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Integrating Remote Sensing, Topographic Factors and Outputs from Metereological Models for Real-Time Forest Fire Danger Estimation

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In this paper, we present a model developed for the estimation of vegetation fire-susceptibility based on the integration of satellite data with vegetation types, topographic factors, and wind forecasts. In this model, each parameter is weighted according to its influence on fire behaviour. In particular, the considered static factors (topography and fuel types) are estimated separately from the dynamic parameters (state of vegetation and wind forecasts). Finally, a combined fire-susceptibility index is computed, because it is more useful for operational applications.
The developed model enables us to assess changes occurring in the fire-susceptibility as well as expected fire severity (that is a rough estimation of potential fire size). Performance and reliability of the developed method were tested by using a comparison with actual forest fires that occurred in the italian Peninsula during several fire seasons.