, the Norwegian Polar Institute will have the opportunity to offer scientists the best research facilities in the arctic. The new station will have a very good infrastructure for instrumentation and data communication.

New instrument in the NDSC observatory

They are going to install a new instrument in the NDSC (Network for Detection of Stratospheric Change) observatory. It is an instrument for the observation of stratospheric water vapor. The principle is the same as for the instruments for the detection of stratospheric ozone and chlorine monoxide that have been installed in 1994. They observe the thermal radiation of the molecules in the stratosphere at frequencies in the Microwave region. The background for the installation of the new instrument is that a significant increase in stratospheric water vapor has been observed during the past few years. Water vapor in the stratosphere has a direct influence on the ozone layer as well as on the temperature structure of the stratosphere.

Ongoing activities at the Japanese Station during the winter season 1998/1999

The research topic this winter is atmospheric science. Main topics are a study of aerosols, clouds and precipitation in the stratosphere and troposphere. Polar stratospheric clouds (PSCs) are now famous, after their role for the ozone hole formation was identified in Antarctica. There are many types of PSCs. Some structures have been understood but some have not. The observation will continue every winter to better understand the PSCs structures.

The science teams are also interested in the aerosols in the troposphere and would like to know the aerosol origin and mechanisms of chemical reaction in the transportation. Moreover, clouds-aerosol inter-action processes they also would like to understand. For this purpose they will measure aerosol size distribution, chemical species in the aerosols, contents of column liquid water, column water vapour and column solid phase H₂O. In addition they also will measure chemical species in fallen snow and watch snow particle size distribution and types of snow particles. Their observation started in early December 1998 and will end around the end of March 1999.

New station at Zeppelinfjellet

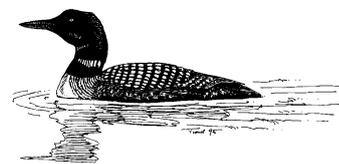
In next year's budget the Norwegian Polar Institute (NPI) has been allotted funding for construction of a new atmospheric chemistry station at the top of Zeppelinfjellet. The reason for building a new station is that the old one is too small and does not meet the needs that are required for such a station. This station is considered to be one of the most important reference stations for investigation of global air pollution. Engineers from NPI's research station operate the station daily.

The major users of the Zeppelin station are Norwegian Institute for Air Research (NILU) and Department of Meteorology, Stockholm University (MISU). They have the main responsibility for research performed at the station. In addition the station is a 'Large Scale Facility' under the EU-commission which makes the station available for international scientists.

The following persons have participated in a working group responsible for description of the new station:

Tor Ivan Karlsen, station manager NPI
Jon Børre Ørbæk, scientist NPI
Kim Holmén, scientist MISU
Harry Beine, scientist NILU

The Norwegian Polar Institute aims to build a very modern atmospheric chemistry station. One of the most important elements is that the station is build of low emission materials in order to avoid measurements being polluted. According to plan the station will be completed during 1999.



Ny-Ålesund Diary

February 1999

- 10th NySMAC-meeting will take place in Corsica.

April 1999

- Inauguration of the new Norwegian Research Station.

Calendar of Arctic Meetings

At the fall meeting of the American Geophysical Union (AGU) in San Francisco (December '98) both Drs. Harry Beine and Frode Stordal will give invited presentations in a special session on Arctic Tropospheric Chemistry.

For a comprehensive listing of published meetings, look at the *International Survey of Arctic Meetings* at <http://www.npolar.no/iasc/sam.ht>

Staff News

Alfred Wegener Institut (AWI):

Nicole Spelten succeeded Christine Weinzierl as the station engineer at the Koldewey Station from 23 August.

Kings Bay AS (KB):

Aanon Bernt Winge Grimnes was appointed project director from 15 August.

Norwegian Institute for Air Research (NILU):

Harry Beine will spend 9 months as guest scientist at the Atmospheric Sciences Department of the University of Washington. He continues to be NILU's contact during this time. Contact address:

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Publications

The Arctic and Global Change - Multidisciplinary approach and international efforts at Ny-Ålesund, Svalbard

Proceedings from the 4th NySMAC seminar 5-6 March 1998, Italy.

The publication is available from CNR and the NySMAC Secretariat.

Research in Svalbard 1998

A yearly information bulletin based on contributions from scientists working in Svalbard. Available from the Norwegian Polar Institute and on <http://www.npolar.no/ris/>

Ny-Ålesund - International Research at 79°N

3rd revised edition. Published by the Norwegian Institute in co-operation with Kings Bay AS.

The Ny-Ålesund Safety Guide

By Nick Cox, NERC (2nd edition 1998)
This NySMAC publication is an introduction

to safety in Ny-Ålesund and its surroundings. The guide is obtainable in Ny-Ålesund from Kings Bay AS and NP Research Station.

NySMAC Internet Homepage:

<http://www.lby.npolar.no/nysmac/>
As well as a general introduction to Ny-Ålesund and to the work of NySMAC, this site contains the complete contents of the *Ny-Ålesund Newsletter*, links to the homepages of the NySMAC member institutions and a *Ny-Ålesund Publication List*.

Environmental impact assessment - Ny-Ålesund international scientific research and monitoring station, Svalbard

By J. Shears, F. Theisen, A. Bjørndal and S. Norris, 1998. NP: Meddelelser no. 157

Measurements of CO in the high Arctic

By Harry Beine. Accepted for publication by *Chemosphere*, October 1998.

Measurements of HONO at Svalbard

By Beine, Allegrini, Iannello and Sparapani. Invited presentation at AGU, San Francisco, December 1998.

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