Geophysical Research Abstracts
Vol. 12, EGU2010-15356, 2010
EGU General Assembly 2010

Fire activity inside and outside protected areas in Sub-Saharan Africa: a continental analysis of fire and its implications for biodiversity and land management

Ilaria Palumbo, Jean-Marie Gregoire, Dario Simonetti, Mihkel Punga, and Gregoire Dubois
oint Research Centre, Ispra, Italy (ilaria.palumbo@jrc.ec.europa.eu)

Fire is an important ecological factor in many natural ecosystems. Without doubt one of the biomes with the highest fire activity in the world is the African savannah. Savannahs have evolved with fires since climate in these regions is characterized by definite dry and wet seasons that create the conditions for burning. During the wet months the herbaceous vegetation shows a quick growth, followed by a long dry period during which the abundant build-up of fine materials becomes highly flammable and most of fires occur. Animals and plants are adapted to these conditions and their lives depend on recurrent fires. In this context fire becomes an essential element to promote biodiversity and nature conservation. Park managers are using programmed fires as a tool to maintain the habitats and favorable conditions to the animal communities.

Satellite products like burned areas and active fire maps are a valuable mean to analyze the fire activity and provide support to experts working for conservation and natural resource management.

In the framework of the Digital Observatory for Protected Areas (DOPA), the MONDE group (Monitoring Natural Resources for Development) of the Joint Research Centre of the European Commission is using satellite products to analyze the fire occurrence and its effects on protected areas located in sub-Saharan Africa. Information on the fire activity was derived from the MODIS fire products (active fires and burned areas) and allows the DOPA to provide support to park managers as well as to experts working for conservation and natural resource management.

We assessed 741 protected areas classified by the IUCN (International Union for Conservation of Nature) with a level of protection between class I and IV. The MODIS datasets are available since the year 2000 and were used to characterize the spatio-temporal distribution of fires over a period of 10 years. Information on fire activity was extracted for the protected areas and a 25km buffer zone around each of them. The region outside the protected areas was used for comparison in order to identify differences or similarities between their fire activities. This also contributed to understand how management and conservation influence fire and assess the level of isolation of the protected areas. The long time series allowed the identification of trends and the interannual variability of the fire activity.

The dry season length was determined using FEWS RFE rainfall data (implemented at NOAA's Climate Prediction Center). Within each dry season we identified three periods (early, middle and late) in order to characterize the climatic and environmental conditions at which fires occur and identify trends and patterns. Every period of the dry season lasts two months and shows different conditions of temperature and drought level.

Fire activity was characterized combining the information on active fires and burned areas. For each year we determined the fire seasonality, the fire frequency, the main vegetation types affected, the extent and intensity of burning.

This information was also used to distinguish management fires from those related to other human activities like transhumance, agriculture and poaching in order to identify possible sources of threat to the protected areas. Information on the road network, the location of villages and cultivated fields were also included.

Future work will include a combined analysis of fire activity and land-cover, land-cover change information so that management plans adopted in protected areas can be evaluated in their effectiveness to promote biodiversity and nature conservation.