



Scaling the flood regime with the soil hydraulic properties of the catchment

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The spatial land cover distribution and soil type affect the hydraulic properties of soils, facilitating or retarding the infiltration rate and the response of a catchment during flooding events. This research analyzes: 1) the effect of land cover use in different time periods as a source of annual maximum flood records nonstationarity; 2) the scalability of the relationship between soil hydraulic properties of the catchment (initial abstractions, upper soil capillary storage and vertical and horizontal hydraulic conductivity) and the flood regime. The study was conducted in Combeima River basin in Colombia - South America and it was modelled the changes in the land uses registered in 1991, 2000, 2002 and 2007, using distributed hydrological modelling and nonparametric tests. The results showed that changes in land use affect hydraulic properties of soil and it has influence on the magnitude of flood peaks. What is a new finding is that this behavior is scalable with the soil hydraulic properties of the catchment flood moments have a simple scaling behavior and the peaks flow increases with higher values of capillary soil storage, whereas higher values, the peaks decreased. Finally it was applied Generalized Extreme Values and it was found scalable behavior in the parameters of the probability distribution function. The results allowed us to find a relationship between soil hydraulic properties and the behavior of flood regime in the basin studied.