The French-German Arctic Research Base AWIPEV winter 2012/13

Report to the NySMAC Meeting in Cracow, April 2013

The French-German research base AWIPEV was fully operational during all winter. Base personnel: Sebastien Barrault, Winfried Markert, Pierre Lizee.

Highlights:
During January and February oceanographic work was carried out during the polar night by IfM/GEOMAR Kiel with the help of NP, AWI, and Kings Bay. A Polar Circle boat, modified with a small crane, is used for a total of 12 cruises on Kongsfjorden to collect overwintering pteropods with net samples, CTD profiles, and water samples with a Niskin bottle down to 300 m depth. Favorite weather and ice conditions support the project. The project leader, S. Lischka, expressed a big compliment to Kings Bay, NP, AWIPEV for the successful operation.

Further Project reports:

- No ozone balloon campaign due to warm stratosphere without big O3 loss
- Under Water Observatory (UWO) operative: first dark season covered
  A repair operation involving divers could successfully be carried out in February.
- SSF funded project (Arctic Field Grant): In cooperation of AWI, U. Hannover, NILU, NPI:
  Determination of reflected properties from snow surfaces in Svalbard RiS ID 6160

Upcoming projects

- Krill season started, thanks to KB for providing Teisten already in April!
- Diving for algae and benthic ecology (SCALA, cockles) will run from May to early October
- Several projects come repeatedly during the light season,
  e.g. UWO / fish, boundary layer investigations, SCALA (APOLOBIS)

Anniversary 10 years of AWIPEV to be celebrated 26./27. April in Ny-Ålesund

Planned base occupancy:

- 33 AWIPEV projects (6 France, 27 Germany)
- 14 projects all year (automated or operated by base personel)
- Ca 3000 person days for 2013 currently planned

LOGISTICS NEWS :
New Boat "Jean Floc'h" to be operative late April / early May 2013
A 7 m aluminum boat, w. small crane, winch for diving and oceanographic work, replacing a Buster

Corbel Station getting finalized with electrical work becoming completed end of April, scientific projects starting there in May and during summer until September.

Status report of China

In 2013, 16 programs have been approved by CAA in March. Routine observation and summer investigation have been and will be done in most months. There are more than 47 persons will work at Yellow River Station from April to next year March. As China is carrying out the Polar Environmental Comprehensive Investigation and Assessment Program, more scientists will be dispatched there to work. As usual, most scientists will go to Yellow River Station in July and August. And one person will insist to work during the winter time. In this season, there are no more field construction work. And as the new boat can ‘t be arrived the station soon, that we have to ask the assists from Norway Polar Institute for transportation the scientists to glacier.

The detailed projects is as follow:

1. The monitoring and studies of glaciers Austre Lovénbreen and Pedersenbreen, Ny-Alesund, Svalbard
2. Research on Microbial Community in Spring Plant Quadrats Established over Kings Bay of Svalbard, Arctic
3. Satellite tracking station upgrade and GPR mesaurement
4. Promotion of China-Norway Collaborative Study on Arctic Physical Oceanography based on the Chinese Polar Expedition Project
5. Investigation of ecosystem and environment at Yellow River Station area in 2013
6. Study on the diversity of protease-producing microorganisms in Ny-Alesund
7. Planktonic ciliate abundance, biomass and predation by calanoid copepod in Kongsfjorden
8. Regular maintenance and reinvestigation of observation quadrats in Ny-Alesund, Arctic
9. Diversity and medicinal activities of endolichenic fungi from lichens in Ny-Alesund, Svalbard
10. Biodiversity research and coverage review on lichen in quadrats, Ny-Alesund
11. 2013 Annual Arctic Yellow River Station Atmosphere, Space Environment Observation
12. Ionospheric observation at Chinese Arctic Yellow River station, year 2013
13. Impact of glacial melt-water on organic nitrogen and trace iron in Kings Bay
14. Long-range transport mechanism of perfluorinated compounds in Arctic
15. Autonomous glacier monitoring and soil carbon-flux observation at Arctic Yellow-river station
16. Strategic Policy of Polar Science

CNR ARCTIC STATION
DIRIGIBILE ITALIA

Department of Earth System Science and Environmental technologies

Report on the activities from January to April 2013

Logistics

Renovation works at the Gruvebadet Laboratory and opening of second room, with new space available for guests and collaborations with International research teams.
Training of a young station leader (2 Ph. D. students will cover a 6 month period continuously).

Research

Beginning of atmospheric sampling activities at Gruvebadet Laboratory in the framework of the 2013 campaign, for the study the chemical markers of environmental response to climate changes and anthropogenic impact and the characterization, transport processes and transformation mechanisms of chemical species associated with the aerosol in the Arctic region.

Outreach

Preliminary visit and beginning of shooting for new 3D film on Umberto Nobile and the Red Tent in the area of Ny-Ålesund.

Mandays of scientific personnel	90
Mandays of logistic personnel	44
Guests	12

Projects

RIS 3693 - Gruvebadet Atmospheric Laboratory Project (GruveLab) - PI Roberto Udisti, University of Florence

RIS 6185 - Arctic Sea Ice and HAlogen Deposition: investigation for a new paleoclimatic tool (ASIHAD) - PI Jacopo Gabrieli, IDPA-CNR

Other ongoing projects based on continual measurements performed automatically through the year in Ny-Ålesund are:

RIS 3471 - Climate Change Tower Integrated Project (CCT-IP) - PI Vito Vitale, CNR-ISAC

RIS 3297 - Ionospheric Scintillations Arctic Campaign Coordinated Observations (ISACCO) - PI Giorgiana De Franceschi, INGV

RIS 3304 - Sun-Earth Interaction: Joint High-Latitude Aurora Observations from Svalbard and North-East Greenland, with ITACA² Twin All-Sky Cameras - PI Stefano Massetti, INAF

RIS 3435 - Cloud Effects on UV Irradiance Measurements (CEUVIM) – PI Claudio Rafanelli, CNR IDASC

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The Summary of Korean NySMAC Report

Korea Polar Research Institute (KOPRI)
Research Activities of the Dasan Station at Ny-Alesund in 2013

1. Overview

Korean scientists are scheduled to visit the Dasan Research Station at Ny-Alesund for scientific research activities and outreach program. And all of them in this season have registered in the Svalbard Research Database their scientific research activities schedule at Ny-Alesund.

	Project Complete Name	**Num. of Person**	**Duration**
1	Role of the neutral atmosphere on the ionospheric electron densities in the polar upper atmosphere	2	22
2	Biodiversity and Cold-adaptation of the Arctic Organism	7	10
3	Study on the Ecological characteristics and changes of Arctic Permafrost	11	34
4	Establishment of Environmental Changes Observation and Technical Development in the Arctic Permafrost	2	25
5	Study on the species diversity of copepods using morphology and molecular barcodes	5	17
6	Korea Outreach Program – Pole to Pole Korea	15	14
7	Inspection and maintenance	3	5
Sum**		45	127days

The summary of each of research projects in 2013

A. Role of the neutral atmosphere on the ionospheric electron densities in the polar upper atmosphere

This project focuses on Identifying the effects of the neutral atmosphere, including the mesosphere and thermosphere, on the changes of the ionospheric electron densities near the Antarctic Peninsula and understand the effects of the geomagnetic storm on the neutral atmosphere in relation to the ionospheric storm

B. Biodiversity and Cold-adaptation of the Arctic Organism

This project is to study the biodiversity of various organisms around the Korean Arctic Research Station. KOPRI will investigate and sample plants, mosses, lichens, small animals and microorganisms from land soils, sea and fresh water.

C. Study on the Ecological characteristics of Arctic Permafrost

The purpose of this project is to understand the physical-chemical-geophysical characteristics of permafrost and to understand the function of soil microorganisms and plants in Arctic permafrost, as a biological factor of greenhouse-gas fluctuations.

D. Establishment of Environmental Changes Observation and Technical Development in the Arctic Permafrost

This project is to study the environmental change in Arctic permafrost.
According to climate changes, KOPRI will research Ecological environment system. And, this research project will help to develop the multilateral analysis and activities around the Arctic area.

E. Korean Outreach Program - Pole to Pole Korea -

The purpose of this program is to raise public awareness on polar environments and research activities in the Arctic area by following activities;

i. Orientation about Svalbard and research stations in the area
ii. Marine Laboratory and station visit
iii. Observing and discussing the global warming issues and environmental protections
iv. Experience of scientific activities such as ice drilling, observing melted ices

Summary of Research Activities at the Indian station during 2012-2013 and plans for 2013-14

During the year 2012-13, the Indian station "Himadri" was manned for 185 days and a total of 25 scientists visited Ny-Ålesund to carry out studies under 10 different projects. Brief details of the projects are available in the RiS database. In order to optimally utilize the resources and to have a focused and sustained research at the Arctic, NCAOR in consultation with the national experts have identified three major thrust areas for Arctic research. It is envisaged that all the ongoing and new scientific projects will be integrated into these thrust areas.

1. Long-term monitoring of Kongsfjorden System
2. Precipitation and aerosol studies.
3. Glacier mass balance and snow-air flux studies

For long-term monitoring of Kongsfjorden, CTD surveys coupled to water column sampling for basic chemical (like nutrients, dissolved oxygen etc.) and biological parameters (phytoplankton, bacteria etc) were carried out from May 2012 to October 2012 at an interval of 15 days from 16 pre-decided stations spread along and across the fjord. These observations started in 2011 and we look forward to continue similar observations in the coming summer.

Indian researchers have been attempting to address accumulation/ablation and mass balance of the Vestre Broggerbreen glacier during summer and winter. Researchers have also conducted DGPS and GPR surveys on the glacier. There exist some logistic challenges to reach the accumulation zone of this glacier. In the coming summer, in addition to ongoing field plans, it is also proposed to conduct a feasibility study of initiating mass balance studies of the Feiringbreen glacier.

Since the summer of 2008, measurements of atmospheric aerosols are being carried out by Indian scientists at Ny-Alesund. With logistic support from the Italian base, a Nephelometer and an Aethalometer have been operational at Gruvebadet for over an year. Subsequent to re-fabrication notice at Gruvebadet, these equipment are currently placed in the cabin *Siri Furtebu* near to Gruvebadet. In the coming years Indian scientists are planning to install such instruments as Micro Rain Radar, Microwave Radiometer Profiler, Ceilometer etc to monitor the precipitation and to understand the role of aerosol and precursor gases in direct radiative forcing over the Arctic. Due to space constraints at Himadri, it is proposed to house these equipments in a separate laboratory at Ny-Alesund. The matter is under discussion with Kings Bay AS.

During the summer of 2013 through the spring of 2014, it is proposed to operate the station from late June to November and again during March-April 2014. It is anticipated that a total of 27 scientists will be visiting Ny-Ålesund during this period in a staggered

manner under 11 different projects affiliated to the thrust areas. We are also planning a visit of the ocean-atmosphere mooring experts from India to conduct reconnaissance survey of the fjord and hold discussions with their counterparts from NPI.

NERC ARCTIC RESEARCH STATION (UK) PROJECTS SPRING AND SUMMER 2013

Characterisation of the bi-directional reflectance of snow surfaces for the intercalibration and validation of satellite remote sensing products

Chris Ball PhD Research Student, Royal Holloway, University of London
(PI: Dr Martin D. King Supervisor), RIs 6269

The primary aim of the proposed research is the characterization of the spectral bi-directional reflectance of snow surfaces at a potentially new calibration site of interest for calibration/validation of satellite remote sensing platforms. The reflectivity of snow surfaces depends on the illumination angle (solar zenith and azimuth angle) and observing angle of the satellite. The Gonio Radiometric Spectrometer System (GRASS) system will be used to measure the spatial quasi-simultaneous, multi-angle, multi-spectral measurements of snow surfaces on either Lovenbreen or Broggerbreen glacier, or on snow-covered tundra, depending on accessibility and snow cover at the time of the fieldwork.

Our specific objectives are:
1) Accurate determination of the albedo and the spectral bidirectional reflectance distribution function (BRDF) of Arctic snow surfaces at Ny-Alesund. Surfaces include the tundra surrounding Ny-Alesund and the
accumulation zone of nearby glaciers. Previous work with GRASS has been on cold Antartica snowpacks. The warmer heavily metamorphosed snowpacks of Ny-Alesund should have significantly different reflectivity
properties.
2) Synchronized ground-based measurements of the reflectivity of the Arctic snow surface with the overpass of a polar orbiting satellite to assess the accuracy of the satellite-derived measurement of surface albedo. MODIS aboard Terra and Aqua satellites and AVHRR aboard NOAA polar orbiting satellites are currently used to retrieve information on the Earth's energy budget. Ground based measurements of bi-directional reflectance are required for the calibration and validation of these remote sensing platforms.
3) Spectral measurement of the light absorbing impurities in snowpack will be recorded as the reflectivity of snow is very sensitive to light absorbing impurities in the ice at the ppb concentration. We will filter the melted snow samples for black carbon/humic/ash and quantify the black carbon/humic/ash content by using an integrating sandwich spectrometer (previously field tested in Arctic Svalbard in Oscar II land and Terra Nova Bay this summer). Previous work in Barrow Alaska (FSF grant 555.0608) demonstrated that humic-like material was more important in controlling the albedo of snow than black carbon in the blue and UV regions of the spectrum. A potential link between ice morphology and/or chemical

content with BDRF will be investigated. Such a link is expected, as it exists between nadir reflectance measurements and the ice morphology and chemical content.
4) The BRDF dataset will be reduced and presented in a useful format for the remote sensing community in conjunction with the NPL. The data set will be made available to space agencies such as ESA and NASA and international organizations such as CEOS-WGCV, which are committed to the inter-calibration of space sensors. The BRDF (HDRF) data set obtained will be related to snow surface morphology, crystal size, and ash, black carbon and humic content. The NPL supervisor of C.Ball is the chair of the Infrared Visible and Optical Sensors (IVOS) sub-group of the international Committee on Earth Observation Satellites (CEOS) and represents our pathway to impact.
5) Two Peer reviewed publications and a major portion of a PhD thesis are also objectives of this work.

Proposed Fieldwork

The project objectives will be met by a series of experiments involving the collection of field radiometric data with a goniometric system capable of near-simultaneous multi-angular and hyper-spectral measurements in the visible and near infrared. The measurement system belonging to the NERC-FSF will be used. Multi-angular field radiometric measurements of snow surfaces will be undertaken using the Gonio Radiometric Spectrometer System (GRASS) on an undisturbed glacial surface (Lovenbreen or Broggerbreen glacier), or on snow covered tundra depending on accessibility from the NERC Arctic research facility and snow cover at the time of the fieldwork. The fieldwork will be carried out during a 3-week field campaign in March/April 2013. Ideally the sky conditions should be stable during measurement , and about three sites a day can be recorded with clear skies.
The GRASS system comprises of two semi-circular frames orthogonal to each other forming a hemisphere over the target snow surface, multi-angular fibre-optics will be mounted on the frames at 15° intervals on a series of 4 arms that will view the target surface with different azimuth/zenith angles. The frame has a 2m radius and is assembled from small components. The upwelling radiation from the snow surface will be measured through each optic via a multiplexer and spectrometer at wavelengths from 400–1700 nm at 1 nm resolution at each measurement site. The quotient of the measurements from the snow surface and those from a Spectralon reference panel under the same illumination conditions is calculated to give the Hemispherical Conical Reflectance Factor (HCRF) for each azimuth and zenith angle. The HCRF is taken to be equivalent to the Hemispherical Directional Reflectance Factor (HDRF) under the assumption that the bidirectional reflectance is isotropic over the solid angle sampled by the detector. The bi-directional reflectance distribution function (BRDF) can then be derived from the HDRF to assist in calibration and validation of satellite measurements of albedo. Synchronisation of the ground based measurement of albedo with those derived from sensors such as AVHRR aboard NOAA polar orbiting satellites and MODIS aboard Aqua and Terra satellites will be attempted. Although this will depend largely on the sky conditions at the time of the satellite overpass. Snow pits at each measurements site with a depth of ~ 1 m will be used to measure physical characteristics such as snow density, temperature, grain size, grain type. Grain size and grain type will be recorded according to the international classification for seasonal snow on the ground RHUL will filter the melted snow samples for black carbon/humic/ash and quantify the black carbon/humic/ash content by using an integrating sandwich spectrometer .The data from snow pits may help to explain any spatial variation in the measured HDRF between areas of different snow types or may help to identify a link between HDRF and black carbon/humic/ash content.

Aerosol-Cloud Coupling And Climate Interactions in the Arctic (ACCACIA)

PI Ian Brooks
Co Ken Carslaw, Steven Dobbie, Barbara Brooks, Gordon McFiggans, Tom Choularton, Martin Gallagher, Hugh Coe, Lucy Carpenter, Jacqui Hamilton, James Hopkins, Ian Renfrew, John King,

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RiS 6226

Summary (from grant application)

16th Mar to 6th April 2013
13th July to 5th August 2013

The climate of the Arctic is changing faster than that almost anywhere else on Earth, warming at a rate of twice the global average. This warming is accompanied by a rapid melting of the sea ice - 2007 saw a record minimum in summer ice extent, and the years since have seen the 2nd and 3rd lowest summer ice extents on record - and a thinning of the ice that remains from year to year. The strong warming in the Arctic is due to several positive feedback processes, including a sea-ice albedo feedback (warmer conditions melt ice, lowering the average reflectivity of the mixed ice/ocean surface and thus absorbing more solar radiation, leading to increased ice melt and further lowering of the albedo) and several cloud feedbacks. Over most of the globe low clouds act to cool the surface since they reflect sunlight; over the arctic the highly reflective ice surface reduces the significance of cloud reflectivity, and the absorption of infrared radiation by cloud water droplets becomes the dominant effect - this acts to trap heat below cloud, warming the surface.
Although climate models generally show a strong greenhouse warming effect in the Arctic, they also disagree with each other more in the Arctic than anywhere else, producing a wider range of possible future climate conditions. The models also tend not to be able to reproduce current Arctic climate conditions very accurately. This large uncertainty in models of the Arctic climate results primarily from poor representation of physical processes within the models, and some unique and particularly challenging conditions. The largest single source of uncertainty is the representation of clouds. The models use simple representations of cloud properties that were developed from observations in mid latitude or tropical cloud systems - very different conditions from those that exist in the Arctic.

This project will make airborne in situ measurements of cloud microphysical properties, the vertical structure of the boundary layer and aerosol properties, and the fluxes of solar and infra red radiation above, below, and within cloud. It will also measure the production rates and properties of aerosol at the surface and their variability with season and extent of sea ice cover. These measurements will be used, along with a range of numerical models of aerosol and cloud processes, and atmospheric dynamics to evaluate the interactions between sea ice extent, aerosol production and cloud properties. New and improved descriptions of these processes suitable for use within climate models will be developed, tested, and implemented within the MetOffice climate model HadGEM.

The ability of the current MetOffice models to reproduce the observed Arctic cloud and boundary layer properties will be tested, and the impact of the new parameterization schemes evaluated.

Finally we will undertake a series of climate simulations to examine how future climate will evolve, and the feedbacks between warming of the Arctic, melting of sea ice, production of aerosol, and the properties of clouds evaluated.

Field work summary as of 26/1/12.

There will be two intensive observing periods one in March 2013 and one in August 2013 (these are not fixed yet and depend on the ship availability). Ship borne measurements will be taken in the marginal ice zone close to Svalbard (the exact position will depend on ice conditions). The FAAM BAe 146 will fly during the earlier observing period and will be based in Tromso perhaps using Longyearbyen as an alternate landing site. The BAS Twin Otter with a meteorological fit (MASIN) will fly 70 hours during the two observing periods (probably 30 hours in March and 40 in August) based in Longyearbyen. The flying will be over the ship in the marginal ice zone and consist of flights in cloud and low level (down to 50') flights measuring fluxes.

The MASIN team will be 5 people (pilot, aircraft engineer, instrument engineer and two scientists).

Peptidic nitrogen cycling in the terrestrial Arctic / Implications of increased freeze-thaw cycles for Carbon fluxes in tundra soils

Anna Foster (PhD Student) University of Bangor, UK afpe29@bangor.ac.ukDr Paula Roberts (supervisor) p.roberts@bangor.ac.uk
RiS 5238
Freezing and thawing (FT) of soils occurs regularly at high altitude and latitude. Increasing temperature and snow loss will increase incidences of freezing or frosting of the upper layer of soil. Carbon accumulates in tundra soils because cold temperatures and unavailability of water keeps decomposition rates low. FT cycles are thought to increase the dissolved organic C (DOC) pool but studies into microbial abundance in FT conditions have reported conflicting effects on population structure, function and size. Low molecular weight DOC is an excellent energy source for the soil microbial community and is rapidly respired or converted into microbial biomass. The composition of the DOC pool and its impacts on soil microbiota following FT cycles remains unknown; increases may accelerate substrate degradation and atmospheric CO_2 emissions which has implications for climate change modelling and prediction.

1. characterise and quantify the DOC pool in response to FT cycling;

2. understand the mechanistic responses of FT tundra soil microbiota to components of the DOC pool

3. quantify changes in below ground microbial community structure subjected to periods of FT cycling.

The third field site is located along the coastal plain at Stuphallet. In consultation with Nick Cox we plan to establish two separate field sites to study C cycling under different freeze thaw regimes. We will undertake collection of baseline vegetation and soil data and extract soil solutions for analysis in the UK. Small samples of soil will also be taken for further analysis in the UK. Temperature probes will be inserted into field sites soils and left in place for the duration of the field work, these will be removed prior to returning to the UK.

July 2012 – Permission was granted to erect six snow fences (4m long x 1.5m high). Three fences at Kolhaugen and three fences in the Tvillingvatna/airport road triangle. The fences will be removed at the end of the experiment.

Origin of foliation in Svalbard valley glaciers

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Professor Mike Hambrey (supervisor) mjh@aber.ac.uk
11 July – 12 August 2013
RiS 6347

The proposed research topic aims to determine the origin and formation processes responsible for the development of foliation within ice masses. Field work conducted in Svalbard is part of a larger project aiming to compare longitudinal foliation observed in valley glaciers with linear features variously described as flowlines or flowstripes found in comparatively large-scale ice streams, such as in Antarctica and Greenland, whose three-dimensional form is poorly known. Following detailed study of small valley glaciers, foliation and flowlines will be compared to determine if they share common processes of formation.

Numerous structural investigations of valley glaciers have been conducted over the past 5 decades. These studies have greatly improved our understanding of ice-structure formation and evolution in small ice masses. However, despite well-developed hypotheses describing the genesis of structures such as longitudinal and axial planar foliation, a detailed study concerning the exact mechanisms of foliation formation has yet to be conducted, especially at the crystallographic scale.

Field research in Svalbard is part of a larger study attempting to accurately describe foliation formation and evolution in valley glaciers for a variety of temporal and spatial scales. Three glaciers near Ny-Ålesund will be investigated to determine how different geographical variables have an impact upon foliation formation. Using structural geological techniques to map each glacier will enable the macro-scale structural evolution to be determined. Additionally, surface ice-facies descriptions, including the different characteristics of alternating ice layers, will be recorded. Relatively small-scale study of ice fabrics throughout the foliation's evolutionary path is important so that any micro-scale changes can be documented. However, general structural mapping and crystallographic observations only adequately describe foliation characteristics at the surface the glacier. Since foliation is a 3-dimensional structure other techniques are required to scrutinise its properties in the vertical plane. Ice-coring enables samples of englacial ice to be directly observed. Crystallographic logging from ice cores allows direct observation of ice facies properties within the glacier, and will be undertaken by thin-section analysis using an automated fabric analyser in the Aberystwyth cold laboratory. Ice-coring will be supplemented by borehole optical televiewing investigations. Hot-water or steam-drilled boreholes can allow a digital optical sensor to be lowered through an ice mass. Although ice samples cannot be obtained for crystallographic study, optical televiewing enables the ice facies to be logged in the vertical plane.

Analysis of data from Svalbard glaciers will be used to produce a generic model of foliation-formation and evolution in valley glaciers. Within this model a range of spatial scales will be included, describing large-scale, whole-glacier foliation development, in addition to small-scale crystallographic evolution. Deduction of strain regimes experienced during foliation-

formation will be used to compare valley glacier foliations with large-scale flowline features found in ice streams in the polar ice sheets.

An unrelated activity is to undertake repeat photography of other glaciers in Kongsfjorden and Engelskbukta. The photographs will be matched with those taken in 1992, 1996 and 2009, and placed on our Glaciers-Online website, which is designed to maximise our continuing public outreach commitment: http://www.swisseduc.ch/glaciers/svalbard/index-en.html

Proposed Fieldwork

Focused 3-dimensional structural glaciological analysis of Midre Lovénbreen, Austre Lovénbreen and Austre Brøggerbreen will be undertaken using field-based measurements of structure dip-angle and dip orientation. Pre-fieldwork mapping of the study glaciers using remotely sensed data will be used to produce accurate 2-dimensional structural maps upon which field measurements will be based. Field measurements of structures will be collected using a compass-clinometer. Changing surface ice facies and crystallographic characteristics with relation to the formation and evolution of foliation will be documented. Characteristics such as ice-crystal size and fabric orientation in relation to foliation structures will be recorded along the length of each glacier. This, combined with remotely sensed optical feature tracking, will enable the data to be related to strain rates and lateral compression ratios. Collection of englacial ice samples for thin-section crystallographic analysis using an automated fabric analyser will allow the changing englacial crystallographic characteristics to be identified. Englacial 3-dimensional logging of structures, conducted using borehole optical televiewing equipment, will be used to supplement data collected from ice cores.

The second activity of repeat photography to demonstrate rapid recession of tidewater glaciers involves day visits by boat to Kronebreen/Kongsvegen, Conwaybreen and Kongsbreen (Ossian Sarsfjellet). We also seek to visit Comfortlessbreen to support repeat photographs from 1992 and 2009 taken before and during its recent surge; it is anticipated that this can be achieved on foot via the col at the head of Austre Brøggerbreen.

Microbial succession from ice to vegetated soils in response to glacial retreat

Alexandre Anesio, University of Bristol, UK a.m.anesio@bristol.ac.uk
18 July – 29 August 2013
RiS 6271

The main aim of this proposal is to produce a unique database of quantifiable metabolic pathways and biogeochemical processes in Arctic soils, which extend from newly exposed soils after glacial retreat to well-developed organic and vegetated soils. Sampling across this chronosequence will allow us to examine the timing of biogeochemical changes and microbial succession in Arctic terrestrial habitats during glacial retreat. We will:

1) Determine the phylogenetic and functional composition of microbial assemblages present across a representative chronosequence of recently exposed soils after glacier retreat in Svalbard (the forefield of the Mitdre Lovénbreen);

2) Develop a combined field and laboratory framework for the understanding of changes in key geochemical and mineralogical parameters in glacial forefield that lead to the development of pristine soils;

3) Understand the horizontal and vertical distribution of a number of relevant and inter-related metabolic processes within these chronosequences, including the production and oxidation of organic carbon and methane, N fixation, sulphur and phosphorus assimilation, and anoxic metabolism;

4) Determine the key microbial metabolic processes (e.g., net C metabolism, N fixation), in relation to physical and chemical characteristics (e.g., redox potential, temperature, organic chemistry), across the chronosequence;

5) Characterise the relative abundance of autotrophs and associated exopolymeric substances (EPS) in soil biofilms;

6) Investigate the relationships between phylogenetic and metabolic composition (Objectives 1 and 3) and the variations in geochemistry and key biogeochemical processes (Objectives 2, 4 and 5) associated with Arctic soil microbes.

Proposed Fieldwork

The forefield of one small valley glacier (Midtre Lovénbreen (ML), Svalbard) will be chosen for this project. There is easy site access and logistics are routinely organised and executed. The main purpose of our sampling strategy is to understand microbial succession in newly exposed forefields before the establishment of a mature and diverse plant community. ML is a polythermal glacier and its moraines are considered unstable due to subglacial outflows during the spring resulting in frequent and unpredictable reworking of moraines and thus,

resetting successional events. Therefore, we propose a sampling approach similar to Hodkinson et al (2003), who studied plant communities and soil chemistry, using a transect with least-disturbed features across the foreland. The transect will be 1 Km long spanning an age range of ~100 years. Sampling for the metagenomics, microbial community composition, activity and geochemistry/mineralogy will be conducted during the peak of the summer season in order to optimise the sampling of stable communities. We will sample from 7 stations along the transect. Two sediment depths will be sampled at each station. Surface sampling will consist of the first 3 cm of the soil layer, while the deeper layer will consist of an integrated 10 to 50 cm of the region identified by redox potential boundaries. The exact sample depth and integrated profile will depend on the colonisation stage of the soil and this will be determined in the field before sampling. Repeated measurements of redox potential and temperature in the soil will be determined prior to sample collection. We predict that depth gradients in redox potential will be different for each site.

Our sampling strategy will include one integrated sample from glacial surface and one from subglacial outflows for ML in order to investigate microbial communities that very likely provide the main microbial inoculum for Arctic soil communities in their initial phase of succession. This sampling strategy will give us a picture of the microbial genetic and physiologic diversity of the main chronosequence for each Arctic habitat. Synchronous samples for the determination of community composition, architecture, activity and geochemistry will also be collected. However, because measurements of geochemistry and community activity are easier to analyse relative to metagenomes, we will cover a larger spatial and temporal scale and investigate the potential variability in our sampling strategy, including phylogeny determination using ssu rRNA. Further, we will screen for basic microbial activity indicators directly in the field (e.g., CO_2 fluxes, ATP) and measure a number of organic and mineralogical parameters using portable instruments (fluorescence, XRF, UV-VIS and infrared, ATR-FTIR, as part of this project and the PhD studentship in Leeds). This way we will pre-examine the samples before the metagenomic sampling and this will allow us to collect representative samples of each site. Naturally, basic physico-chemical parameters line temperature, pH, and redox potential (Eh) will also be also measured along the transect using the Hypnos III datalogger and associated probes, providing automated and continuous measurements of these variables.

Are glacier surfaces the last refuge of an evolutionary ancient lineage of unknown fungi?

Dr Arwyn Edwards, University of Aberystwyth aye@aber.ac.uk

25 July – 15 August 2013

RiS 6348

The project's key objectives relate to the stated aims and objectives of the PI's NERC grant (NE/K000942/1). In brief, these relate to the characterization of the microbial biodiversity of Svalbard glacier surfaces. In particular, we seek to elucidate the phylogeny, distribution and ecological functions of a group of basal fungi discovered by the PI following prior fieldwork at NERC station in 2006&7 (described in Edwards [2009] PhD thesis, University of Wales, Aberystwyth, Edwards *et al.* [2011] *ISME J.* **5**:150-160, Edwards *et al.* [2012] *Fun. Ecol*. in press; Edwards *et al.* [2013] *Polar Research.* in press). This will necessitate sampling, environmental parameter measurement and incubations on the bare ice surface and forefield of Austre & Midtre Lovénbreen, Austre & Vestre Brøggerbreen, Pedersenbreen and Botnfjellbreen and other glaciers in the region as conditions permit.

Proposed Field

Addressing project objectives will entail sampling, measurement and experimentation on the bare ice surface and forefield of Austre & Midtre Lovénbreen, Austre & Vestre Brøggerbreen, Pedersenbreen and Botnfjellbreen and other glaciers as accessibility permits. Small samples of cryoconite, sediments, surface ice meltwater and soils will be collected (a permit from the Sysselmannen and Norwegian Mattilsynet will be sought to cover soil samples) in grid transects from the upper extent of bare ice through the forefield. Additionally, *in situ* incubations of cryoconite debris with selected antimicrobials will be conducted according to established protocols, and analysed using a standard infra-red gas analysis method. Finally, enclosed *in situ* baiting and enrichment of cryoconite fungi will be attempted using inert organic substrates (e.g. cellulose). Samples will be archived at NERC station for later DNA & RNA analysis, microscopy and flow cytometry using established protocols.

Exploring Water Routing Across Arctic Glacier Surfaces Using Novel 3D Photographic Approaches

Dr David Rippin University of York david.rippin@york.ac.uk
26 August – 9 September
RiS 5238

This overall aim of this proposal is to ***explore the understudied mechanisms by which drainage channels on a glacier's surface evolve and migrate***. This is important because such drainage controls the delivery of water to the glacier bed via crevasses and moulins (where it influences ice dynamics).

Supraglacial streams occur on glaciers where meltwater discharge is sufficiently high and where channel incision is more rapid than surface lowering by ablation (Marston, 1983). They are incised into ice by frictional melting, mechanical erosion and direct radiation, at up to several metres per summer (Ferguson, 1973; cf. Knighton, 1981). Many supraglacial rivers exhibit intense meandering, geometrically similar to alluvial streams (Leopold & Wolman, 1960; Ferguson, 1973), despite significant differences in environment (Knighton, 1972; cf. Leopold *et al*., 1964; Da Silva, 2005). However, relatively little is known about the mechanisms involved in the evolution of these channels, and as this brief review highlights, many studies of supraglacial drainage networks are more than 30 years old.

Over the course of a melt-season, the density of a glacier's supraglacial channel network varies spatially and temporally as the contributing area, surface slope and water volume varies. Similarly, as melt rates change over the longer term, and as glaciers retreat and thin, such drainage density increases are also likely to occur (Brykala, 1998; Irvine-Fynn *et al*., 2011). Such changes have implications for ice dynamics as well as for the delivery of glacier meltwater to extra-glacial locations.

Given recent advances in remote sensing and the use of unmanned aerial vehicles (UAVs), new opportunities now exist to characterise pathway evolution at hitherto unattainable spatial and temporal resolutions. As a result, our objectives can be listed as follows:

O1. To use a UAV (a 'QuestUAV 200') to fly a series of sorties across the glacier Midre Lovénbreen, collecting repeat high-resolution images of the ice surface (ideally daily), using a modified Lumix LX5 camera.

O2. To geo-reference all images (using a York-owned Trimble dGPS sytem) and therefore build a series of 3D models of the ice surface, and most significantly the network of supraglacial channels that exist on the glacier. Initially we will use 'Agisoft Photoscan' for the conversion to a 3D surface, but we anticipate that the reflectivity of the glacier's surface may mean more complex processing is required.

O3. To use our UAV sorties to also overfly off-glacier regions, so as to geo-reference static

locations, thereby improving the monitoring-accuracy of changes revealed in the margins of supraglacial drainage channels.

O4. Offline, a final objective is to characterise spatially distributed patterns of surface motion at very high resolution, from displacement of features observed in our imagery. This may involve the application of novel data analysis techniques to extract 'useful' features of the data automatically.

Proposed Fieldwork

This work will be carried out on the glacier Midre Lovénbreen. Rippin has extensive experience of this glacier, having spent 4 separate seasons working on it, primarily studying its hydrology, dynamics, and thermal regime. He therefore has good knowledge of accessing the glacier from Ny-Ålesund, and also safety-issues on the ice (although it should be pointed out that daily UAV-sorties will not require glacier-access on foot). We wish to work during the late summer when snow cover will be at a minimum, but when there is still substantial surface water on the glacier. We propose to walk from Ny-Ålesund every day to the glacier forefield, and to launch our UAV from here. We will launch from the top of the neoglacial moraine, thus reducing the transit-time from Ny-Ålesund. Our UAV is capable of covering up to 100 Ha in a single flight, and so we will easily be able to survey the entire glacier and its off-glacier margins in each sortie (the glacier covers an area of < 6 km^2).

Following each UAV survey, dGPS will be used to survey a series of markers that we will locate on the glacier, and off the margins for the duration of our fieldwork.

After completing each day of work, we will return to Ny-Ålesund to recharge batteries in our UAV and our dGPS, and will then be in a position to process our data.

NILU activities during the last six-months period

October 2012 - April 2013

Approx. 150 man days in Ny-Ålesund last year, a moderate increase from previous years.

NILU monitoring at the Zeppelin station:

Persistent organic pollutants (POP's)

PCB A total of 33 PCB's, weekly samples, (48 hours sample)
Pesticides, insecticides etc. HCB, HCH's chlordanes and DDT-group, weekly (48 hrs)
Brominated Flame Retardants PBDE, 15 comp's, HBCD, 3 isomeres
Poly aromatic hydrocarbons (PAH) ~ 40 comp's weekly (48 hrs) + Oxy Nitro PAH
Perfluorinated Alkylated Substance 6 components, once a week (48 hrs sample)

Inorganic compounds

Heavy metals, Hg (5 min), As, Cd, Co, Cr, Cu, Pb, Mn, Ni, V, Zn, 3/week (48+48+72 hrs)
Acidification HNO_3/NO_3^-, NH_4^+/NH_3, SO_2, SO_4^{2-} gases and particles, daily (24 hr sample)
Inorganic Particle Bound, Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^- daily (24 hr sample)

Greenhouse gasses

CH_4 Methane	continuously (new instrument)
CFC's, HCFC's, HFC's, PFc's	(20 compounds) semi-continuously, every 2 hour
CO Carbon Monoxide	continuously
CO_2 Carbon Dioxide	continuously
H_2 Hydrogen	semi-continuously, every 20 minutes
N_2O Nitrous oxide	every 30 minutes
Tropospheric ozone	continuously, monitor every minute

Meteorological data

Monitoring in Ny-Ålesund (Sverdrup station):

Total ozone:	Continuously UV/ VIS absorption instrument (Feb-Apr, Aug-Oct)
Stratospheric NO_2:	Continuously UV/ VIS absorption instrument (Feb-Apr, Aug-Oct)
UV – irradiation:	Continuously UV-irradiance measurements (Apr – Sep)
Particles/aerosols:	Continuously, Aerosol optical depth (AOD) (Apr – Sep).
Precipitation:	pH, conductivity, SO_4^{2-}, Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, NO_3^-, NH_4^+ (weekly avg.)

Influence of ship traffic on Ny Ålesund/Zeppelin atmospheric SO_2 and aerosol measurements

This study is now published in Atmospheric Chemistry and Physics. It has shown that ships cruising in the Arctic can already now have a substantial influence on the pollutant concentrations in pristine areas of the Arctic, at least on a local scale. If Arctic shipping in summer will increase as predicted over the next few decades (e.g., Corbett et al., 2010) the entire Arctic may be affected by ship emissions. Thus, the influence currently seen at Ny Ålesund and Zeppelin may be a harbinger of a much more pronounced Pan-Arctic ship influence in the future.

Methane: GAME at Svalbard

Measurements of methane isotopes at Zeppelin Observatory

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

The research project GAME (*GAME: Causes and effects of Global and Arctic changes in the MEthane 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 $\delta^{13}C/CH_4$. To better distinguish and describe the various sources bi-weekly samples of air for analysis of D/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.

Selected publications

Park, K.-T., Lee, K., Yoon, Y.-J., Lee, H.-W., Kim, H.-C., Lee, B.-Y., Hermansen, O., Kim, T.-W., Holmen, K. J.
Linking atmospheric dimethyl sulfide (DMS) and the Arctic Ocean spring bloom.
Geophys. Res. Lett., 40, 155-160. doi:10.1029/2012GL054560

Björkman, M.P., Kühnel, R., Partridge, D.G., Roberts, T.J., Aas, W., Mazzola, M., Viola, A., Hodson, A., Ström, J., Isaksson, E..
Nitrate dry deposition in Svalbard
Tellus B, 65, 19071, doi:10.3402/tellusb.v65i0.19071

Cole, A. S., Steffen, A., Pfaffhuber, K. A., Berg, T., Pilote, M., Poissant, L., Tordon, R., Hung, H.
Ten-year trends of atmospheric mercury in the high Arctic compared to Canadian sub-Arctic and mid-latitude sites.
Atmos. Chem. Phys., 13, 1535-1545. doi:10.5194/acp-13-1535-2013.

Quennehen, B., Schwarzenboeck, A., Matsuki, A., Burkhart, J.F., Stohl, A., Ancellet, G., Law, K.S.
Anthropogenic and forest fire pollution aerosol transported to the Arctic: observations from the POLARCAT-France spring campaign.
Atmos. Chem. Phys., 12, 6437-6454. doi:10.5194/acp-12-6437-2012.

Saikawa, E., Rigby, M., Prinn, R. G., Montzka, S. A., Miller, B. R., Kuijpers, L. J. M., Fraser, P. J. B., Vollmer, M. K., Saito, T., Yokouchi, Y., Harth, C. M., Mühle, J., Weiss, R. F., Salameh, P. K., Kim, J., Li, S., Park, S., Kim, K.-R., Young, D., O'Doherty, S., Simmonds, P. G., McCulloch, A., Krummel, P. B., Steele, L. P., Lunder, C., Hermansen, O., Maione, M., Arduini, J., Yao, B., Zhou, L. X., Wang, H. J., Elkins, J. W., Hall, B
Global and regional emission estimates for HCFC-22.
Atmos. Chem. Phys., 12, 10033-10050. doi:10.5194/acp-12-10033-2012

Krogseth, I.S., Kierkegaard, A., Mclachlan, M.S., Breivik, K., Hansen, K.M., Schlabach, M.
Occurrence and seasonality of cyclic volatile methyl siloxanes in Arctic air.

Environ. Sci. Technol., 47, 502-509. doi:10.1021/es3040208

Halse, A.K., Schlabach, M., Sweetman, A., Jones, K.C., Breivik, K.
Using passive air samplers to assess local sources versus long range atmospheric transport of POPs.
J. Environ. Monit., 14, 2580-2590. 10.1039/C2EM30378G.

Svendby, T.M., Myhre, C.L., Stebel, K., Edvardsen, K., Orsolini, Y., Dahlback, A.
Monitoring of the atmospheric ozone layer and natural ultraviolet radiation.
Annual report 2011. Kjeller, NILU (Statlig program for forurensningsovervåking. Rapport 1129/2012. TA-2952/2012) (NILU OR, 29/2012).

Ubl, S., Scheringer, M., Stohl, A., Burkhart, J.F., Hungerbuhler, K.
Primary source regions of polychlorinated biphenyls (PCBs) measured in the Arctic.
Atmos. Environ., 62, 391-399. doi:10.1016/j.atmosenv.2012.07.061

38th NySMAC
15-16 Apr 2013
Krakow, Poland

National Institute of Polar Research Activity in Ny-Ålesund

Masaki Uchida
National Institute of Polar Research

In the period from November 2012 to April 2013
13 Japanese researchers of 6 projects carried out in Ny-Ålesund,
93 man-day

1. Meteorology
   2 researchers, November 6–19, January 31- February 7
   Project name: Greenhouse gas observation at Ny-Ålesund (RIS ID: 3442)
   1 researcher, February 12-14
   Project name: An observational study on radiative and microphysical properties of mixed phase clouds in the Arctic (RIS ID: 3832)
   3 researchers, April 15-22
   Project name: Measurement of snow physical parameters using a ground-based spectral radiometer (6022)
2. Glaciology
   3 researchers, April 15-22
   Project name: Observation of recent glacier variation (6323)

3. Other business
   4 people, March 18-21 Exchange information about a new station

From May 2013 –

Biology

1 researcher, July 22- 29

Project name: Small scale vegetation monitoring in Ny-Ålesund (5973)

6 researchers, July 4-29

Project name: Response of high Arctic tundra ecosystem to climate change (3156)

Placing an automated weather station at Stupallet (observation period: 3 years)

Placing CO2 probes in soil to monitor soil CO_2 concentration and to estimate soil CO_2 efflux.

04-2013: Status report Geodetic observatory, NMA

Current Staffing:

Moritz Sieber
Geir Mathiassen
Åsmund Skjæveland
Kent Roskifte

Åsmund Skjæveland to Hønefoss 01.07.13

- Vacant position!

http://www.kartverket.no

Kartverket

Operation status

VLBI Antenna

- Earth orientation parameters (x, y, Δx, Δy, dUT1)
- Station coordinates / tectonic plate movement

Maintenance work to keep progress **.. Goal: 98% fulfilled observations (gearboxes, DBE, Remote access)**

NB! Stabilization check on fixed marks in the area around NYAL with Helicopter period 19.8-25.8.13

Gravimeter

- (relative) gravity measurements
- New SCG expected before end June!

Tide water gauge

GPS/GNSS-receiver

- reference stations NYAL & NYA1
- ionospheric scintillation monitoring

Norwegian Polar Institute – Sverdrup Station

Status report to NySMAC meeting in Krakow 15-16 April, 2013

Norwegian Polar Institute works for:

- New initiative for establishing an ocean acidification laboratory in the basement of the marine laboratory.

Radio communication in the Ny-Ålesund area.
Repeaters are used to strengthen the VHF radio communication signals, and to give wider coverage. Placing repeaters on the Zeppelin observatory, gives coverage for quite large areas around Ny-Ålesund and Kongsfjorden. At the moment NPI and Sysselmann has repeaters on the Zeppelin mountain. AWIPEW, and Kings Bay also has needs for placing repeaters at the station. However space is limited, and all traffic disturbs the measurements. NPI therefore encourages all the stations in Ny-Ålesund to cooperate on radio communication to limit the number of physical antennas to be placed on the mountain. NPI also acknowledges the need for better access to radio communication in the Kongsfjorden area for safety reasons.

Opinions on the need for a common solution is welcome.

Limiting local pollution
At the NySMAC meeting in November , SU by HC Hansson presented the results from the measurements of local air pollution in Ny-Ålesund performed by SU and NILU with support from NP. The measurements were carried out from "Bua" in the center of town in the period of 2008-2010. The report shows that even in Ny-Ålesund local traffic have measurable emissions. NPI has ordered an eclectic vehicle that will arrive in Ny-Ålesund in mid-May. We do encourage other stations in Ny-Ålesund to participate in the testing to see if this can be an alternative to diesel vehicles. For our own use, we will use the eclectic vehicle to go to and from the cable car, in order to minimize disturbance of the measurements in Gruvebadet.

Geotherman energy
It is applied for funding from Svalbard Miljøfond for geothermal investigations for replacing fossil fuel with geothermal for Ny-Ålesund. There are lots of uncertainties regarding the geothermal potential and the geology in this region, however we must strive to find energy sources with low emissions for the settlement. PI in the project is Kirsti Midttømme from CMR-Norway. Other partners are the University of Tromsø, NPI and Kings Bay.

At the Zeppelin observatory
NPI has relocated its radiation measurements from the roof of the Sverdrup station to the Zeppelin station. Rebuilding the station at its current location would have, at best, resulted in a duplication of AWI's measurements. Instruments for measuring incoming long wave and shortwave (diffuse, direct and total) radiation has therefore been installed at the Zeppelin Station. Responsible scientist is Stephen Hudson.

NPI has made an agreement with KOPRI for installing a DMS-measurement instrument at the Zeppelin station.

Chinese visitor
Lee Lang from Department of Ambient Air Quality Monitoring, China National Environmental Monitoring Center was a visiting researcher at the Norwegian Polar Institute from October through November to experience how running a high quality environmental monitoring is organized and maintained in Norway.

Netherlands Arctic Station

Status report to Ny-SMAC, Krakow, 15 April 2013

Activities summer 2013

Station open from 17 June til 15 August 2013
Planned activities: 478 persondays in 60 day period (about 8 persons daily)

Activities close to town:

- Barnacle goose catching and ringing
- Raising captive goslings to study body condition and infections
- Study the effect of grazing on vegetation with fenced plots
- Wildlife camera's to observe predators
- Arctic tern catching, ringing and observing (using geolocators)

The New Netherlands Polar Program has funded 4 new projects. As a consequence, research activities will be more than in previous years. The following projects have field work planned in 2013 (titles are shortened, abstracts are in the RIS database):

- Barnacle Goose Ecology (RIS 6359)
- Optimal timing for breeding in migratory birds (RIS 6362)
- From historical data towards a prediction of geese on tundra (RIS 6361)
- Effects of heavy metal contamination on stress in barnacle geese (RIS 6331)
- Benthic indicators for the impact assessment of human activities (RIS 6281)
- Taxon specific productivity in coastal phytoplankton

Planned field work in 2014:

- Ecological consequences of 400 years resource exploitation
- Microbial viral lysis in a changing Arctic Ocean

Visit our website for more background information about our activities:

http://www.arcticstation.nl

Status report from University of Tromsø to the NySMAC meeting in Krakow April 2013

On-going projects

Project: Tromsø Geophysical Observatory
Tromsø Geophysical Observatory / The Auroral Observatory has operated a Geomagnetic Observatory in **Ny-Ålesund** since
Duration: 01-06-1966 - Institution(s): UiT

Project: Dynamics of the active methane oxidizing community in a High Arctic wetland ...
Methane oxidizing bacteria are key player in methane cycling and wetlands are a major source of methane. Methane bursts have been reported during onset of freezing from a wetland in Greenland and raise the question of the response of the methanotrophic community due to seasonal changes. Graef, Christiane Svenning, Mette Marianne Frenzel, Peter UiT **...**
Duration: 01-04-2010 - 30-12-2011 Institution(s): UiT, MPI

Project: Impact of local geochemistry on the diversity and abundance of methane ...
of these unusual organisms. Our goal here is to sample sites around **Ny-Ålesund** to test this basic hypothesis, using a sampling
Duration: 01-01-2008 - 30-12-2008 Institution(s): NCL, UiT, UiT, MPI, KU

Project: Applied physiology in extreme environments - enjoy the cold
Workshop in **Ny-Ålesund**, 2007, which stated that scientific ice diving operation procedures needs to be monitored and verified **...** along with the scientific underwater activity. **Ny-Ålesund** with its unique location and infrastructure, with a hyperbaric **...** in the arctic regions, we strongly believe that there is a need for our activity in **Ny-Ålesund**. During the course we plan to perform
Duration: 01-03-2013 - 30-04-2018 Institution(s): NPI, UiT, NTNUcam

Project: Regulation of methane by soil microbes in Arctic terrestrial ecosystems
at Spitsbergen. Our previous studies of soil ecosystems have documented the presence of these important soil microbes in **Ny-Ålesund**
Duration: 01-01-2007 - Institution(s): UiT

Project: Arctic Earth Observation and Surveillance technologies
of **Ny-Ålesund** in April/May of 2009 and 2011. In this connection measurements of summertime glacier albedo will bring **...**. This second season a combined campaign using UAS, in situ and helicopter measurements from RV Lance, UAS from **Ny-Ålesund**
Duration: 01-09-2009 - 30-08-2014 Institution(s): NPI, Norut IT, NILU, UiT, AARI, ARS

Project data collected from the RiS database. Svein Kristiansen April 14, 2013.