



## **Detection of small fire affected areas by satellite data in Tuscany Region**

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In Italy, a large percentage of the total forested area burned every year is affected by few fires of large size but, at the same time, a great number of small fires affect areas of few hectares each. Thus, an accurate operational mapping of fire affected areas by satellite needs the employment of methods able to recognize the presence of both the large burnt areas and the small or very small ones. Indeed, up to now very little attention has been paid to the recognition and analysis, over large territories, of areas of very few hectares affected by small fires. Nevertheless, the possibility to derive by satellite data a map of burnt areas at regional or national scale which includes also small burnt areas is of great importance for the choice of suitable environmental management policies. When the task of locating burnt areas must be carried out periodically on large areas of varying characteristics as the Tuscany Region (Italy), the crucial problem is that of automatically locating the presence of fire scar on the territory, reducing as much as possible the number of false alarms, that is, of pixels that are erroneously flagged as burnt area.

In this work, pre- and post-fire Landsat-ETM images have been used to characterize the ability of some spectral indices used as binary classifiers to detect small fire affected areas, in particular to discriminate between pixels corresponding to burnt and non-burnt areas in the Tuscany Region. Their efficiency was evaluated with regard to commission and omission errors as a function of the threshold value.