Projected changes of Köppen-Geiger climate types in Central Europe

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We present an analysis of the future distribution of Köppen-Geiger climate classification (KGC) types and estimate a potential impact of their shift on the population and major land-use types in Central Europe. The projection of the 21st century climate conditions is based on the high resolution (10 km) bias corrected simulations of two regional climate models, ALADIN-Climate and RegCM3, following the IPCC SRES A1B emission scenario. Forests and non-irrigated arable land represents approximately 70% of the total study area covering the territories of Czech Republic, Slovakia and northern Austria. Temperate oceanic climate (Cfb) will become the most dominant KGC type of the region toward the end of the century. However, it will shift into higher altitudes and substitute a rich variety of colder climate types that exist there nowadays. Boreal climate types (Dfb, Dfc) will practically vanish in the region, but its lowlands will be hit by the large scale expansion of the humid subtropical climate (Cfa) that may affect up to 18% of the forests area and more than half of the arable land. Majority of broad-leaved forests will experience conditions that could be considered as typical for the Cfa or Mediterranean (Csa) climate with the probability of occurrence higher than 10%. Similarly a half of the mixed forests and significant part of coniferous forests will be exposed to Cfa- or Csa-like years at least once in 10 years.