

**Title:**

**Contrasting Climate- and Landuse-Driven Tree Encroachment Pattern of Sub-Arctic Tundra in Northern Norway and Kola Peninsula**

**Authors & affiliations:**

*Sigrun Aune<sup>1,2</sup>, Annika Hofgaard<sup>3</sup>, and Lars Söderström<sup>1</sup>*

*1) Norwegian University of Science and Technology, NO-7491 Trondheim, Norway.*

*2) Present address: Norwegian Institute for Agricultural and Environmental Research, NO-8860 Tjøtta, Norway.*

*3) Norwegian Institute for Nature Research, NO-7485 Trondheim, Norway*

**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.)

High latitude regions are experiencing substantial climate change and the forest-tundra transition is assumed to sensitively track these changes through advancing treeline and increased tundra encroachment. However, herbivores may influence these responses. Present study address how mountain birch treelines and sapling cohorts beyond the treeline has responded to last decade's climate warming in six areas across North European sub-arctic regions with different climate and grazing characters. The results show deviating response patterns, representing advancing-, stationary-, and possibly retreating treelines, among regions. Recruitment was abundant over last decades in all areas except one, with predominantly arctic conditions, where both tree- and sapling cohorts were old. Areas with high annual precipitation show advancing birch populations characterized by young individuals and partly overlapping tree- and sapling age distributions. Areas in reindeer summer-herding districts show stationary or retreating birch populations characterized by non-overlapping age distributions, and sapling survival constraints. Recruitment pattern beyond the treeline generally corresponded with non-growing season climate variables, with emphasis on precipitation, indicating importance of a protecting snow cover throughout the winter. The results highlight the important interplay between abiotic and biotic control over tundra encroachment and treeline dynamics, and the importance of multi-site studies when addressing forest-tundra ecotone responses to global warming.

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