



## **A distributed parsimonious event-based model for Mediterranean floods: efficiency of the model and spatial variability of the parameters in Real Collobrier catchments**

Son Nguyen and Christophe Bouvier

HydroSciences Montpellier (Univ. Montpellier, CNRS, IRD), France (nguyenquocson1510@gmail.com)

Event-based models are often used for flood prediction, because they require fewer data compared to other more complex models and account for few parameters. However, this type of model needs to be initialized from an external variable which describes the soil moisture condition at the beginning of the event. Here we present the performance of such model in simulating Mediterranean floods. The distributed event-based parsimonious Soil Conservation Service Lag-and-Route (SCS-LR) model was applied in the Real Collobrier catchment, which contains a very high density of rain gauges, 17 over 70 km<sup>2</sup>. The model was calibrated from 34 flood events from 1968 to 2006 for Pont-de-Fer, the biggest sub-catchment. The initial condition of the model was highly correlated with the base flow ( $R^2=0.85$ ) and with the soil water content  $w_2$  predicted by the SAFRAN-ISBA-MODCOU (SIM) model ( $R^2=0.77$ ). The predictive score of the model, i.e. the median Nash-Suttcliffe efficiency value when using the predicted initial condition, was 0.91 when using the initial condition predicted by the base flow, and 0.80 when using the initial condition predicted by  $w_2$ . The model was also applied in other sub-catchments in Real Collobrier to study the spatial variability of the model's parameters. The variability of the most varied parameter S (maximum water retention) was in agreement to the calculated runoff coefficients. The variability of the routing parameter could be due to the role of sub-surface flows. We also proposed the hypothesis for homogenizing routing parameter.