High resolution climatology
- towards climate change services

Intercomparison of statistical techniques for postprocessing the RCM-generated data

J. Miksovsky (1), P. Skalak (2), and P. Stepanek (2)

(1) Dept. of Meteorology, Charles University, Prague, Czech Republic (jiri.miksovsky@mff.cuni.cz), (2) Czech Hydrometeorological Institute, Prague, Czech Republic

Despite the increasing resolution of the climate simulations and advances in the development of the parameterizations used, the GCM and RCM outputs still suffer from substantial systematic errors, even for the most basic climate characteristics such as temperature or precipitation. These problems can complicate application of the simulated data for subsequent analyses aimed at assessing the impact of climate change. It is therefore beneficial (and sometimes necessary) to postprocess the model outputs with statistical techniques removing or reducing the most serious discrepancies.

In this contribution, various postprocessing strategies are explored and applied to the RCM outputs: Simple approaches based on shifting and/or rescaling the data, transformations utilizing simple nonlinear mappings, as well as several techniques completely restructuring the statistical distribution of the target variable. The performance of the postprocessing techniques is tested for selected regional climate models, recently run in the frame of the projects CECILIA and ENSEMBLES. The calibration and validation dataset consists of measurements of daily precipitation and temperature from the region of Central Europe. Special emphasis is put on achieving a realistic reproduction of extreme values and also on assessing the changes of the projected future temperature and precipitation induced by the postprocessing. It is shown that in order to obtain a realistic representation of the statistical distributions including their extreme tails, simple corrective techniques often do not suffice, and even the more sophisticated methods do not always guarantee optimal results.