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Vegetation re-growth detection in the lythrodontas region (centre Cyprus) after a forest fire using Landsat tm and ETM+ data.

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Obtaining quantitative information about the recovery of fire affected ecosystems is of utmost importance from the management and decision-making point of view. Nowadays he concern about natural environment protection and recovery is much greater then in the past. However, the resources and tools available for its management are still not sufficient. Thus, attention and precision is needed when decisions must be taken. Quantitative estimates on how the vegetation is recovering after a fire can be of help for evaluating the necessity of human intervention on the fire-affected ecosystem, and their importance will grow as the problem of forest fires, climate change and desertification increases.

This article performs a comparison of methods to extract quantitative estimates of vegetation cover regrowth with Landsat TM and ETM+ data in a centre Cyprus area that burned during the summer of 2001. In order to eliminate possible sources of error, a thorough pre-processing was carried out, including a careful geometric correction (reaching RMSE lower than 0.3 pixels), a topographic correction by means of a constrained Minnaert model and a combination of absolute and relative atmospheric correction methods. Pseudo Invariant Features (PIF) were identified by implementing an automated selection method based in temporal Principal Components Analysis

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(PCA), which has been called multi-Temporal n-Dimensional Principal Component Analysis (mT-nD-PCA).

Spectral Mixture Analysis (SMA) was compared against quantitative vegetation indices which are based in well known traditional vegetation indices like Normalised Difference Vegetation Index (NDVI) and Modified Soil Adjusted Vegetation Index (MSAVI). Accuracy assessment was performed by regressing vegetation cover results obtained with each method against field data gathered during the field work campaigns carried out in the study area. Results obtained showed how vegetation cover fractions extracted from the NDVI based quantitative index were the most accurate, being superior to the rest of the techniques applied, including SMA.