



Evolution of the West African Monsoon at medium-term time horizon.

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This paper is based on the analysis of 12 ocean-atmosphere coupled models of the third Coupled Model Intercomparison Project (CMIP3) used for the AR4 (fourth assessment report) of the Intergovernmental Panel on Climate Change (IPCC). Two time-period are used, the 'current' period from 1960 to 1999 with the 20c3m integration and the 'future' period between 2031 and 2070 under the A1B emission scenario. These two time-periods allow us to document the climate change in the Sahelian region at medium-term time horizon. The study, based on a multi-model approach shows a deficit (excess) of rainfall in the northern Senegal and in Mauritania (Mali and Niger). The rainfall increasing in the centre of the Sahel is accompanied by a deeper penetration of the monsoon onto the continent. The main reason for this evolution is an intensification of temperatures gradients between the Sahara and the Gulf of Guinea due to a greater warming of North Africa than the rest of the continent and of the Atlantic Ocean. A stronger monsoon system leads to an intensification of winds from the ocean (Alizes) and the Mediterranean sea (Harmattan) and thus of moisture flux convergence over the Sahel. The 'one model one vote' approach shows that a majority of models converge to a consensus, a monsoon system accompanied by an increasing (decreasing) of rainfall over the centre (west) Sahel. This presentation show the preliminary results of our study in the rainfall pattern change and its causes.