



Intraannual variability of the Western Mediterranean Oscillation (WeMO) and occurrence of extreme torrential rainfall in Catalonia (NE Iberia)

Joan-Albert Lopez-Bustins (1), Javier Martin-Vide (1), Laia Arbiol-Roca (1), and Marc Prohom (2)

(1) Climatology Group, Department of Geography, University of Barcelona (UB), Catalonia, Spain, (2) Meteorological Service of Catalonia, Barcelona, Spain

In previous studies, the use of the Western Mediterranean Oscillation index (WeMOi) at daily resolution has proven to constitute an effective tool for analysing the occurrence of episodes of torrential rainfall over eastern Spain. In the present study, we selected the extreme torrential episodes (≥ 200 mm in 24 hours) that had taken place over the coastal provinces of Catalonia (Girona, Barcelona and Tarragona) (NE Spain) during the 1950-2013 study period (64 years). We computed daily WeMOi values and constructed WeMOi calendars based upon the mean values obtained for 10-day periods. We considered a threshold of WeMOi < -2 to detect an extreme negative WeMO phase at daily resolution. Our principal results show an occurrence of 36 episodes, mainly concentrated in autumn months. Most of the 36 episodes in the study area occurred on days presenting an extreme negative WeMOi value. Specifically, the most negative WeMOi values are detected in autumn, during the second 10-day period of October (from the 11th to the 20th of October), coinciding with a torrential rainfall maximum. On comparing the sub-periods (1950-1981 and 1982-2013), we observed a decrease in WeMOi values in the month of November, as well as an increase in these extreme torrential episodes. This might indicate a lengthening of the seasonality of the torrential rainfall period up to the end of autumn.