



The severe drought of 2016-2017 in Western Europe

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During 2016-2017, most of Western Europe has suffered a major drought. Associated impacts have been reported for a number of socio-economic sectors. Crops have been severely affected with the resulting reduction in agricultural production, especially for cereals, olives and almonds in Spain and Italy. Devastating fires in southern Europe have led to the evacuation of thousands of people and even human fatalities in Portugal. The energy sector has also been significantly impacted partly due to the drop in hydroelectrical production, which reached a ~50% decrease in Spain and coincided with minimum wind energy production, rising the electricity bill to historical maxima.

The standardised precipitation-evapotranspiration index (SPEI) is used to diagnose this major drought. It is compared to the standardized precipitation index (SPI) in order to highlight the contribution of meteorological variables other than precipitation.

The results of the SPEI show that July 2016 - June 2017 has been the most severe 12-month drought of the reanalysis period over Western Europe. Unlike most mega-droughts in Europe, the event is characterized by an unusual spatial pattern, with dry conditions over northern and southern Europe. In fact, several countries such as France, Spain or Germany have experienced a record-breaking drought simultaneously. Nevertheless, the analysis of the SPI, which only accounts for the precipitation deficit, suggests that this has not been the driest event on record. Given the discrepancies between the results found for both drought indices, we focus on analysing individually the variables controlling evapotranspiration to understand their relative roles. Moreover, the atmospheric circulation and moisture sources have been explored during the driest months in order to assess the role of synoptic patterns in the spatio-temporal evolution of the drought.