

# Satellite image fusion techniques applied to mapping Mediterranean woody vegetation

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## ABSTRACT

An emergence loss of biodiversity observed in the Mediterranean forests and pastures (Dehesas), as one of the main elements of global change, has provided reasons to the study of woody vegetation using a variety of techniques. In recent decades, the application of remote sensing and GIS techniques to study the current conditions of these ecological systems has allowed researchers to diagnose vegetation at both the spatial and temporal scales. The intention is to develop a deeper understanding of the environmental and climatic factors impacting these forests and pasture areas. Evaluation of the spatial and temporal changes in vegetation, based upon an analysis of satellite images or high-resolution aerial photographs, offers new opportunities to discriminate between different forest types, vegetation units, or even individuals of different species in mixed forests. Therefore, this has proven to be an important tool for the management and conservation of biodiversity. In this work, we present the development of a specific methodology for the diagnoses and detection of a keystone species of these ecosystems- the wild pear tree (*Pyrus bourgaeana*, D). Using fusion techniques of satellite multispectral imagery (*Quickbird*) and aerial photographs from different periods, and also with techniques of supervised classification (*Maximum Likelihood*), the potential of

these techniques to discriminate and map wild pear trees has been evaluated in a specific area of Sierra Morena (southern Spain). We have simultaneously been able to analyze the temporal evolution of the vegetation and land uses in our study area.