Geophysical Research Abstracts,
Vol. 11, EGU2009-12777, 2009
EGU General Assembly 2009

Rapid Analysis Of Wildfire Impacts Using ASTER Data And Support Vector Machines: A Case Study From the Greek Fires Season Of Summer 2007

G. Petropoulos (1), W. Knorr (1), M. Scholze (1), L. Boschetti (2), and G. Karantounias (3)

(1) Department of Earth Sciences, University of Bristol, Willis Memorial Building, Queens Road, BS8 1RJ, United Kingdom (george.petropoulos@bristol.ac.uk), (2) Department of Geography, University of Maryland, 2181 LeFrak Hall, College Park, MD 20740, USA, (3) Department of Natural Resources Development and Agricultural Engineering, Agricultural University of Athens, 75, Iera Odos St., 11855, Athens, Greece

The present study investigates the use of support vector machine (SVM) classification methods with multispectral data from the Advanced Spectral Emission and Reflection Radiometer (ASTER) for obtaining rapid and cost effective cartography of fuel types and burn scars in a Mediterranean setting. A further objective is to perform a detailed intercomparison of available burned area datasets for one of the most catastrophic forest fires that occurred near the Greek capital during the summer of 2007. Two ASTER multispectral images were acquired, one before and one closely after the fire episode. Fuel type and burned area maps were obtained by classifying each ASTER image into a number of discrete classes based on the Prometheus fuel model system. Training of the SVM classifier and accuracy assessment of derived fuel type maps was done using information from CORINE2000 land cover classification system. Accuracy assessment of the fuel type maps yielded an overall accuracy of 94.6% and a mean Kappa coefficient of 0.93, results comparable to or better than those reported by previous studies using parametric classification methods with ASTER data, or SVM classifiers with hyperspectral and LiDAR data. Fuel classes for the area under the envelope of the burned area extracted from the pre-fire ASTER image were in reasonable agreement with those reported by the local inventories by the Greek Forest Office and principally those from the European Forest Fire Information System (EFFIS). Reported total burned area by the independent sources on average deviated by 14% from the ASTER-derived estimate. Results confirmed the suitability of ASTER data in combination with SVM classifiers and the CORINE land information system as a means for rapid and low cost fuel type mapping and post-fire assessment.

Keywords: burned area mapping, fuel types, support vector machines, ASTER, MODIS burned area product, EFFIS, Greek fires 2007