Sensitivity of the hydrological model DHSVM to rainfall forcing: application to the Ouémé catchment in Benin

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Abstract

In West Africa an increasing number of flood events has been reported during the last twenty years while the dry conditions that have started in the 1970's still prevail nowadays. A major challenge is to understand the role of rainfall space-time variability on the generation of floods in catchment of regional extension ($> 10\ 000$ km^2). At this scale the main issue is the lack of high resolution rainfall products, typically kilometric spatial resolution at subdaily time steps, while operational networks only provide scattered daily to 10-day rain gage measurements. In this context, satellite remote sensing of precipitation is promising as it can provide valuable information on the occurrence, the spatial extension and, through inversion algorithms, the intensity of the rainy systems. The overall objective of this study is to assess the relevance of satellite products over the well documented Ouémé catchment (10000 km^2) located in Benin West Africa. The Distributed Hydrology and Soil Vegetation Model (DHSVM) is used to model the Ouémé catchment over the period 2005-2008. Preliminary results are presented documenting the sensitivity of simulated discharge to forcing rain fields: (i) the impact of two types of recording rain gage interpolation methods (nearest neighbour and lagrangian kriging interpolation), (ii) the impact of rainfall space-time resolution.

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