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Assessment of streamflow drought severity using ephemeral stream flow data

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ABSTRACT

Drought duration and severity of the past events occurred in the Sonar and Bearma sub-basins are analyzed, and the availability of flow in these ephemeral streams during normal and lean years estimated. Streamflow drought severity is defined as the accumulated volume of deficit flows. The probabilities of occurrence of zero and non-zero flows and joint probabilities of nonzero flows are estimated to derive flow duration curves. Monthly truncation levels were obtained at 75 percentile for describing wet and drought periods. To this end, 15 years and 24 years monthly streamflow data of Sonar and Bearma Rivers, respectively, were used. The study reveals that the hydrological droughts in these basins (a) usually begin during AugustOctober and (b) either terminates during the period between September and December or, if not, they continue till the onset of the next monsoon. Drought events starting during early monsoon months are found to be more severe than those starting during the late or post monsoon months, The variable truncation approach is efficacious in depicting both the drought and wet events and, therefore, in describing the drought duration and severity. Key Words: Streamflow, truncation level, drought severity, drought duration, low flow