



East African climate dynamics over the past millennium in PMIP3/CMIP5 simulations

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Most of the East African's agriculture depends on the amount and the seasonal occurrence of rainfall. This, with other factors such as rapid changes in land use associated to population growth, makes this region very sensitive to climate change. However, there is no consensus on the future climate change of this region, the drivers responsible for the East African precipitation variability being poorly understood. General circulation models (GCMs) generally predict a wetter climate over that region in the context of the global warming, but these projections contrast with the recent severe droughts that have impacted East Africa. The objective of this study is to improve the understanding of the mechanisms driving the variability of the East African climate at inter-annual to decadal time scales using the experiments performed in the framework of the PMIP3/CMIP5 projects. In a first step, the performance of the different GCMs is estimated through the comparison of their mean state and the trends in precipitation and temperature over the last decades with different reanalyses. The variability of these climate variables are then studied for both the recent decades and the last Millennium using EOF analyses. This allows putting forward different patterns of variability depending on the frequency studied. Finally, the mechanisms responsible for the simulated variability are analysed by examining the dynamical links between the East African climate and, among others, the forcings as well as the sea surface temperature of the Indian and Pacific Oceans.