

Vegetation recovery analysis over areas managed with prescribed fires: an approach using remote sensing data

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ABSTRACT- Prescribed burning (PB) is a commonly used technique to reduce fuel loads, where fire is introduced under specific and controlled conditions before fire season, thus mitigating the risk and the adverse effects of wildland fire, and the associated high suppressions costs. Fire management agencies require estimations about recovery time over areas under prescribed fire activities in order to determine the extent and spatiotemporal pattern of required actions needed to reduce future fire risk. Post-fire dynamics is a complex phenomenon in which remote sensing techniques play a significant role, providing the opportunity to study fire effects and vegetation recovery over large areas on a long-term basis. In 2014, PB under the scope of the Integrated Fire Management (IFM) were started in some Conservation Units located at Cerrado. However, until now, there is a gap in studies investigating how vegetation behaves after those prescribed fires using satellite data. Therefore, here we aim to estimate and evaluate the vegetation recovery rate over areas managed with prescribed fires based on satellite-derived indexes. Time-series of spectral indices, such as Normalized Burn Ratio (NBR), Normalized Difference Vegetation Index (NDVI), Enhanced Vegetation Index (EVI), Soil Adjusted Vegetation Index (SAVI) and Burn Recovery Ratio (BRR), are derived from multi-spectral Landsat surface reflectance imagery through Google Earth Engine platform. Special attention is devoted to the identification of which factors are most important for the recovery process. The duration of the effectiveness of fuel reduction due to PB activities is analysed between 2010 and 2018, in order to verify pre e post-IMF conditions. By evaluating the vegetation post-fire recovery time we envisage the construction of indicators about the longevity of the inhibitory effect of PB, allowing the quantification of its impacts on the incidence, severity and extent of unplanned fires. Thus, this work may provide clear directions in the IFM related to PB.

Keywords: Prescribed burning; burned areas; post-fire; vegetation recovery

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