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Satellite-based Mapping Fuel type Patterns

R. Coluzzi, A. Lanorte, I. Didonna

Institute of Methodologies for Environmental Analysis (IMAA)- Italian National Research Council (CNR)

Abstract. In the context of fire management, fuel maps are essential information requested at many spatial and temporal scales for managing wildland fire hazard and risk and for understanding ecological relationships between wildland fire and landscape structure.

The knowledge of spatial and temporal patterns of **fuel composition** is critical for improving current fire prevention and modelling .

Fire behaves according to three interacting physical factors: fuel availability, weather, and terrain. **Fuel conditions** refer to the morphological (i.e., height, density) and physiological (i.e., moisture status) characteristics of vegetation. Because the description of fuel properties is usually very complex, fire managers have described fuel classes by grouping vegetation types with similar fire behaviour characteristics. More specifically, a **fuel type** has been defined as "an identifiable association of fuel elements of distinctive species, form, size, arrangement, and continuity that will exhibit characteristic fire behaviour under defined burning conditions (Merrill and Alexander 1987). Vegetation species are not necessarily relevant for fire management, since the same species may present completely different fire propagation rates if their fuel load, density, vertical continuity, compactness, or surface area to volume ratio characteristics, among others, change.

Remote sensing data provide valuable information for the characterization and mapping of fuel types and vegetation properties at different temporal and spatial scales including the global, regional and landscape levels. This study aims to ascertain how well remote sensing data can characterize fuel type patterns at different spatial scales

in fragmented ecosystems. For this purpose, satellite multispectral multisensors scale data such as ASTER,TM,MODIS have been processed. Fieldwork fuel type recognition, performed at the same time as remote sensing data acquisitions, were used to assess the results obtained for the considered test areas.