



How to preserve the tundra in a warming climate?

Jukka Käyhkö and the NCoE Tundra Team
Finland (jukkay@utu.fi)

The warming climate of the polar regions may change much of the current arctic-alpine tundra to forest or dense scrubland. This modification requires adaptation by traditional livelihoods such as reindeer herding, which relies on diverse, seasonal pasturelands. Vegetation change may also trigger positive warming feedbacks, where more abundant forest-scrub vegetation will decrease the global albedo. NCoE Tundra team investigates the complex climate-animal-plant interaction of the tundra ecosystem and aim to unravel the capability of herbivorous mammals to control the expansion of woody vegetation. Our interdisciplinary approach involves several work packages, whose results will be summarised in the presentation. In the ecological WPs, we study the dynamics of the natural food chains involving small herbivorous and the impacts of reindeer on the vegetation and the population dynamics of those arctic-alpine plants, which are most likely to become threatened in a warmer climate. Our study demonstrates the potential of a relatively sparse reindeer stocks (2-5 heads per km²) together with natural populations of arvicoline rodents to prevent the expansion of erect woody plants at the arctic-alpine timberline. In the climatic WPs we study the impact of grazing-dependent vegetation differences on the fraction of solar energy converted to heat. In the socio-economic WPs, we study the conditions for maintaining the economic and cultural viability of reindeer herding while managing the land use so that the arctic-alpine biota would be preserved.