



European climate change at global mean temperature increases of 1.5 and 2°C above pre-industrial conditions as simulated by the EURO-CORDEX regional climate models

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In this study we present results from a large ensemble consisting of more than 30 EURO-CORDEX high-resolution regional climate model (RCM) simulations at 12.5 km horizontal resolution covering Europe. The ensemble consists of a range of RCMs that have been used for downscaling different GCMs. We present changes in a number of impact-relevant indices. The results indicate considerable near-surface warming already at 1.5°C global warming exceeding that of the global mean in most parts of Europe. Changes are becoming increasingly more pronounced and more robust within the ensemble at 2°C and at higher levels of global warming. The changes in many climate indices are shown to be modulated by changes in mean sea level pressure indicating a strong relationship with the large-scale circulation and its internal variability as given by the choice of global climate model and ensemble member. For some other indices, however, we find stronger dependency on the choice of regional climate model indicating that local and regional processes have a strong impact on the simulated climate change. By comparing to a larger ensemble of CMIP5 GCMs we find that the RCMs can alter the results leading either to attenuation or amplification of the climate change signal in the underlying GCMs.