

## **Estimation of hydrological response of a small Mediterranean watershed to fire by data analysis and a modelling approach**

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**Abstract** Data analysis and a modelling approach were used to detect the changes in hydrological regime in the Rimbaud watershed (France) after the fire in 1990. It was revealed that the increase of peak discharges was only observed during three years after the fire in the wet period of the year, at an hourly time scale. The Hydrograph model was applied for continuous runoff simulations at an hourly time step for the period 1967–2004. The parameters assessed for pre-fire conditions and used without change for the post-fire period satisfactorily fit the whole period of simulations with mean Nash-Sutcliffe efficiency 0.52. The set of model parameters representing the post-fire conditions of changing environment was developed. Based on newly estimated parameters, the efficiency of simulations of selected outstanding flood peaks was improved. However, overall model representation for the post-fire period (1990–1992) has declined. It is concluded that discernible fire impact is only localized on separate floods events and that it has a nonlinear character.

**Key words** flood; modelling; fire; non-stationary; Hydrograph model