



Spatial analysis of patterns and causes of fire ignition probabilities using Logistic Regression and Weights-of-Evidence based GIS modelling

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In countries where more than 95% of wildfires are caused by direct or indirect human activity, such as those in the Iberian Peninsula, ignition risk estimation must consider anthropic influences. However, the importance of human factors has been given scant regard when compared to biophysical factors (topography, vegetation and meteorology) in quantitative analyses of risk. This disregard for the primary cause of wildfires in the Iberian Peninsula is owed to the difficulties in evaluating, modelling and representing spatially the human component of both fire ignition and spread. We use logistic regression and weights-of-evidence based GIS modelling to examine the relative influence of biophysical and socio-economic variables on the spatial distribution of wildfire ignition risk for a six year time series of 508 fires in the south west of the Autonomous Community of Madrid, Spain. We find that socioeconomic variables are more important than biophysical to understand spatial wildfire ignition risk, and that models using socioeconomic data have a greater accuracy than those using biophysical data alone. Our findings suggest the importance of socioeconomic variables for the explanation and prediction of the spatial distribution of wildfire ignition risk in the study area. Socioeconomic variables need to be included in models of wildfire ignition risk in the Mediterranean and will likely be very important in wildfire prevention and planning in this region.