

Biodiversity and Climate Change: Consequences for Norway Spruce Mountain Forests in Slovakia

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Abstract : Study of the effects of climate change on Norway Spruce (*Picea abies*) forests has mainly focused on the diversity of tree species diversity of tree species as a result of the ability of species to tolerate temperature and moisture changes as well as some effects of disturbance regime changes. The tree species's diversity changes in spruce forests due to climate change have been analyzed via gap model. Forest gap model is a dynamic model for calculation basic characteristics of individual forest trees. Input ecological data for model calculations have been taken from the permanent research plots located in primeval forests in mountainous regions in Slovakia. The results of regional scenarios of the climatic change for the territory of Slovakia have been used, from which the values are according to the CGCM3.1 (global) model, KNMI and MPI (regional) models. Model results for conditions of the climate change scenarios suggest a shift of the upper forest limit to the region of the present subalpine zone, in supramontane zone. N. spruce representation will decrease at the expense of beech and precious broadleaved species (*Acer* sp., *Sorbus* sp., *Fraxinus* sp.). The most significant tree species diversity changes have been identified for the upper tree line and current belt of dwarf pine (*Pinus mugo*) occurrence. The results have been also discussed in relation to most important disturbances (wind storms, snow and ice storms) and phenological changes which consequences are little known. Special discussion is focused on biomass production changes in relation to carbon storage diversity in different carbon pools.

Keywords : biodiversity, climate change, Norway spruce forests, gap model

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