High resolution regional climate simulation with the CLM

C. Meissner, G. Schädler, C. Kottmeier

Institut für Meteorologie und Klimaforschung Karlsruhe, Forschungszentrum Karlsruhe / Universität Karlsruhe (catherine.meissner@imk.fzk.de)

We use the climate version of the Local Model (CLM) provided by the German Weather Service (DWD) to perform high resolution regional climate simulations. The physics and dynamics of the CLM are the same as in the operationally used weather prediction model LM (Doms et al. 2005, Doms and Schättler 2002). The only differences are changes to simulate longer timescales, e.g. the seasonal variation of the external parameters like plant cover and leaf area index (Böhm et al. 2006).

We will present a sensitivity study and an ensemble simulation for the period from 1990 to 2000 for the area of South West Germany. The simulation area (450 x 450 km) is an orographically structured region (including the Black Forest and the Rhine Valley) where a large part of the precipitation is caused by convection.

In the sensitivity study we changed the grid size (14 km, 7 km and 2.8 km) and the driving data (ERA40 and NCEP) to assess the influence on the convective precipitation and other near surface parameters. For the ensemble simulation we switched between different physical schemes and parameterisations available in the CLM like the different cloud physics schemes and surface transfer schemes.

In the presentation we discuss the influence of grid size and driving data on the convective precipitation and on the annual and monthly means of near surface parameters like 2m-temperature, wind speed and evaporation. The simulations are compared with measurements in order to identify a suitable model configuration for high resolution regional simulations with the CLM in that region. For that configuration we will discuss the results of the ensemble simulation.

References

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