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Evaporation enhancement drives the European water-budget deficit during multi-year droughts

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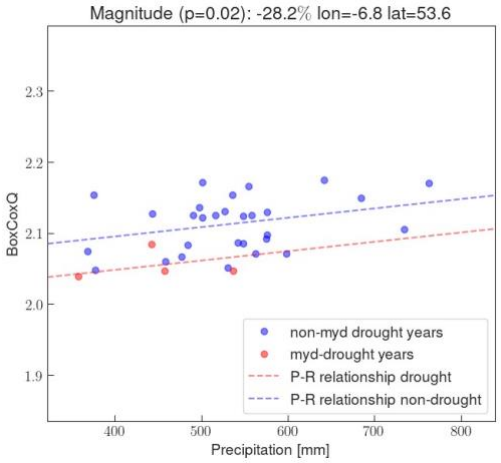
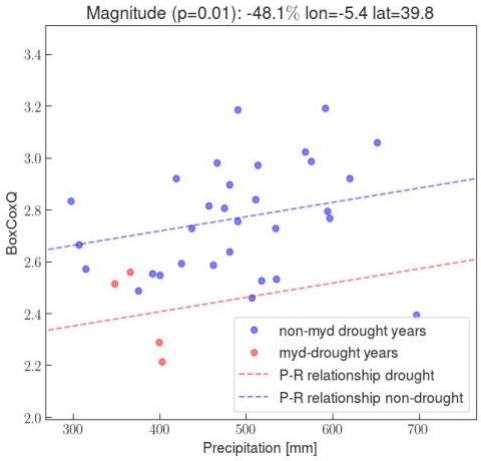


(a)



(b)

Figure S1. a) Precipitation-runoff (transformed via Box Cox) relationship for a basin located in northern Europe (a) and in Southern Europe (b). The blue and the red dashed lines refer to the results of the regression analysis of the equation 1 by leaving the possibility of the equation to shift (i.e., the red line) and no shift (blue line) during multi-year drought. For the points falling within the red line which do not belong to the multi-year drought

period selected it is possible that the mechanism of shifting is the same. Here, however, we focused only to this long period of precipitation deficit as they are more relevant from a scientific and water resource management perspective.

10

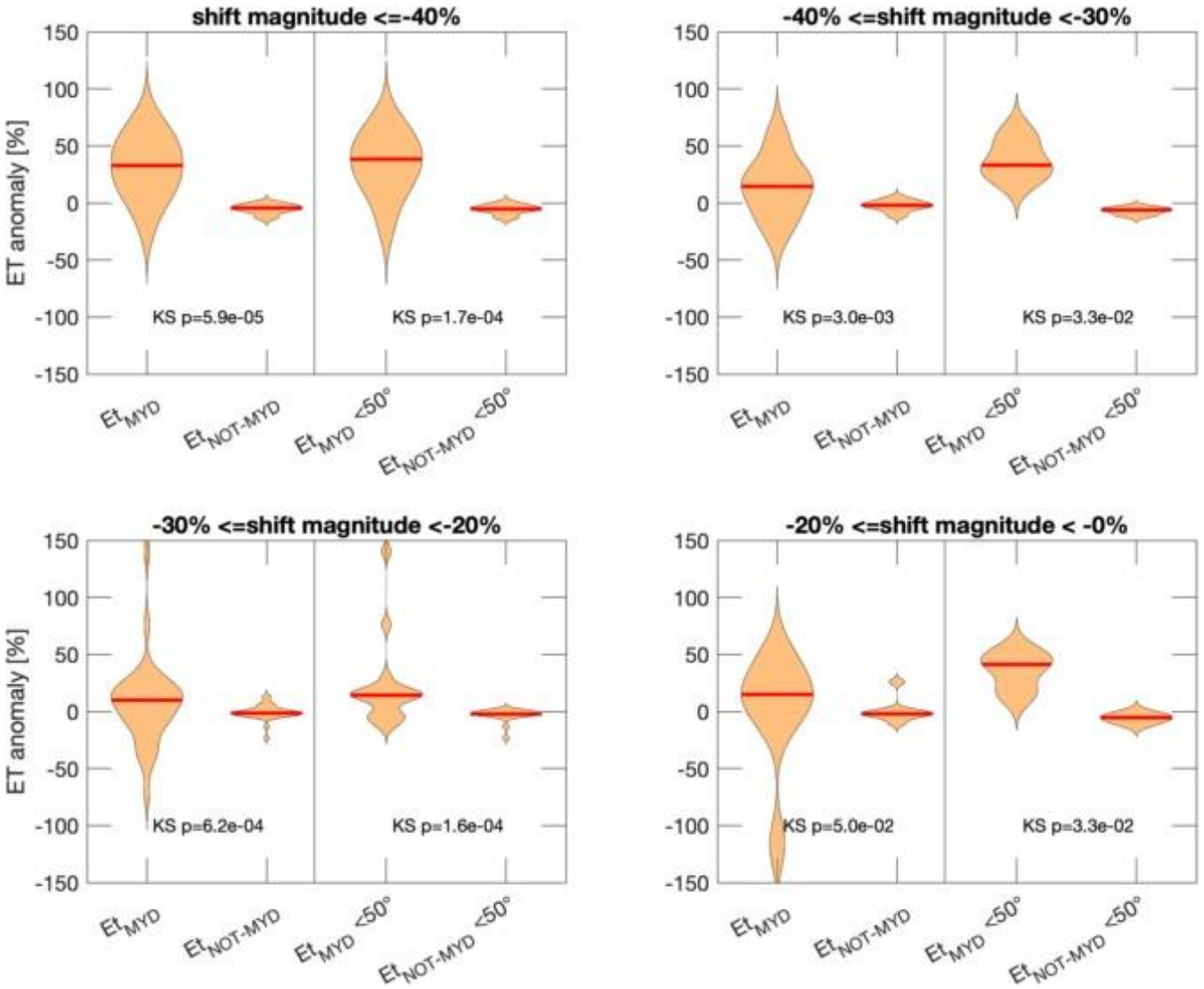


Figure S2. ERA5 evaporation anomalies for multi-year drought period (ET_{MYD}) versus non-multi-year drought periods ($ET_{NOT-MYD}$) for all statistically significant (p-value<0.05) shifting basins and for the same basins but below 50-degree latitude stratified by the shift magnitude. KS refer to the two- sample Kolmogorov-Smirnov test between the distribution of evaporation anomaly of ET_{MYD} and $ET_{NOT-MYD}$. The red line in the violin plots refers to the median value.