

Temporal and spatial structure of Fuel Moisture Content values in garrigue vegetation, South of France.

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Abstract

The fuel moisture content (FMC) has long been established as an important factor in determining both the ignition hazard and behaviour of fire. It is defined as the amount of moisture (water) that is present in a fuel. As field sampling is time-demanding and inevitably produces only point measures, more recent interest has been in the estimation of FMC values from satellite images, providing estimates of fire risk for large regions (Chuvieco et al., 2002). We present here some first results from a project aiming to produce such estimates at a fine spatial resolution for an open garrigue in SE France. This vegetation is dominated by typical Mediterranean species such as *Pinus halepensis*, *Romarinus officinalis*, *Juniperus oxycedrus*, *Quercus coccifera* and *Ulex parviflorus*. Sampling was carried out over a 5 month period starting July 2006, giving a total of 30 days of measures, and focused on these five dominant species.

Whilst these results do not cover the full period of FMC variations (Spring to late Autumn), they show the expected response of FMC values to the limited summer precipitation, corresponding to a period of maximal fire risk. The response of individual species varies, from rapid responses to both wet and dry periods (e.g. *R. officinalis*) to an apparent low or lack of sensitivity to the precipitation regime (e.g. *P. halepensis*). In order to compare the observed FMC at a similar resolution as the satellite images, we have constructed an integrated value for the 20x20-m quadrats. This value is based on the point FMC values and the proportion of coverage of each species taken from a detailed vegetation map, and is represented either as a weighted average, or as a distribution of possible FMC values. The inclusion of the proportion of coverage per species allows us to take into account the varying specific responses, and build a first basic predictive model. This preliminary work remains based on a limited sample size, and future work will focus on the collection of samples during spring 2007.

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