



Future changes in the West African Monsoon: A COSMO-CLM and RCA4 multimodel ensemble study

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In this multi-model multi-ensemble study, we intercompare results from two regional climate simulation ensembles to see how well they reproduce the known main features of the West African Monsoon (WAM). Each ensemble was created under the ongoing CORDEX-Africa activities by using the regional climate models (RCA4 and COSMO-CLM) to downscale four coupled atmosphere ocean general circulation models (AOGCMs), namely, CNRM-CM5, HadGEM2-ES, EC-EARTH, and MPI-ESM-LR. Spatial resolution of the driving AOGCMs varies from about 1° to 3° while all regional simulations are at the same 0.44° resolution.

Future climate projections from the RCP8.5 scenario are analyzed and inter-compared for both ensembles in order to assess deviations and uncertainties. The main focus in our analysis is on the projected WAM rainy season statistics. We look at projected changes in onset and cessation, total precipitation and temperature toward the end of the century (2071-2100) for different time scales spanning seasonal climatologies, annual cycles and interannual variability, and a number of spatial scales covering the Sahel, the Gulf of Guinea and the entire West Africa. Differences in the ensemble projections are linked to the parameterizations employed in both regional models and the influence of this is discussed.