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Monthly shortage trends for Central and Western Europe

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Monthly shortage time trends are analysed for Central and Western Europe by considering more than 100 rain records (European Climate Assessment, ECA, and the Spanish Agencia Estatal de Meteorología, AEMET) covering the whole 20th century. Spells of monthly shortage are defined as consecutive months with amounts lowering the corresponding monthly median. Three annual variables are analysed: the average,<S>, the largest, SM, and the cumulative, CS, monthly shortage. Due to the quite irregular annual evolution of these three variables, the Kendall-tau algorithm instead of a simple linear regression of the series has been applied to evaluate time trends. Positive and negative trends, never exceeding $\pm$4.0 mm/decade, have been obtained for the three variables within the area delimited by 10ºW–25ºE longitude and 35ºN–65ºN latitude. The statistical significance at 95% level of local time trends has been assessed with the Mann-Kendall test. Additionally, the field significance of time trends is assessed by Monte Carlo simulations, randomly reproducing magnitudes and signs of time trends. The low number of empirical significant trends induces lack of field significance. A relatively high number of significant local trends (25) is only detected for CS, 6 of them are positive and 19 negative. Given that local significant trends are scattered throughout Central and Western Europe, a single spatial pattern for the monthly shortage should be discarded. Nevertheless, a close revision of local trends (statistically significant or not) manifests that positive values (increasing monthly shortage) are observed in France, a great part of the Iberian Peninsula, Central Europe and Italy.