

FACTORS INFLUENCING WILDFIRE OCCURRENCE AND DISTRIBUTION IN EASTERN KENTUCKY

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Most wildfires in Kentucky occur in the heavily forested Appalachian counties in the eastern portion of the state. These fires have been attributed to causes ranging from weather conditions to socioeconomic factors. We reconstructed a brief fire history of eastern Kentucky using Landsat TM and ETM+ images acquired between 1985 and 2002. We then examined relationships between fire frequency and area burned, and abiotic and human factors. Abiotic factors included Palmer Drought Severity Index (PDSI; negative values indicate drier conditions), slope, aspect, and elevation, and human factors such as county unemployment rates and distance to roads and populated areas. About 83 percent of the total area burned experienced fire only once, 14 percent twice, and 3 percent three times. More fires burned in the winter (January-March) fire season than in the fall (October-December) season, but the latter fires were larger on average and accounted for about 71 percent of the total area burned. Fire size was negatively correlated with the mean PDSI in both fire seasons. There was a higher frequency of burning both at higher elevations and on steeper slopes. There was no relationship between aspect and frequency of burning. Despite the perceived link between jobless claims in the region and frequency of fires, we found no correlations between monthly unemployment rates and arson-caused fires. The number of fires recorded was negatively correlated with both distance of fire to road ($p < 0.001$) and distance to populated area ($p < 0.001$).

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