Fire Vulnerability and Latino Populations in Orange County, CA

Introduction

California is experiencing an unprecedented drought. In many counties in California, Orange County included, real estate values are dropping in particularly drought stricken areas. These areas are becoming accessible to low income demographics. As a result, an increasing amount of low income homeowners are living in very dry areas. The drought also makes California more vulnerable to wildfires than ever before, and the driest areas are the most likely to burn. In Orange County, the Latino homeowners earn significantly less than non-Latino homeowners. This project aims to see if a disproportionately large amount of Latino home owners live in high fire-vulnerability areas in Orange County, California.

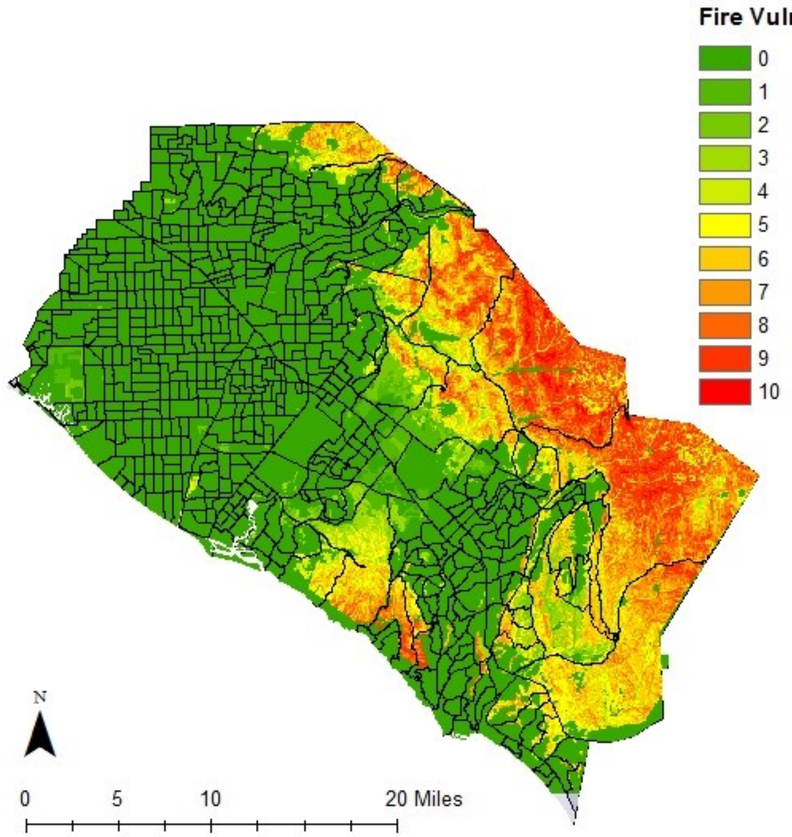
Methods

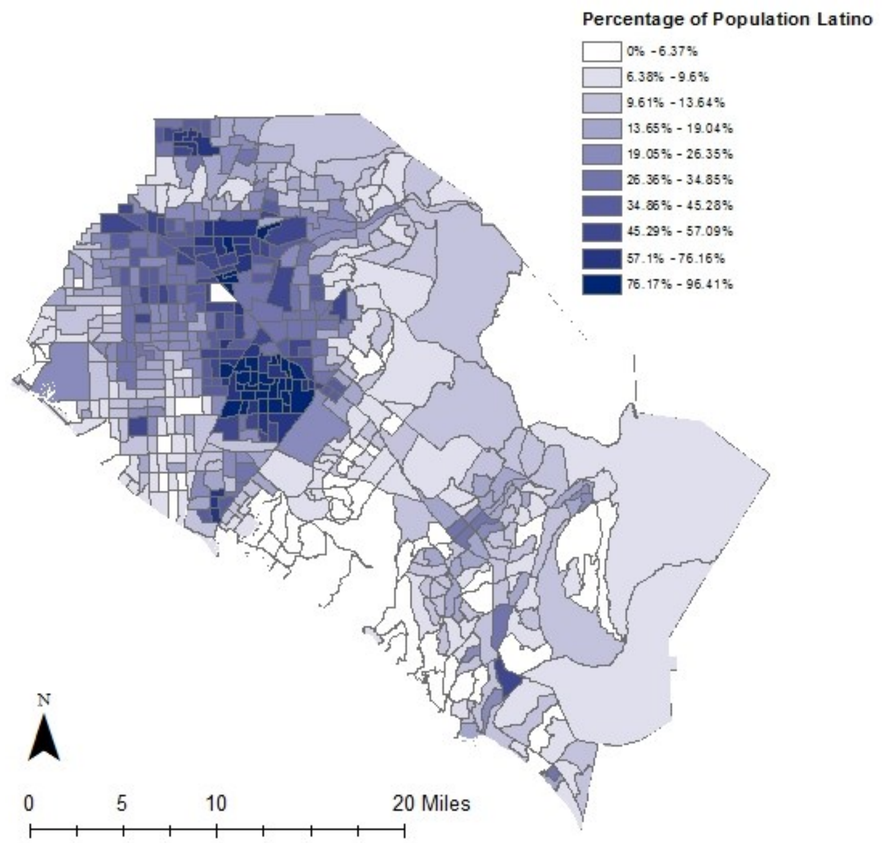
I used five factors to create a fire vulnerability analysis of Orange County. The factors I used are vegetation type, slope, wind speed, distance from water, and drought severity. Any data that was originally a polygon was converted to a raster and then all rasters were reclassified based on how they effect fire vulnerability. For slope, high slope was weighed to increase fire vulnerability. For land cover, vegetation types were weighed by two variables. First, how short the average radius of wood type in the area. This is common practice in fire protective services, as fuel with a smaller radius burns easier. The second variable was dryness. Wind class was weighed so that high wind speeds contributed to fire vulnerability. Longer distance from water was also weighed to increase fire vulnerability, as responding firefighter units use helicopters to put out budding fires with water from nearby ponds. Having a longer distance from water means having a longer response time. Finally, being in stage four drought was weighed above stage three drought in increasing fire vulnerability. All of Orange County is either in stage four or stage three drought.

Total population and Latino population were taken for all census tracts and the percentage of each tract's population that is Latino was found. Zonal statistics of each tract were then taken of each tract in regards to Latino population percentage and distance from fire-vulnerable zone.

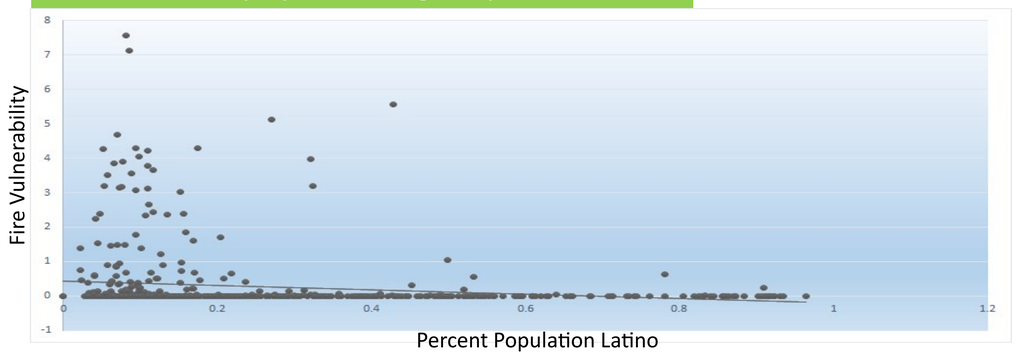
Conclusion

When visually comparing the fire-vulnerability map with the Latino population density map, it becomes clear that the two are not positively spatially correlated. If anything, the relationship appears inverse. Latino communities are clustered in the urban areas of north-central Orange County, far away from the fire-vulnerable suburban census tracts. The zonal statistics taken of the census tracts show that fire vulnerability is not a statistically relevant predictor of Latino population density.





Fire Vulnerability by Percentage Population Latino



Resources

Cartographer: West Foster
Class: ENV-107-01, Intro to GIS
Created December 17, 2015
Projection: NAD_1983_California_Teale_Albers (Metric)
Data collected from: Atlas.ca.gov, Census.gov, Drought.gov, Fire.ca.gov, NREL, and USGS
Special thanks to Sumeeta Srinivasan and Jessica Norris

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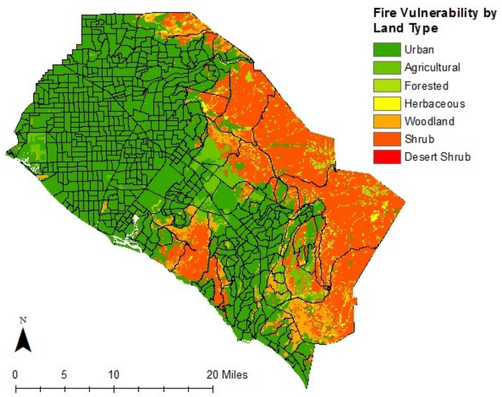
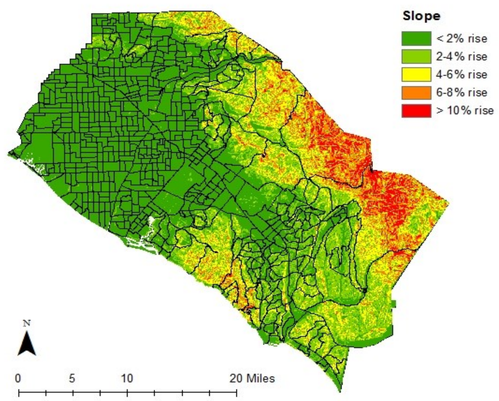
Fire Vulnerability Factors

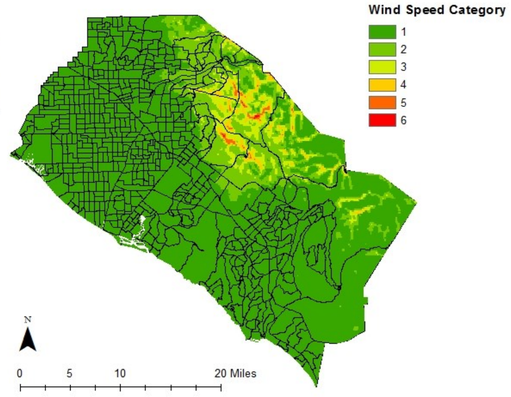
Vegetation Type



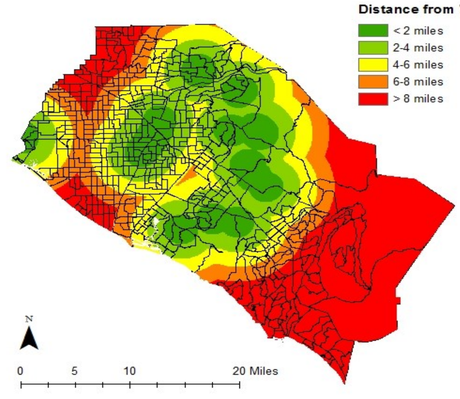
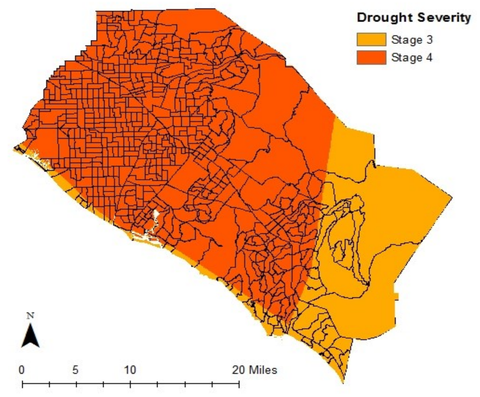
Slope



Wind Speed



Distance From Water



Drought Severity