



Impact of the Sahel drought on the water balance in LSMs

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Between 1970 and 1990, the Sahel has undergone its most severe drought of the century. This drought had a strong impact on the availability of water on the ground. The question raised by this study is whether current Land Surface Models are able to reproduce the impact of the drought in terms of soil wetness and river discharge changes.

Indeed, as very few observations are available over West Africa, it is difficult first to evaluate the quality of the forcing datasets used for LSMs, and then to analyze their outputs. Here, we focus on the discharge of the largest basins in West Africa (Niger, Senegal...), and on the water balance on the ground. We use river discharge observations available for the period 1950-2000 and results from Hapex-Sahel to evaluate the performance of the LSMs. This allows us to test the sensitivity of the LSM ORCHIDEE to the different inputs and mainly the precipitation.

The role of the representation of root/soil moisture profiles interactions is analyzed with the LSM ORCHIDEE, based on the comparison of the results with its different soil moisture parameterizations. We then evaluate the spread between different models within the project GSWP2.