Geophysical Research Abstracts
Vol. 15, EGU2013-10913, 2013
EGU General Assembly 2013

Global surface Albedo changes due to anthropogenic biomass burning activities in Africa

Gerardo López-Saldaña, Ioannis Bistinas, and Jose Miguel Pereira

Universidade Técnica de Lisboa, Instituto de Agronomia, Centro de Estudos Florestais, Lisboa, Portugal (gerardolopez@isa.utl.pt)

Land surface Albedo is a key parameter to derive Earth-s surface energy balance, is used as well in the parameterization for numerical weather prediction, climate monitoring and climate change impact assessment. In terms of vegetation in land ecosystems modeling is widely used also.

Areas affected by fire and coresponding albedos were derived using the the Advanced Very High Resolution Radiometer (AVHRR) long-term data record (LTDR). The analysis was performed for a strong El Niño year, 1998, in which fire activity showed a positive anomaly. The main goal of this study is to quantify the changes in albedo due to anthropogenic biomass burning activities and the associated shortwave radioactive forcing.

The study emphasizes on the croplands and pastures of Africa in order to focus only on the anthropogenic land use transformation and highlight the human influence on the radiative forcing due to fire.

The analysis reveals a positive forcing that increases the surface temperature in agricultural areas where we see high burnt area fraction on an annual basis. Even though an additional more extended study is needed over a longer period, including years without El Nino events, we see the evident influence of humans on albedo changes due to fire.

This study can contribute into a better representation of the anthropogenic influence on the global surface energy balance due to land use practices in Africa, and lead to a better understanding of surface albedo as a possible model input for global energy balance models.