

Project information

Project title

Large scale impacts of herbivory on vegetation

Year

2011/2012

Project leader

Bernt Johansen and Eirik Malnes, Norut Tromsø

Participants

- Bernt Johansen, Norut Tromsø
- Eirik Malnes, Norut tromsø

Flagship

Terrestrial, Theme: Vegetation state and herbivore management

Summary of Results

This sub-project is linked to Nordic Centre of Excellence (NCoE/Tundra) funded by NordForsk, in the scheme of Top-level Research Initiative. In this project WP5 is denoted "Large scale impacts of herbivory on vegetation". One of the main goals of this work-package is to serve upon request both the NCoE/Tundra and the terrestrial part of the Fram Centre projects with maps and satellite-based products at different resolution and scales. In the NCoE/Tundra project the areas of Northern Scandinavia is selected as the main study region, while for the Fram Centre projects an enlarged geographical frame is projected with an inclusion of Svalbard, Kola Peninsula and other areas in the northern circumpolar region. In addition of producing satellite maps with different resolution and scales, the WP further aims to calibrate satellite derived products (NDVI, LAI) in order to assess important grazing (phytomass, productivity, greenness, lichen content) and climate parameters. An important topic here is the relationship between vegetation and snow.

In the first stage of the project the main focus has been to finalize a seamless vegetation map covering the western parts of the Barents region. This work is a continuation of earlier mapping in Norway, northern Sweden and Finland. The new map will cover all areas in the western parts of Barents region (Fig.1). A correspondent map is also produced for Svalbard (Fig.2). The map is produced along a fixed production line involving three operational stages (pre-classification, post-classification, standardization). At this stage the pre-classification part of the project is nearly finished. The post-classification part and the standardization will be finished in the first half of 2012. In order to evaluate the biomass, greenness and productivity of northern landscapes, the clip-harvest plot method is selected in order to obtain an accurate estimate of phytomass for the dominant vegetation communities in the region. During 2011 this activity was initiated for the mountain birch forests by conducting biomass recordings in areas of Abisko, Altevann, Dividalen, Skibotn/Kilpisjärvi and in some coastal areas of Troms. Comparable recordings were collected for the inner parts of Finnmark in 2010. Correspondent research is conducted on Nordenskjöld Land, Svalbard. The recordings in northern Scandinavia will continue in 2012 by focusing on community types in the low alpine belt of the mountain region. For the research related to the combination of snow and vegetation Norut has continued the work of producing climatological maps based on extraction of snow cover information from satellite images (MODIS/SAR). At present a work describing the seasonal variation of snow cover for all areas in Fennoscandia is under development. The map product will be related to the phytogeographical pattern of vegetation in Scandinavia. During the spring 2012 the method will be undertaken some improvements. Data from the year 2011 will be processed, combined with an updated version of the time-series study of data from the years 2000-2011. A preliminary version of this product was presented at the EARSeL LIS workshop, Bern, February 7-9, 2011. Within this activity a co-operation to researchers in Finland (FMI) and Austria (Enveo) is established.

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Published Results/Planned Publications

Publications:

- Tømmervik H, Bjerke, J.W. Gaare, E. Johansen, B., and Thannheiser, D. 2011 (in print). Rapid recovery of recently overexploited winter grazing pastures for reindeer in northern Norway, *Fungal Ecology* (2011), doi:10.1016/j.funeco.2011.08.002
- Johansen, B.E., Karlsen, S.R., and Tømmervik, H. 2011 (in print). Vegetation mapping of Svalbard utilizing Landsat TM/ETM+ data. *Polar Record*: 1-17. doi:10.1017/S0032247411000647.
- Johansen, B., Tømmervik, H, and Karlsen, S.R. 2011. Kartlegging og overvåking av reinbeiter, Finnmarksvidda. Status 2009/2010. Norut/Rapport. 45. sider.
- Tømmervik, H., Johansen, B., Karlsen, S.R & Ihlen, P.G. 2011. Overvåking av vinterbeiter i Vest-Finnmark og Karasjok 1998-2005-2010. Resultater fra feltrutene. NINA Rapport 745 65 s.
- Malnes E., J.Å. Riseth, C. Johansson and H. Tømmervik, "Satellite monitoring of Snow on reindeer pastures in Northern parts of Sweden and Norway", Oral presentation in", Proceedings to EARSeL LIS workshop, Berne, February 7-9, 2011.
- Bosiö, J., Johansson, M., Callaghan, T., Johansen, B. & Christensen, T. 20xx. Future vegetation changes in thawing subarctic mires and its implications for greenhouse gas exchange - a regional assessment. Accepted for publication in *Climate change*

Planned publications:

- Johansen, B & Karlsen, S.R. 20xx. Vegetation mapping of Northern Scandinavia utilizing Landsat TM/ETM+ data.
- Malnes, E & Karlsen, S.R. 20xx. Estimate of first and last snow free day in Northern Fennoscandia using Terra MODIS data. In prep.

Communicated Results

Reports in March 2012

Interdisciplinary Cooperation

Reports in March 2012

Budget in accordance to results

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Could results from the project be subject for any commercial utilization

No
Conclusions

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