



Return period maps of dry spells for Catalonia (NE Spain) based on the Weibull distribution and L-moments

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A statistical analysis of the dry spell lengths obtained from a network of 75 rain gauges in Catalonia (NE Spain) has permitted a detailed description of their spatial distribution. The results are derived from a daily database, covering the 1950-2000 recording period, and a dry spell is defined as a set of consecutive days with daily amounts below rainfall thresholds of 0.1, 1.0, 5.0 and 10.0 mm/day. The empirical distribution of dry spell lengths is well performed by the Weibull model, whatever the rain gauge and threshold. The parameters of this distribution, estimated by L-moments, and the L-skewness-kurtosis diagrams permit to quantify the goodness of fit between empirical distribution and the Weibull model. The strong spatial variability of the daily pluviometric regime in Catalonia is depicted by the spatial patterns of dry spell lengths with return periods of 2, 5, 10, 25 and 50 years. The results indicate where drought phenomena might be more severe and how often they occur. They represent an outstanding contribution to design agriculture policies and water resources management, and also to prevent hazards concerning drought phenomena with the aim of smoothing their effects.