Assessment by the use of the Köppen-Trewartha classification of climate change in Europe throughout the 21st century from an ensemble of regional climate models.

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Through the use of the climatic classification of Köppen-Trewartha (K-T), the ability to reproduce the current climate of Europe has been shown for a system composed of 15 regional climate models (RCMs) nested in 6 global climate models (GCMs). Simulations of current climate (1971-2000) agreed between 55.4% and 81.3% with the observations on the allocation of climate types. In this respect, the result of the ensemble of the 15 RCMs is better than that of any individual model, with an agreement of 83.5% with observations. K-T has also been used to analyze the projected climate change over the 21st century under the SRES-A1B emissions scenario. It was found that 22.3% of the gridpoints in the domain change their climate by the period 2021-2050 compared to current climate and 48.1% change by 2061-2090. The shifts of climate that affect the biggest extensions are projected in Central Europe and Fennoscandia, but other smaller areas suffer more intense changes which potentially are more dangerous to vegetation and ecosystems. Generally, these changes occur at a sustained rate throughout the century, reaching speeds of up to 90000 km2 per decade in the retreat or expansion of some climates.