Projections of tropical cyclones in the CORDEX-CAM (Central America, Caribbean and Mexico) domain under climate change using RegCM4.7

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Under the CORDEX initiative, simulations were performed using the latest version of the ICTP Regional Climate model (RegCM4.7) at a spatial resolution of 25 km over Central America/Mexico. These simulations cover the 130-year period, 1970-2099, for two representative concentration pathways, the 2.6 (RCP2.6) and 8.5 (RCP8.5) emission scenarios. They were driven by three General Circulation Models (GCMs: HadGEM2-ES, MPI-ESM-MR and GFDL-ESM2M) from phase 5 of the Coupled Model Inter-comparison Project (CMIP5). For validation, RegCM4.7 is driven by lateral boundary conditions from the ECMWF ERA-Interim global reanalysis (RegCM4.7-ERAI) for 1980–2014. In all these simulations, the potential changes in tropical cyclone (TC) activity for the North Atlantic and the Northeast Pacific basins are investigated, using an algorithm to identify and track the TCs. The RegCM4.7 simulations driven by GCMs are evaluated for the period of 1971–2005, in comparison with the RegCM4.7-ERAI and the observed TC data from the International Best Track Archive for Climate Stewardship (IBTrACS). Preliminary results show that RegCM4.7 simulations driven by GCMs are capable of capturing the TC distribution but show a notable underestimation of very intense TCs. The analysis of the influence of global warming on the TC activity will compare the 30-year period of 2070–2099 under the two representative concentration pathways to the period of 1976–2005.