



Flash flood warning at ungauged locations using radar rainfall and antecedent soil moisture estimations

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A method to estimate antecedent soil moisture conditions is proposed to improve the accuracy of flash flood forecasts at ungauged locations. The method combines two indexes: a ‘climatic’ temporal index calculated in each cell using an uncalibrated soil moisture accounting (SMA) scheme and a spatial ‘statistical’ index giving the “average saturation state” usually encountered before a flood. The proposed method was carried out on two different models: an event-based distributed model, and a regression model. Simulation results were analysed for 562 individual events, issued from 160 catchments located in the South of France. The presented method improved the efficiency of both models. This indicates that the both proposed indexes give relevant information for estimating antecedent soil moisture conditions at ungauged locations. Furthermore, a contingency statistical analysis based on different discharge thresholds (2-years, 10-years and 50-years return periods) showed that alerts were better forecasted by the distributed model. These encouraging results suggest that further efforts should be made for the development of the method and its operational application.