Normalized Difference Vegetation Index (NDVI) and Vegetation Condition (VCI) of the Tadarimana Indigenous Land to Identify Susceptible Areas to Forest Fire

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ABSTRACT – Forests fires can occur in a natural way in the dry season, aggravated by anthropic practices. Remote sensing and geoprocessing techniques demarcate and spatialize land surface data making possible the study and monitoring this areas. It's intended to subsidize managers of environmental and civil defense agencies, in terms of methodological routine, aiming to set preventive and reactive actions, in terms of combating fires in the Tadarimana Indigenous Land (TIT), in Rondonópolis, Mato Grosso, Brazil. August 27, 2017, a forest fire occurred in the TIT, which consumed 5,203,493 hectares of native vegetation, causing several damages to the local biodiversity. This episode was the motivating element of the research. Seven scenes from the Landsat-8 satellite were utilized, understanding the months from april to november 2017. To characterize the aspects of vegetation vigor and vulnerability to fire, was used the Normalized Difference Vegetation Index (NDVI), considering the minimum and maximum values of NDVI. Rainfall and heat spot source data provided by the Instituto Nacional de Pesquisas Espaciais (INPE) were also used in the analysis. Was generate NDVI maps with bands 4 (Red) and 5 (NIR), circling the official limits of TIT and its surroundings (1000 m buffer). For the months of april and november, the average rainfall was 0.807 and 0.817 mm respectively. In july and august the values decreased by 0.645 and 0.591mm. In september there was the lowest NDVI value (0.48), which can range from -1 to +1. Around TI, the month of april presented NDVI value of 0.716. Two hot spots dated august 27 were identified inside the TIT and not around it (1000 m buffer). From this results, it's possible to determine the beginning of a critical period to intensify the environmental monitoring at TIT before the occurrence of fires. For example, august 2017, with a minimum NDVI values of -0.749, most critical fires prevention actions could be implemented.

Keywords: forest fire, vegetation index, remote sensing.