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Grid enabled regional climate simulations within the EURO-CORDEX project: ERA-interim hindcast 1990-2009

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We present results of a regional climate model simulation over Europe that has been performed within EURO-CORDEX initiative (COordinated Regional climate Downscaling Experiment). The mesoscale meteorological model WRF-v3.3.1 (Weather Research & Forecasting Model) has been applied as a regional climate model to perform a 20-year long hindcast simulation (1990-2009) driven by the ERA-interim reanalysis. The boundary data are provided on a 6 hourly basis in a 0.75o resolution. The modelling domain covers Europe with a resolution of 0.44o. The schemes selected for the climate simulation are i) WRF-single moment 6 class (microphysics) ii) CAM (SW/LW radiation) iii) MM5 similarity (surface layer) iv) NOAH (land surface) v) Yonsei University (planetary boundary layer) vi) Kain-Fritsch (cumulus). One year (1989) was used a spin up time. Output variables are provided as 3-hourly averages with the exception of daily minimum and maximum 2m-temperatures which are calculated based on internal time-step values. The model has 30 vertical layers extended up to 50 hPa. Model results are compared to the E-OBS (v7.0) observational dataset for key climatic variables, namely 2m temperature (mean, minimum, maximum) precipitation and sea level pressure. First results indicate that the WRF climate model captures well the spatial seasonal patterns of the mean 2m temperature. The winter (DJF) bias is mostly negative over the whole European domain reaching up to -3oC over north-western Europe. The mean temperature bias is lower during summer months (JJA) (< 1oC) slightly underestimating in northern Europe and overestimating in central-eastern Europe. WRF seems to overestimate seasonal precipitation for both seasons but mostly during the warm months, almost over the whole European domain with few exceptions. The mean seasonal bias ranges between -2 to 2 mm/day. The basic spatial patterns of precipitation over Europe are captured by the WRF model compared to the EOBS dataset. The EGI (European Grid Infrastructure) and Hellas-Grid infrastructures have provided the necessary computational resources for the realization of the regional climate model simulations.