



Drought impacts on vegetation dynamics in the Mediterranean based on remote sensing and multi-scale drought indices

Ricardo Trigo (1), Celia M. Gouveia (1), Santiago Beguería (2), and Sergio Vicente-Serrano (3)

(1) Universidade de Lisboa, Instituto Dom Luiz (IDL), Faculdade de Ciências, Lisbon, Portugal (rmtrigo@fc.ul.pt), (2) Estación Experimental de Aula Dei, CSIC, Zaragoza, Spain, (3) Instituto Pirenaico de Ecología, CSIC, Zaragoza, Spain

A number of recent studies have identified a significant increase in the frequency of drought events in the Mediterranean basin (e.g. Trigo et al., 2013, Vicente-Serrano et al., 2014). In the Mediterranean region, large drought episodes are responsible for the most negative impacts on the vegetation including significant losses of crop yield, increasing risk of forest fires (e.g. Gouveia et al., 2012) and even forest decline. The aim of the present work is to analyze in detail the impacts of drought episodes on vegetation in the Mediterranean basin behavior using NDVI data from (from GIMMS) for entire Mediterranean basin (1982-2006) and the multi-scale drought index (the Standardised Precipitation-Evapotranspiration Index (SPEI)).

Correlation maps between fields of monthly NDVI and SPEI for at different time scales (1-24 months) were computed in order to identify the regions and seasons most affected by droughts. Affected vegetation presents high spatial and seasonal variability, with a maximum in summer and a minimum in winter. During February 50% of the affected pixels corresponded to a time scale of 6 months, while in November the most frequent time scale corresponded to 3 months, representing more than 40% of the affected region. Around 20% of grid points corresponded to the longer time scales (18 and 24 months), persisting fairly constant along the year. In all seasons the wetter clusters present higher NDVI values which indicates that aridity holds a key role to explain the spatial differences in the NDVI values along the year. Despite the localization of these clusters in areas with higher values of monthly water balance, the strongest control of drought on vegetation activity are observed for the drier classes located over regions with smaller absolute values of water balance.

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