



Projected changes in the link between the deficit of moisture transport from major moisture sources and drought occurrence in the Mediterranean region

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It is well-known that the Mediterranean region is a hotspot area in which meteorological droughts concerns, as climate models point to an increase in drought severity there. Here our aim is to study the projected changes in the influence of moisture transport deficits on drought occurrence. The contribution to the precipitation from the major moisture sources of the Mediterranean region is considered, i.e., from the North Atlantic Ocean and the Mediterranean Sea moisture sources. Statistical methods from the copula theory enabled us to estimate the conditional probability of drought occurrence given a contribution deficit from those sources, for the historical (1985-2014), mid-century (2036-2065) and end-century (2071-2100) periods. For this purpose, we make use of simulations based on dynamic downscaling by the high-resolution Eulerian mesoscale model Weather Research and Forecast (WRF) of the ERA5 reanalysis and the climate model Community Earth System Model Version 2 CESM2 model under the SSP5-8.5 scenario. We obtain that the pattern of the dominant moisture source, i.e., the one whose contribution deficit maximises drought probability, will remain relatively stable in the future. Moreover, our results point to a general increase in the conditional probabilities of drought occurrence given contribution deficits from the dominant source, for the mid-century and end-century periods, with respect to the historical one.