



Downscaling and evaluation – a multi-scale observational challenge

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Climate projections with global circulation models—because of their coarse-grid resolution—do not allow regional examinations of the water balance or local estimation of extreme precipitation trends. Therefore, downscaling of the global simulations to the regional scale is necessary. Downscaling combines global-scale information from projections with regional/local-scale information from historical observations and from “constant” processes like orography and land-cover. For the training of the downscaling methods this information is necessary to be available for long time periods in high temporal resolution at the global, regional, and local scales. Additionally, empirical/statistical and dynamical/deterministic downscaling models need global-input, observational, and time-invariant information for evaluation. Both tasks, the training and the evaluation, are multi-scale challenges. This paper discusses the usability of a cascade of models/methods in the projection of precipitation extremes, the complex cross-scale interactions, and the superimposed restrictions by availability of observational data.