



Post-fire Vegetation regeneration mapping using Landsat TM imagery: the case study of Mt. Parnitha, Greece

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Accurate delineation on the geographical and temporal distribution of the extent of vegetation burning but also of the vegetation regeneration of a fire-affected site is of vital importance in many studies and relevant applications, to both scientists and policy makers.

The present work had as a primary objective to investigate the combined use of remote sensing imagery from Landsat TM sensor with Geographical Information Systems (GIS) for mapping the vegetation regeneration of a Greek region dramatically affected during the catastrophic fires of year 2007. A secondary objective had also been to analyse potential associations of vegetation regeneration to parameters such as topography and vegetation type.

For this purpose, the burnt area was first delineated on the basis of an image classification approach applied to the nearest post-fire TM imagery. Subsequently, a series of normalized difference vegetation index (NDVI) maps derived from a corresponding number of TM images were used to derive post-fire vegetation recovery for the entire burnt area scar and for individual vegetation types. Post-fire NDVI spatial patterns on each image date were compared to the pre-fire pattern to determine the extent to which the pre-fire pattern was re-established, and the rate of this recovery.

Results indicated that a low to moderate post-fire recovery, with the post-fire NDVI spatial pattern showing generally a gradual systematic return to pre-fire conditions. Individual vegetation types exhibited similar characteristics in terms of recovery, with north-facing sloped areas exhibiting a slightly faster recovery rates. All in all, results revealed the ability of the combined use of the NDVI-based approach combined with TM imagery and the GIS for mapping the broad vegetation regeneration of the fire-affected area, as well as its potential to be easily transferred to other cases in the future.

KEYWORDS: vegetation regeneration, Landsat TM, Greece, vegetation fires, ASTER DEM, CORINE 2000, Mt. Parnitha