



## Spatial and temporal characteristics of fire patterns in the Cerrado using 18 years of satellite observations

Julia A. Rodrigues<sup>1\*</sup>, Patrícia S. Silva<sup>2</sup>, Renata Libonati<sup>1</sup>, Allan A. Pereira<sup>3</sup>, Joana M. P. Nogueira<sup>4</sup>, Guilherme Martins<sup>4</sup>, Filipe L. M. Santos<sup>1</sup>, Leonardo F. Peres<sup>1</sup>, Duarte Oom<sup>5</sup>, Carlos DaCamara<sup>2</sup>, José M. C. Pereira<sup>6</sup>, Alberto Setzer<sup>4</sup>

**ABSTRACT** – The Brazilian Cerrado vegetation has been increasingly threatened over the last decades and the significant loss of ~50% in its native cover is also related in part to the absence of a consistent fire policy in the region. Although the Cerrado is adapted to natural fires the significant changes in fire regimes might alter this biome irreparably. With future projections of a drier and warmer climate, it is thus crucial to understand how fire regimes are evolving to allow a better management and allocation of resources. Satellite technology currently provides a tool to effectively study fire regimes through the identification of active fires and burned areas (BA). Here we use the MODIS MCD64A1 Collection 6 product to evaluate BA patterns in Cerrado over the last 18 years (2001-2018). Intra and inter-annual variabilities are assessed along with spatial analysis, with special focus on the existing Conservation Units; the existence of significant trends and shifts are also investigated. Results show that the dry period from August to October accounts for around 60% of the total BA. Fire extent varies considerably from year to year showing a strong dependence on climatic conditions, which are responsible for more than 2/3 of the interannual variability of burned area for the last two decades. Very distinct patterns for its South-western and North-eastern and regions are seen, with negative and positive trends, respectively. The latter region is the new agricultural frontier with extensive and mechanized farms, whereas the former has mostly been cleared of native vegetation and is now dominated by grasslands and small-scale croplands. Conservations units near by the Arc of Deforestation and the new agriculture frontiers of MATOPIBA present the higher amount of burned area.

**Keywords:** Remote sensing; Cerrado; burned area; MODIS MCD64A1; fire patterns

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<sup>1</sup> Departamento de Meteorologia, Instituto de Geociências, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil, <sup>2</sup> Instituto Dom Luiz, Faculdade de Ciências, Universidade de Lisboa, Lisboa, Portugal <sup>3</sup> Instituto Federal de Educação, Ciência e Tecnologia do Sul de Minas Gerais, Poços de Caldas, Brazil <sup>4</sup> Programa de Monitoramento de Queimada por Satélites, Instituto Nacional de Pesquisas Espaciais, São José dos Campos, Brazil, <sup>5</sup> Joint Research Centre, European Commission, Ispra, Italy, <sup>6</sup> Centro de Estudos Florestais, Instituto Superior de Agronomia, Universidade de Lisboa, Lisboa, Portugal, \*E-mail address: [abrant.julia@gmail.com](mailto:abrant.julia@gmail.com)