



Fire propagation model for Cerrado Biome

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ABSTRACT—To date, there are no model available for fire propagation in the Cerrado. Especially, for helping fire management and prevention, models need to run under near-real time conditions at a local scale. Here we present the first fire-spread model for helping fire management in three conservation units of the Brazilian Cerrado, i.e. Chapada dos Veadeiros, Serra da Canastra and Parque da Serra do Cipó. Our model incorporates high-resolution environmental data derived from satellite imagery to perform near-real time fire-propagation simulations. The model simulates fire intensity and speed and hence burnt areas by combining dry biomass and climatic data. To predict fire spread behavior, our model calculates Bayesian probability based on the region's fire event history. This calculation increases the model prediction hit rate. Our model also has a probabilistic module, in which a Monte Carlo test is performed to estimate the probability of fire events under different conditions. The interface of the model is very user-friendly, consisting of a tutorial self-explanatory wizard with few steps to setup the simulations that do not take long to run on a laptop computer in spite of the model high spatial resolution. In our tests, performed in the three parks, we obtained a high rate of accuracy for the spatial predictions of fire events.

Keywords: Spatial model; fire management; fuel

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