Spatial Clustering of Vegetation Fire Intensity Using MODIS Satellite Data

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Abstract

This work analyses the spatial clustering of fire intensity in Zimbabwe, using remotelysensed Moderate Resolution Imaging Spectroradiometer (MODIS) active fire occurrence data. In order to investigate the spatial pattern of fire intensity, MODIS-derived fire radiative power (FRP) was utilized. A local indicator of spatial autocorrelation method, the Getis-Ord (Gi*) spatial statistic, was applied to show the spatial distribution of high and low fire intensity clusters. Analysis of the relationship between topographic variables, vegetation type, agroecological zones and fire intensity was done. According to the study's findings, the majority (44%) of active fires detected in the study area in 2019 were of low-intensity (cold spots), and the majority (49.3%) of them occurred in shrubland. High-intensity fires (22%) primarily occurred in the study area's eastern and western regions. The study findings demonstrate the utility of spatial statistics methods in conjunction with satellite fire data in detecting clusters of high and low-intensity fires (hot spots and cold spots).