



Dynamical downscaling of the ERA-40 reanalysis and ARPEGE GCM with the WRF regional climate model in complex terrain in Norway - comparison with ENSEMBLES

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We present a supplement to the recently finished EU-project ENSEMBLES project employing the WRF regional climate model (www.wrf-model.org). Results are presented from a dynamical downscaling of the ERA-40 reanalysis to 30 km and 10 km resolution as well as the ARPEGE global model simulations in Europe for the 30-year period from 1961 to 1990. In addition some preliminary results from a WRF downscaling of the ARPEGE R1b future prediction (2020-2050) will be shown. A relatively weak spectral nudging is used in all experiments.

The model evaluation focuses on complex terrain in Norway. The results are evaluated against daily mean observations of precipitation, 2-meter temperature and 10-meter wind speed for the 30-year period. We find that the WRF downscaling of the ERA-40 reanalysis is reproducing the distributions of the observed daily mean parameters reasonably well. Also the frequency of wet days as well as the occurrence of extreme events are improved in the downscaled data set. A significant improvement of the extreme events as well as the distributions is found when the horizontal resolution is further refined from 30 km to 10 km. The spectral nudging procedure is not found to suppress the extreme events but to significantly improve the phase of precipitation. Model intercomparison with some of the regional model runs of the ENSEMBLES project reveals that the WRF downscaling ranks high within the individual models. The ENSEMBLES mean is producing the best results in most cases.