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Spatial and temporal characterization of droughts in Central America – evaluation of five drought indices

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Central America has a large variability of climate in space and time and it is constantly affected by extreme events with sometimes severe negative consequences to livelihoods, economy and environment. In particular, droughts have large impacts on agriculture and hydropower, but studies characterizing their extent and connection to the regional climatic variability remain scarce.

We evaluated the applicability of five drought indices in Central America by analyzing their capability to characterize the spatial and temporal variability of droughts. The indices included in this study were the Standardized Precipitation Index, Standardized Precipitation Evapotranspiration Index, Effective Drought Index, Percent Normal and Deciles. Observational data are often scarce and uncertain in this region; we therefore used several different data sets based on gauged and/or satellite precipitation and temperature data. The drought indices were calculated using the TRMM, CRN073, CIGEFI-UGR, ERA-INTERIM FCLIM and CRU data sets, all having different spatial and temporal resolutions. The use of the various data sets allowed at the same time an examination of their capability to represent the complex climate of the region.