Paper (7)

Development of design storm hyetographs in hyper-arid and aridregions: case study of Sultanate of Oman

Arabian Journal of Geoscience (2017) 10: 456

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ABSTRACT
The temporal distribution of the design storm is animportant input in hydrological models. This research aims todevelop design storm profiles representative of arid andhyper-arid areas based on actual storm recordings. Two hundredthirty-six rainfall storms were collected from seventeenrainfall gauges that cover the coastal zone of Oman for theperiod from 1993 to 2007. Storms were classified into fourcategories according to their total durations. Design stormhyetographs were derived from raw rainfall records for all fourcategories using the Alternating Block Method (ABM) andwere also computed by ABM applied on the Intensity-Duration-Frequency (IDF) curves. Both design storm profileswere compared and it was found that the ABM_IDF stormprofiles were equivalent to the four ABM_Storms profilesfrom a practical point of view as they produce similar peakdischarges. The storm profiles developed in the current researchwere also compared to the commonly used SoilConservation Service (SCS) dimensionless distributions andthe UK50 storm profiles. The results showed that the mostconservative commonly used SCS type II and the UK50 summerprofiles are not safe to be used in design purposes in aridand hyper arid regions, despite their wide utilization in manycodes of practice in these regions. The study recommendsusing the newly developed dimensionless storm profiles derivedfrom the actual records.