The 36th International Symposium on Remote Sensing of Environment,
11 – 15 May 2015, Berlin, Germany, ISRSE36-526

Understanding the role of vegetation fires in land cover change dynamics in Eastern Africa

I. Palumbo, W. Temperley, M. Graziano, A. Brink

DG Joint Research Centre – European Commission, Institute of Environment and Sustainability -
ilaria.palumbo@ext.jrc.ec.europa.eu

THEME: We would like to contribute to the Forests, Biodiversity and Terrestrial Ecosystems, in the special session on "Biodiversity and Conservation"

KEY WORDS: land-cover, fire, biodiversity, MODIS, Africa

ABSTRACT:

In many regions worldwide, particularly in Africa, fire is used as a land management tool and has a specific role in shaping and maintaining some ecosystems and natural resources. In protected areas prescribed burning is often used to preserve the natural habitats and keep a high variety of ecosystems and biodiversity, whereas outside protected areas fire is commonly used to maintain pasturelands and create new areas for agriculture. Therefore, information about burning patterns is essential to understand land cover dynamics and the status of natural resources and habitats.
In this study we analyse time-series of MODIS active fire data and land cover change to assess how fire is associated to natural vegetation dynamics in eastern Africa. The information about land cover change is provided by the Geoland-2 project (EU-funded, 7th Framework Programme). The project used Landsat and other high resolution imageries over the period 1990-2010 to derive the 'loss' and 'gain' of natural vegetation in sample boxes of 20km × 20km located at each half degree of a regular grid. The analysis determined the land cover change in three reference years: 1990, 2000 and 2010. In this study we consider the land cover change occurred in 2000-2010 and the annual fire occurrence from 2002 to 2010. Fire occurrence is derived from the MODIS active fire product (NASA-FIRMS) which provides daily observations from the AQUA and TERRA platforms. For each sample box and class of land cover\change we derive the annual fire counts and assess their statistical correlation to identify the land cover\change where fire acts as a driver or it contributes to maintain ecosystems. Since the sample boxes include also protected areas these results provide also insights about the role of fire in ecosystems and biodiversity. Moreover, the correlations found between fire occurrence and land cover\change can be used to identify areas potentially affected by natural vegetation loss in the future.