

Meteorological drought severity explained by climate in Northern Tunisia

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Abstract Climate variability and climate change in the longer term consequences of economic, social and environmental. It is likely that climate change increases the frequency and duration of droughts. 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 approach has been illustrated on a case study catchment localized in Northern Tunisia where the average rainfall is about 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. Event based analysis was used to study of the effects of climate change on water resources and crops and to calibrate precipitation models with little rainfall records.

Key words: dry event, rainfall event, precipitation threshold, climate vulnerability.