



Future changes in Central American temperature and precipitation in an ensemble of CORDEX regional climate model simulations

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In this study we investigate possible changes in temperature and precipitation on a regional scale over Central America from 1951 to 2100. We use data from two ensembles of climate simulations, one global and one regional, over the Central America CORDEX domain. The global ensemble includes ten coupled atmosphere ocean general circulation models (AOGCMs) from the CMIP5 project with horizontal resolution varying from about 1° to 3°, namely CanESM2, CSIRO-Mk3, CNRM-CM5, HadGEM2-ES, NorESM1-M, EC-EARTH, MIROC5, GFDL-ESM2M, MPI-ESM-LR and NorESM1-M. In the regional ensemble all 10 AOGCMs are downscaled at the Rosby Centre (SMHI) by a regional climate model – RCA4 at 0.44° resolution under the RCP8.5 forcing scenario and five of ten under the RCP26 one. The experimental setup allows us to illustrate how uncertainties in future climate change are related to forcing scenario and to forcing AOGCM at different time periods. Further, taking both global and regional ensembles and focusing on seasonal mean temperature and precipitation over Central America we i) evaluate ability of the ensembles and their individual members to simulate the observed climatology in Central America, ii) analyse similarities and contradictions in future climate projections between two ensembles and iii) assess how both ensembles capture the spread of the grand CMIP5 ensemble. We also address higher-order variability by showing results for changes in temperature extremes and for changes in intensity and frequency of extreme precipitation.