



Evaluation of precipitation in ENSEMBLES RCMs over complex orography

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We evaluated monthly statistics of precipitation in an ensemble of 14 regional climate models (RCMs) from the ENSEMBLES project, on spatial resolution 25 km, forced by boundary conditions from the ERA40 reanalysis data for the period 1961-2000. The evaluation was performed for greater Slovenian area, where despite of its modest spatial extent, three types of climate meet and interweave: Alpine, Mediterranean and Continental. Moreover, complex orography significantly influences local climate features. RCMs have been evaluated according to their capability to reproduce realistic spatial and temporal precipitation patterns. For evaluation, the high-resolution gridded observational data E-OBS was used. For each season, ensemble spread for simulated precipitation variability has been calculated and compared to observed precipitation variability. The spatial pattern of simulated precipitation variability spread shows significant differences between seasons. Moreover, ensemble spread in some areas is higher than observed precipitation variability. These are mainly areas, where also the highest spread in orographic gradient (used in different RCMs) can be found. In addition, simulations of large scale and convective precipitation were grouped according to similarity of used orographic gradient. Significant differences among model simulations were identified inside these groups in all seasons. Given the same boundary conditions in all RCMs, this indicates that large differences exist in model physics that govern subgrid-scale processes. This was apparent especially in summer, when precipitation due to local convection is prominent.