

Title:

Advancement of the northern forest lines in northern Norway in the period 1914 - 2007

Authors & affiliations:

Tømmervik, H.¹, Hofgaard, A.², Hanssen, F.² & Rees, G.³

¹The Norwegian Institute for Nature Research, Arctic Ecology Department, The Polar Environmental Centre, N-9296 Tromsø, Norway. ²The Norwegian Institute for Nature Research, Terrestrial Department, N-7485 Trondheim, Norway. ³Scott Polar Research Institute, Cambridge University, United Kingdom.

Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

The interface between the boreal forest and the arctic tundra is the Earth's largest vegetation transition zone and climate change as well as change in land use can alter the position of this zone. In order to detect changes in the northern latitudinal forest lines of birch and pine in Finnmark county (Norway), we used old and new forest maps, topographic maps as well as remote sensing based imagery and maps. For the latter data we used both traditional spectral classification as well as "spectral unmixing" on imageries from sensors like Landsat and Quickbird for detection of the forest lines. Comparison of the birch forest lines from 1914 and 2007 revealed a north-ward advancement of up to 11 km in the western part of the study area (Western Finnmark County), an advancement of 22 km in the middle parts of Finnmark to 12 km in the eastern part of Finnmark. The advancement for the period 1980 to 2007 was less than 1 km in northern direction for most of the area. The analysis revealed only minor changes in the position of the pine forests for most of the study area and the period 1914-2007. On the contrary, the advancement of the pine forest in eastern part of Finnmark has been up to 4-5 km. The changes in the position of the northernmost birch forest line are considered to be a combined effect of reduced grazing (reindeer, goats and sheep) and climate change. The recorded slower forest cover change rate seen for pine is, hypothetically, both related to differences in species-specific response patterns and due to extensive exploitation of the pine forests during World War II and the following decades.

Important notes:

Do **NOT** write outside the grey boxes. Any text or images outside the boxes **will** be deleted.

Do **NOT** alter the structure of this form. Simply enter your information into the boxes. The form will be automatically processed – if you alter its structure your submission will not be processed correctly.

