UNIVERSIDAD POLITÉCNICA DE MADRID

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MÁSTER EN INGENIERÍA DE MONTES

PROYECTO FIN DE MÁSTER

TELEDETECCIÓN DE ÁREAS QUEMADAS MEDIANTE ANÁLISIS DE SERIES TEMPORALES

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Abstract

Wildfires within Europe especially affect Mediterranean countries, where together with socio-environmental problems such as rural flight or climate change the negative impact of these increases significantly.

The study of burned areas is crucial for the understanding of this phenomenon, thus allowing the resources for prevention optimization. Remote sensing provides a reliable and economically viable alternative to traditional methods for this purpose.

In the context of this MSc final project, two change detection algorithms for burned area mapping in the Iberian Peninsula and Baleares islands have been developed (OCD and ACFCD) using MODIS data through time series analysis techniques in the period 2002-2018. In addition, an automatic validation process using official data from Catalonia and Andalusia has been designed and applied, not only to the developed models but also to the MCD64A1 product of NASA's Collection 6 for comparison purposes, which had been developed using the same sensor, although with lower spatial resolution data.

The vegetal landscape difference between both validation locations is clearly reflected in the validation results. The OCD and ACFCD algorithms obtained lower omission and commission errors than NASA’s product in Catalonia, which could be due to the spatial resolution mentioned difference.

On the other hand, in Andalusia, NASA's product omission error is substantially lower than the developed algorithms, which could be related to the temporal resolution difference in the input data and its implications in the low vegetation such as grasslands, pastures or agricultural crops burned area detection.

Overall, the evaluated models have shown to behave similarly and provide consistent results for the study area and time period. However, there is still room for improvement in any case.