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Analysis of ENSEMBLES multimodel simulations forced by ERA40

I. Anders, B. Rockel

Institute for Coastal Research, GKSS Research Center, Geesthacht, Germany
(Ivonne.Anders@gkss.de)

Within the ENSEMBLES project several participating European institutions run their regional climate models (RCM) for the same European domain (including the Mediterranean and Island) with the same grid size of 0.44° and in a second simulation 0.22°. The simulations use ERA40 reanalysis as forcing data and cover at least the time period from 1961 to 2000. All partners have to provide output data according to a pre-defined list. With help of such ensemble simulations of the period covered by ERA40 it is possible to detect and attribute regional climate change and to assess regional model performance on inter annual and shorter time scales over several decades. At GKSS the regional model runs are performed with CLM, Climate version of LM (Lokal-Modell) the weather forecast model of the German Weather Service (DWD). Beside the conventional forcing at the lateral boundaries the spectral nudging technique is used.

For 2m temperature the CLM model output has been compared to the gridded dataset of the Climate Research Unit (CRU) with a spatial resolution of 0.5° and the reanalysis dataset ERA40 with a spatial resolution of 1.125°. The model results for total precipitation have been compared to the precipitation dataset of CRU (0.5°) and the Global Precipitation Centre Project dataset (GPCP) with a spatial resolution of 2.5°. CLM performed 2m temperature with differences of +/-4K compared to the datasets of CRU and ERA40. These differences have a strong annual cycle. For the subregions Iberian Peninsula, British Islands, France, Central Europe and Mediterranean CLM performs lower values during winter and higher values during summer period. For the subregion of East-Europe the values during summer are very high. Differences between ERA40 data and CRU data especially in the Scandinavian Region and East-Europe have been detected. Compared to the precipitation datasets of CRU and GPCP

the CLM is able to perform the patterns and the range of values very good. The annual cycle is reproduced realistically. CLM generally performs slightly lower precipitation than CRU and GPCP during the whole year. Further analysis will investigate performance of all participating models with special focus on wind direction and wind speed within the simulation area.