Geophysical Research Abstracts
Vol. 13, EGU2011-7900, 2011
EGU General Assembly 2011

Estimating effectiveness of spectral index for burned area mapping

Fortunato De Santis, Rosa Lasaponara, and Antonio Lanorte
CNR-IMAA Tito Scalo PZ - Italy (desantis@imaa.cnr.it)

Remote sensing technologies can provide useful data for fire management from risk estimation (Lasaponara 2005), fuel mapping (Lanorte and Lasaponara, 2006) fire detection (Lasaponara et al., 2003), to post fire monitoring (Telesca and Lasaponara 2006, Telesca et al. 2007). In particular, satellite data may allow us to develop burn-severity maps (see 11,12,13). The methods generally used to estimate fire severity from satellite are based on fixed threshold values, which are not suitable for fragmented landscape and vegetation types, or geographic regions different from those they were devised. A new approach based on satellite and geo-statistical analysis is herein proposed for burn severity mapping.
For the purposes of this study satellite ASTER data have been used. ASTER is a high resolution imaging instrument flying on Terra, a satellite launched in December 1999, as part of NASA's Earth Observing System (EOS). It has the highest spatial resolution (15 meters VNIR) of all five sensors on Terra and collects data in the visible/near infrared (VNIR), short wave infrared (SWIR), and thermal infrared bands (TIR). Each subsystem is pointable in the crosstrack direction.
In this study, both single (post-fire) and multi-date (pre and post fire) ASTER images were processed for some test areas in Southern Italy for the 2010 fire season.
Several vegetation indices were computed from ASTER data in order to evaluate their effectiveness to identify and map burnt areas: (i) SVI (Simple Vegetation Index), (ii) TVI (Transformed Difference Vegetation Index), (iii) SAVI (Soil Adjusted Vegetation Index), (iv) NDVI (Normalized Difference Vegetation Index), (v) Normalized Difference Burn Ratio. The evaluation of Spectral separability enabled us to statistical characterize the effectiveness of each index .

Ref

Telesca, L; Lanorte, A; Lasaponara, R Investigating dynamical trends in burned and unburned vegetation covers using SPOT-VGT NDVI data : JOURNAL OF GEOPHYSICS AND ENGINEERING Volume: 4 Issue: 2 Pages: 128-138 Published: JUN 2007

Lasaponara, R; Lanorte, A On the capability of satellite VHR QuickBird data for fuel type characterization in fragmented landscape ECOLOGICAL MODELLING Vol. 204 79-84 2006

Lasaponara, R Inter-comparison of AVHRR-based fire susceptibility indicators for the Mediterranean ecosystems of southern Italy INTERNATIONAL JOURNAL OF REMOTE SENSING Vol: 26 853-870 2005

Lasaponara, R; Cuomo, V; Macchiato, MF, et al A self-adaptive algorithm based on AVHRR multitemporal data analysis for small active fire detection INTERNATIONAL JOURNAL OF REMOTE SENSING Vol24 : 1723-1749 2003

Telesca, L; Lasaponara, R Pre- and post-fire behavioral trends revealed in satellite NDVI time series GEOPHYSICAL RESEARCH LETTERS Vol. 33 Article Number: L14401 2006