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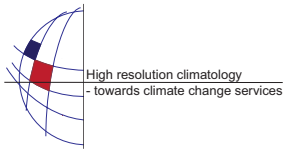

The range of regional climate change projections in central Europe: How to deal with the spread of climate model results?

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The regional climate change projections for central Europe in the 21st century show a large spread of simulated temperature and precipitation trends due to natural variability and modelling uncertainties. The questions are how to extract robust climate change signals and how to transfer the range of possible temperature and precipitation trends to climate change impact studies and adaptation strategies?

Within the BMBF funded research priority „KLIMZUG – Managing Climate Change in the Regions of the Future“, innovative strategies for adaptation to climate change are developed. The funding activity particularly stresses the regional aspect since the global problem climate change must be tackled by measures at regional and local level. The focus of the joint project “KLIMZUG-NORD – Strategic Approaches to Climate Change Adaptation in the Hamburg Metropolitan Region” is to establish an interdisciplinary network between the research, administrative and economic sectors in this region.

The regional climate change information is provided by the Max-Planck-Institute for Meteorology as input for climate change impact assessments. The cross-sectional task "climate change" is to prepare consistent regional climate data and to advise on its reasonable use. The project benefits from the results of the ENSEMBLES EU project, in which an extensive set of regional climate change simulations at 50 km horizontal resolution were performed for 1950 to 2100. For impact studies, higher horizontal resolutions are required. With the regional climate model REMO, three global climate change scenarios from ECHAM5-MPIOM were downscaled to 50 km with three ensemble members each. In a second step, some members were further downscaled to 10 km for central Europe. For the global and regional simulations, the trends were analysed and indicate a strong internal climate variability, which further increases the range of climate change simulation results. This all recommends the application of 1. several RCMs to consider the uncertainty of downscaling methods, 2. different ensemble members of a certain climate change scenario to consider internal climate variability, 3. different global climate change scenarios to consider the influence of greenhouse gas emissions. The spread of climate change information needs to be transported into impact assessments in order to develop flexible adaptation strategies.