Title: Systematic differences between dynamical and statistical downscaling methods in the CORDEX EUR-11/ReKliEs-De Ensemble

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Abstract: The latest generation of climate projections for the 21st century is built on new emission scenarios based on Representative Concentration Pathways (RCPs). Within the world wide coordinated effort of the Coupled Model Intercomparison Project Phase 5 (CMIP5), their impact on climate is simulated with global models of the climate system. A sample of the global simulations is dynamically downscaled for Europe in the framework of EURO-CORDEX. Further simulations, based on both dynamical and statistical methods, with focus on Germany and the river catchments draining into Germany, are conducted within the framework of the project ReKliEs-De (Regional Climate Projection Ensemble for Germany) to account for the full range of model variability. Here we present an analysis of systematic differences between the results of both downscaling techniques compared to observations and a comparison of the projected climate change signals of both approaches. Due to the method, statistical downscaling techniques show smaller biases compared to observations. The climate change signals for near surface temperature cover almost the same range for both methods and depend strongly on the global model which delivers the boundary conditions. However, for precipitation the statistical downscaling methods show a decrease for the future, while dynamical models project an increase in precipitation for the 21st century.