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Dry events time series for optimization of management rules dams in semi-arid Tunisia

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This contribution focuses on an analysis by event of dry event, according to a predetermined threshold, from series of observations of the daily rainfall. The accent has been put on the modeling. The approach has been illustrated on a case study of the Ghézala dam Northern Tunisia where the average rainfall is 680 mm. The dry events are constituted of a series of dry days framed by the rainfall event. Rainfall events are defined themselves in the form a uninterrupted series of rainfall days understanding at least a day having received a precipitation superior or equal to a threshold of 4 mm. The rainfall events are defined by depth and duration, which are found to be correlated. An analysis of the depth per event conditioned on the event duration has been undertaken. The negative binomial distribution appears the best overall fit for the depth per event. The duration of the rainfall event follows a geometric distribution while that the dry event follows the negative binomial distribution. The length of the climatically cycle adjusts to the Incomplete Gamma. A simulation procedure by the Monte Carlo method has been executed to generate a synthetic sequence of rainfall events and dry with correspondent lengths of rainy season.

Key words: event-based analysis, dry period, time series, generation of synthetic events.