Geophysical Research Abstracts
Vol. 18, EGU2016-13004, 2016
EGU General Assembly 2016

Relationships between different burn, vegetation and soil ratios with Landsat spectral reflectance values in fire affected areas

Anastasia Krina (1) and Nikos Koutsias (2)

(1) Department of Environmental and Natural Resources Management, University of Patras, G. Seferi 2, GR-30100, Agrinio, Greece (akrina@upatras.gr), (2) Department of Environmental and Natural Resources Management, University of Patras, G. Seferi 2, GR-30100, Agrinio, Greece (nkoutsia@upatras.gr)

The proportion of unburned vegetation within a fire affected area can be regarded as a proxy measure of fire severity that can be estimated by means of remote sensing techniques. Yet, in order to obtain sound results, it is essential to improve our current knowledge regarding the spectral discrimination of areas that have been completely burnt from adjacent areas within a fire perimeter that still have patches of vegetation, or unburned proportion of vegetation on them. The aim of our research is to reveal the role of the vegetation or the small vegetation gaps in spectral characteristics of pixels with mixed land cover synthesis (burned, vegetation and soil) to achieve a better assessment of fire mapping and the impact of fire in the burned area.
Three land cover types were identified, namely vegetation, bare land and burned area by applying pixel based classification using the maximum likelihood algorithm in high-resolution aerial photographs (1m). Moreover, multispectral satellite Landsat data that were acquired close to capture date of the aerial photos and were converted to TOC reflectance from USGS, were used to measure the association between land cover portions and satellite-derived VIs and spectral signatures. A grid of 30x30m was created to extract the ratio of the land cover categories corresponding to each selected pixel of the satellite image LANDSAT TM. Samples of different land cover ratios and of different types of substrate (e.g. rocks, light- or dark-colored soil) were delineated and their reflectance values at each spectral channel were extracted and used to calculate statistics in order to characterize the spectral properties. Finally, various vegetation indices were computed to investigate the role of the proportion of land cover and substrate in the variation of VIs.
The results of our study reveal the spectral characteristics of burnt area at the pixel level and suggest the efficiency of certain spectral channels for the estimation of the percentage of unburned vegetation within fire affected pixels.