



Mediterranean oak savanna vegetation response to water stress at regional and local scales

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Water availability is the primary factor controlling the distribution, growing seasons and production of the two functional vegetation types composing Mediterranean oak savannas, an ecosystem known as dehesa in Spain. Scattered oak trees (mostly *Quercus ilex* L. and *Quercus suber* L. in the Iberian Peninsula) and annual grasslands shape the landscape of this agroforestry system, considered an example of extensive farming; as it combines rural development with high ecological values and services. This vegetation endures the frequent droughts of the Mediterranean, semi-arid climate. Despite their adaptation to water stress, grasslands and trees suffer different distresses due to drought, such as the reduction of pasture production, with a direct economic consequence on livestock; or the decline and dieback of trees, which affects the ecosystem structure, and jeopardizes the conservation of the system in the long-term.

This work analyses the response of both vegetation types to the three drought events, 2005, 2009 and 2012, affecting de dehesa area of the Iberian Peninsula in the last years. The intensity of the drought, measured by the anomalies of the ratio of ET to potential ET at monthly and annual scales, is used to explain changes in the dynamic of plant growth and production. A dataset of monthly ET values at 0.05° resolution, derived using SEBS model, 250m MODIS vegetation indices, and annual agricultural statistics of the last fourteen years, are combined to explore the response of oak savanna canopies at regional and local scales.