



## **Droughts monitoring in Portugal using satellite data**

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The Iberian Peninsula is recurrently affected by drought episodes and therefore by the adverse effects associated that range from severe water shortages to economic losses and related social impacts. During the hydrological year of 2004/2005, Iberia was hit by one of the two worst drought episodes of the last six decades (Garcia-Herrera et al., 2007), reinforcing the need for a continuous monitoring of vegetation stress and for reliable estimates of the drought impacts. The strong dependence of vegetation dynamics on water availability has been for long recognized in the Mediterranean and other semi-arid regions. Reduced vegetation cover are usually related to a lack of precipitation during a considerably long period, but may be amplified by other climatic anomalies, such as high temperature, high wind, and low relative humidity. Therefore detecting drought onsets and ends and assessing their severity using satellite-derived information is becoming the standard procedure in studies related to desertification and climate change. The aim of the present work is to assess and monitor the cumulative impact over time of drought conditions on vegetation cover over Portugal. For this purpose we have used the regional fields of the Normalized Difference Vegetation Index (NDVI) as obtained from the VEGETATION-SPOT5 instrument, from 1999 to 2006. The entire period was analysed, but particular attention was devoted to the two extreme drought episodes of 1999 and 2005. We show that negative anomalies of NDVI spread over Portugal for almost all the vegetative cycle. However, it was in the southern sector of Portugal (Alentejo) that a large contiguous area presented 9 consecutive months of negative anomalies for both the 1999 and 2005 drought episodes. The vegetation response to water stress was also analysed and compared for different land cover types. Results reveal a stronger vulnerability to drought events for arable

land while deciduous forest is considerably less affected. In conclusion, and from an operational point of view, our results reveal the ability of the developed methodology to monitor vegetation stress and droughts in Portugal.

Garcia-Herrera R., Paredes D., Trigo, R.M., Trigo, I.F. Hernández H., Barriopedro D., Mendes M.T. (2007) "The outstanding 2004-2005 drought in the Iberian Peninsula: associated atmospheric circulation", *Journal of Hydrometeorology*, 8, 483-498.