

Ny-Ålesund Terrestrial Ecology Flagship Workshop Report

13-16 August 2018 in Ny-Ålesund



The participants of the first terrestrial flagship meeting 13-16 Aug 2018 in Ny-Ålesund

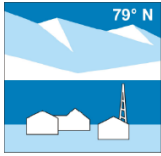
The Ny-Ålesund Terrestrial Flagship is a coordination and planning group of NySMAC, which aims to facilitate and inform all scientists studying tundra or lakes in Ny-Ålesund.

The flagship received generous support from Svalbard Science Forum to organize an on-site workshop to visit field sites and experiments in the Ny-Ålesund/Kongsfjord area.

The aim of the workshop was to increase cooperation in measurements, data use, publications, study sites and experimental manipulations. Workshop output included: Registration of locations of field sites, research questions, data availability and plans for improvement of study sites. We also made some small video recordings of the principal investigators explaining each study.

This workshop will be followed up by a second workshop in fall 2019 in Longyearbyen. The aim of the second workshop will be a scientific publication of the terrestrial ecosystem.

More information can be found on the Ny-Ålesund Terrestrial Ecology Flagship webpage:
<http://nysmac.npolar.no/research/flagships/terrestrial.html>



university of
 groningen

Meeting agenda
arrival Monday afternoon
introduction of participants
short presentations e.g. COAT
site visit long term goose exclosures Thissbukta
site visit long term reindeer exclosures Red river+Stuphallet
site visit Japanese sites Stuphallet and Storvannet
site visit CCT tower and surroundings
site visit permafrost site
site visit CLIMARCTIC
site visit glacial retreat transect
site visit lake studies
discussions
content and activities of workpackages
planning LYR meeting autumn 2019
joint terrestrial paper
return Thursday morning
Thursday evening meeting at SIOS-UNIS
Introduction to registration of research facilities (Inger)
Standardisation of data (Lara)
What will become our SIOS core data?
food and stay until late departure plane

Participants list

First name	Last name	Institution	Country
Angela	Augusti	CNR-IBAF	Italy
Ilaria	Baneschi	CNR-IGG	Italy
Elise	Biersma	British Antarctic Survey	United Kingdom
Eefje	De Goede	Cml, leiden university	The Netherlands
Josef	Elster	Centre for Polar Ecology, University of South Bohemia	Czech Republic
Santonu	Goswani	Indian Space `Research Organisation	India
Brage Bremset	Hansen	Norwegian University of Science and Technology (NTNU)	Norway
Daniel	Hitchcock	University of Oslo	Norway

Thomas Correll	Jensen	Norwegian Institute for Nature Research	Norway
Ulf	Karsten	University of Rostock, Institute of Biological Sciences	Germany
Silje Marie	Kristiansen	Department of Biosciences, University of Oslo	Norway
Yoo Kyung	Lee	KOPRI	Korea
Maarten	Loonen	University of Groningen	The Netherlands
Ashild	Pedersen	Norwegian Polar Institute	Norway
Fang	Peng	Wuhan University	China
Cecilia	Sandström	Research Council of Norway	Norway
Christian	Smit	University of Groningen	The Netherlands
Alfred	Stach	Adam Mickiewicz University, Poznań	Poland
Hans	Tømmervik	NINA Trondheim	Norway
Masaki	Uchida	National Institute of Polar Research, Japan	Japan
David	Velazquez	Universidad Autonoma de Madrid	Spain
Elie	Verleyen	Ghent University	Belgium

Summary

A vision on the future of terrestrial research in Ny-Ålesund

The Terrestrial Flagship had its first dedicated workshop from 13-16 August in Ny-Ålesund. Thanks to support of Svalbard Science Forum, 25 scientist came together, presented their research and visited the different field-sites which have been established in the last three decades. These meetings are essential to increase cooperation in a science field which contains many fragmented projects with different focus and timeline perspectives.

While comparable stations like Zackenberg or Abisko have intensive baseline monitoring programmes of the entire ecosystem as a basis for science projects, Ny-Ålesund has only long term monitoring on mammals, birds and a little bit on vegetation. Soils with biological processes in the active layer of the permafrost, biological crust formation, insect phenology and diversity and lake ecosystem structure have been studied as short term projects but monitoring should intensify as the arctic amplification of climate change is already changing the physical environment.

New developments are instrumented sites for automatic registration. Examples are permafrost measurements, temperature sensors in the top soil or in lakes, and the use of cameras (NDVI for plant biomass and phenology; automatic wildlife cameras for registration of presence of specific species and an index for grazing pressure and predator density). These measurements need to be taken to a landscape level (e.g. project COAT). Another interesting development is the reconstruction of historic ecosystem structure based on old pictures, historical records and lake sediment cores.

Pollution and digging are unfortunately relevant complications. The former coal mining area has large quantities of coal on the surface with detectable effects on vegetation and herbivores. Also traffic, maintenance work and underground infrastructure have destroyed former green areas.

Field sites visited during the workshop were gradients of glacial retreat or moisture, nutrient enriched areas like bird cliffs and locations of vegetation manipulations (exclosures to exclude grazing, snow fences, plots with additions of nitrogen, water or stable isotopes) or instrumented

monitoring (permafrost, snowmelt (via albedo measurement) or NDVI (=biomass). Most of these sites have less visible control plots. An effort was made to describe all these manipulations with proper coordinates in a SIOS / NPI / KingsBay database. For the final registration, it is important to define all plots in a designated field site and the use of a dGPS is essential for accuracy.

Over thirty years, there have been several efforts by scientists and organisations to register sites and plots into a common system. It has proven almost impossible to retrieve these old registrations. We found several old plots still marked with plastic tubes. Some of these plots were revisited as a new project of the same scientist after more than 10 years and still proved to have scientific value. Nevertheless, the information and details on the plot layout is only held by the individual researchers, which we are currently trying to disclose. The same holds for some old enclosures, which require maintenance and where in some cases ownership is unclear.

In the summer of 2018, several researchers staked out their own sites for new monitoring and added new plots. There is a clear role for coordinated action under the flagship. For a new registration system, it is essential that it will be kept alive, that it has enough details for new scientific projects and that it is user-friendly and properly maintained or supervised.

A new laboratory for terrestrial research is being built in Ny-Ålesund. This new laboratory offers new possibilities for science but also for more intense cooperation among terrestrial scientists, while working in Ny-Ålesund. At the moment, many stations have in-house facilities or laboratories for samples taken in the field to analyse or prepare for transport. An open, free-to-use, well equipped, central laboratory facility could be an important contribution for terrestrial research. Ny-Ålesund has had specific facilities for terrestrial research in the past, like a greenhouse, facilities to keep animals (arctic foxes, glaucous gulls, eider ducks), a special place to process soil samples and a below-zero working room. All of these have not been maintained by lack of projects. The new terrestrial laboratory needs proper instruments for processing samples from the field but could also benefit from new infrastructure like controlled climate cabinets to perform experiments with material collected in the field at different temperature and light conditions. The workshop participants have created a list of standard and advanced equipment to the new laboratory.

Unmanned aerial vehicles (UAV) are becoming more important in terrestrial research for mapping, and (multispectral) scanning. Ny-Ålesund has a special facility for this, which needs to become a more accessible with equipment for general use. Without this, keeping radio-silence becomes an increasing problem for new scientific developments.

The Terrestrial Flagship is working on a scientific paper to describe the highlights of former terrestrial research and the potential for future research. There is a second meeting financed by Svalbard Science Forum at the end of summer 2019 in Longyearbyen, where the paper will be finalized and the cooperation strengthened further. This meeting will also link with parties working in other parts of Svalbard and has the possibility for site visits in the vicinity of Longyearbyen.

In summary, the most important enhancements of science and cooperation in terrestrial research

- an infrastructure for site and plot registration with dGPS and printed maps
- a well-equipped terrestrial laboratory for common use
- automated monitor installations on a landscape level (e.g. instrumented sites and UAV's).
- improved responsibility for maintenance and easy access to scientific instruments and data