Geophysical Research Abstracts
Vol. 16, EGU2014-11781, 2014
EGU General Assembly 2014

MODIS 250M burnt area detection algorithm: A case study applied, optimized and evaluated over continental Portugal.

Bernardo Mota (1), Akli Benali (2), and Jose Miguel Pereira (2)

(1) King's College London, Department of Geography, London, United Kingdom (bernardo.mota@kcl.ac.uk), (2) Forest Research Centre, University of Lisbon, Tapada da Ajuda, Portugal

The dependence on satellites to derive burnt area (BA) maps is unquestionable. High resolution inventories normally result from change detection algorithms applied to pre and post fire season high resolution imagery. But these have no temporal discrimination within the occurring season. Limited to the larger fire scars, coarser resolution imagery based on reflectance or thermal information can help to map the individual fire progression. The Moderate Resolution Imaging Spectroradiometer (MODIS) 250m imagery bands, freely available, can be used to provide quick areal estimates and provide the needed temporal discrimination with four times the standard spatial resolution BA products. The scope of this study is to assess the spatial and temporal accuracy of burnt area maps derived by the MODIS 250m resolution Burnt Area algorithm (M250BA) presented by Mota *et al.*, (2013) on an Mediterranean landscape. The algorithm is an improved adaptation of one of the burnt area algorithms developed within the scope of the Fire_CCI project and was applied to an area covering continental Portugal for the period of 2001-2013. The algorithm comprises a temporal analysis based on change point detections and a spatial analysis based on Markov random fields. We explored the benefits of applying standard optimization techniques to the algorithm and achieved significant performance improvements.. Temporal and spatial accuracy assessments were performed by comparing the results with spatial and temporal distribution of active fire maps and with high resolution burnt area maps, derived by the MCD14ML thermal anomalies dataset and by Landsat BA classifications, respectively. Accuracy results highlight the potential applications for this BA algorithm and the advantages of using 250m spatial resolution images for BA detection. The study also extends the current national burnt area atlas since 2010. Due to the open-access data policy, the algorithm can be easily parameterised and applied to any region of the globe with potential high accuracy. The finer resolution combined with the flexibility of the algorithm is an advantage, not only to detect smaller burnt scars in regions where fuel load can be high, but also to fill the temporal gap between the Fire_CCI project MERIS BA product and future BA products derived from optical sensor imagery onboard the Proba-V and Sentinel-3 satellites.