Geophysical Research Abstracts Vol. 20, EGU2018-15283, 2018 EGU General Assembly 2018 © Author(s) 2018. CC Attribution 4.0 license.



Pixel size effect assessment for burned area mapping over Africa

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Biomass burning is a key element of the terrestrial carbon cycle and a significant source of atmospheric trace gases and aerosols. Depending on their size, location and timing, fires significantly modify land surface properties, influence atmospheric chemistry and air quality, through aerosol and gas emissions, while modifying albedo by land use transformations.

Satellite Earth observation has been used extensively to detect burned areas (BA) and active fires. In recent years, several global BA products have been made available to the international community, all of them based on coarse resolution sensors that make possible only the detection of large burned areas. In this context, a new burned area mapping algorithm was developed under the scope of the European Spatial Agency (ESA) fire_cci project (http://www.esa-fire-cci.org/) using Sentinel-2 Multi Spectral Instrument (MSI) (20 m).

The effect of the pixel size when detecting burned areas was analyzed in this research. Sentinel-2 MSI images were resampled (originally at 20m) in order to simulate the effect on the same burned area algorithm on Landsat, Proba-V or MODIS spatial resolutions (30, 100 and 500 metres). Results were assessed with reference perimeters created by visual analysis in 52 validation sites through all Africa.