

The Unusual wet summer of 2014 in Southern Europe

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Southern Europe (Italy and the surrounding countries) experienced an unusual wet summer during 2014. The monthly total rainfall in July 2014 was 84% higher (about three standard deviation) than normal with respect to the 1982-2013 July climatology. This caused heavy damages to agriculture, tourism and overall economy of the region. In this study, we tried to understand the mechanisms for such abnormal weather using various datasets. The anomalously high precipitation over Italy is related to the sea surface temperature (SST) anomalies in the tropical Pacific through the atmospheric teleconnections. Rossby wave activity flux analysis of the upper-level circulation shows an anomalous tropospheric quasi-stationary Rossby wave from the Pacific reaching to southern Europe and maintaining there an anomalous cyclonic circulation. This anomalous cyclonic circulation is barotropic in nature so it extends to lower atmospheric levels, weakening the seasonal high and causing heavy precipitation over the Southern Europe.

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