Abstract

Wildfire is a growing problem in the United States that lends itself well to spatial analysis for those seeking to minimize human and environmental damages. This thesis analyzed spatio-temporal trends of wildfire in the state of Florida between the years of 1985–2014 and analyzed ecological and human demographic variables in relation to wildfire ignitions. Human population numbers, population growth, precipitation, and temperature affect the spatial distribution of wildfire. These changes can modify fire regimes in many areas, though the direction and extent of this influence is not fully understood. This research used correlation analysis to study the components of wildfire ignitions, separated into human and natural caused fires, visualized fire locations, and examined fire ignition hot spots in relation to the causes. It is hypothesized that population growth and population numbers positively influence the number of human caused wildfire ignitions, while high temperatures and low precipitation increase lightning caused fires. To create spatio-temporal maps and conduct the analysis, data on wildfire points, population counts, precipitation, and temperature were gathered and analyzed. Spatial analysis (e.g., Hot Spot Analysis (Getis-Ord Gi* statistic)) and non-spatial statistics (e.g., Pearson's correlation) were used to analyze statistically significant clustering of wildfire incidence. This thesis also used historical data to better recognize trends in wildfire occurrence and distribution. Wildfire management groups, already dealing with large fires every year, can use this information to become better prepared for future changes in wildfire incidences. The analysis revealed no significant correlations between the study variables and wildfire incidence. However, the research did reveal that there is significant clustering of wildfire ignitions due to human activity and lightning strikes.