Geophysical Research Abstracts
Vol. 14, EGU2012-12138, 2012
EGU General Assembly 2012

Land cover change impacts and vegetation-climate feedbacks with focus on Eurasia

M. Weiß and B. van den Hurk
KNMI, De Bilt, Netherlands (weiss@knmi.nl)

In recent studies of climate change impact on the biosphere, the transition zone of Nordic tundra to boreal forests has emerged as one of the hotspots, because global warming could promote a northward advance of the tree line. Associated changes in albedo, in return, would lead to additional warming, so that theses areas should exhibit a strong feedback on the climate. With the global climate model EC-Earth, the impact of land cover characteristics and land cover type conversion on the atmosphere is analysed, hereby focusing on available energy, evapotranspiration, and temperature. We try to de-tangle and quantify the different feedback-pathways, i.e. albedo-feedbacks, that could lead to warming due to darker vegetation and trees covering snow, a larger fraction of latent heat flux at the expense of sensible heat, i.e. more evapotranspiration and interception in forested areas, and a higher surface roughness, which might lead to lower surface temperatures. The direction of change, therefore, merits careful analysis, as effects of opposing signs do occur, which cannot be neglected in climate change simulations and analysis.