Geophysical Research Abstracts,
Vol. 11, EGU2009-6275, 2009
EGU General Assembly 2009

European models reliability over West Africa: from seasonal forecasting to climate scenarios

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The severe drought that stroke the Sahel during the 1970's and the 1980's had dramatic consequences regarding to impacts in terms of food security and health. Improving the prediction of the West African Monsoon (WAM) system and its impacts on health, water resources and food security became a priority at all time scales, namely from seasonal forecasting to longer climate change perspectives. However, the actual state of the art General Circulation Model (GCM) mainly fail in reproducing key features of the WAM when a full ocean-atmosphere coupled approach is considered. This leads to strong uncertainties in simulated future rainfall changes over Africa at the end of the 21^{st} century. This work proposes to highlight the differences and similarities of the GCM biases in both forecasting (seasonal to decadal) and climatic approaches. This is carried out using seasonal and decadal forecasting outputs from the ENSEMBLES project and climate historical runs from the CMIP3 dataset, used within the IPCC fourth report assessment. Preliminary results highlight consistent warm biases over the Gulf of Guinea, weak predictability of rainfall over the Sahel and problems in reproducing precipitation / orography feedbacks. The major biases highlighted in forecasting mode are generally similar to the ones depicted in climate simulations. This leads to the intermediate conclusion that the GCM biases are mainly related to their intrinsic parameterization whatever the approach considered.