

WINE AND WILDFIRE

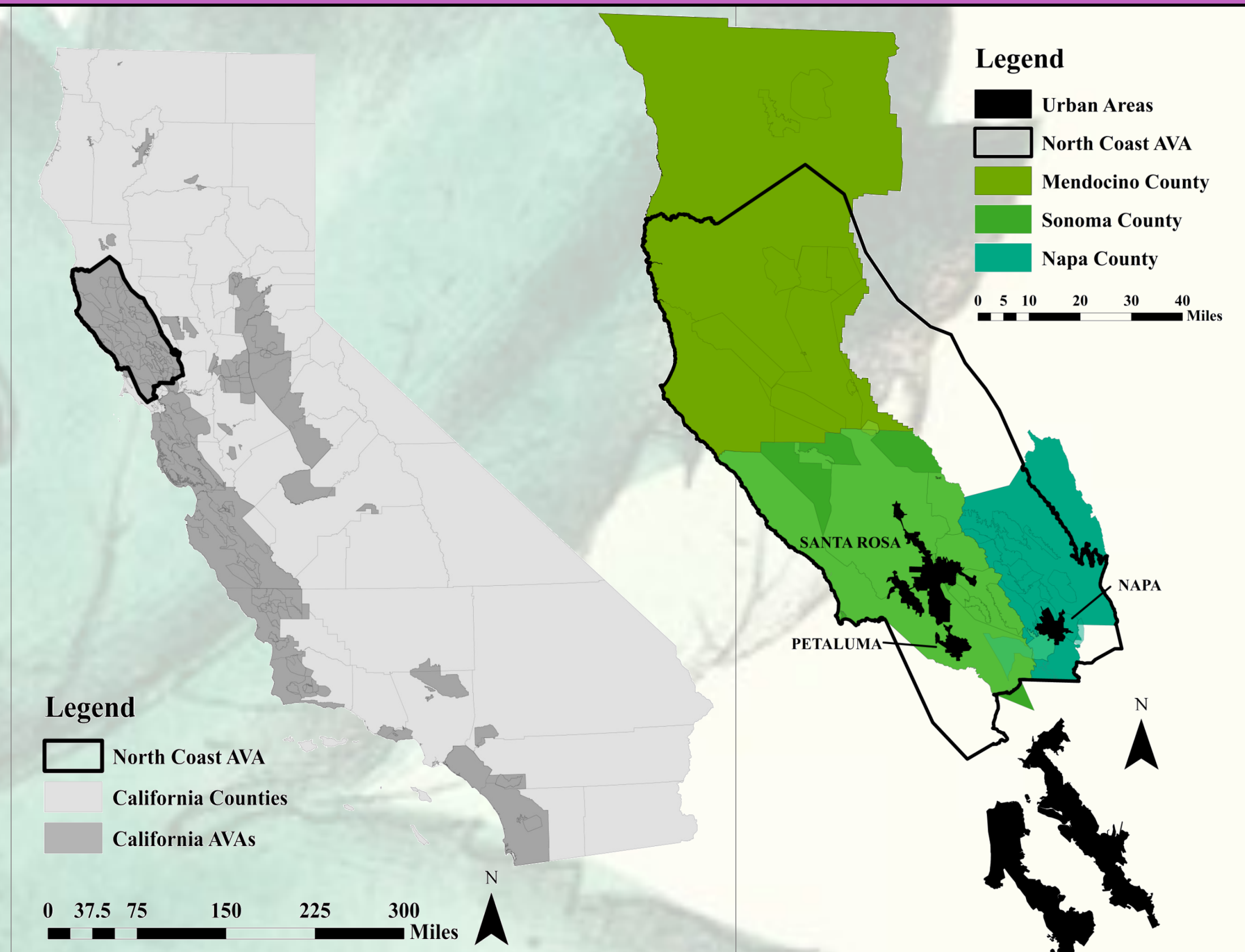
THE POTENTIAL IMPACT OF WILDFIRE ON WINE COUNTRY

Abstract

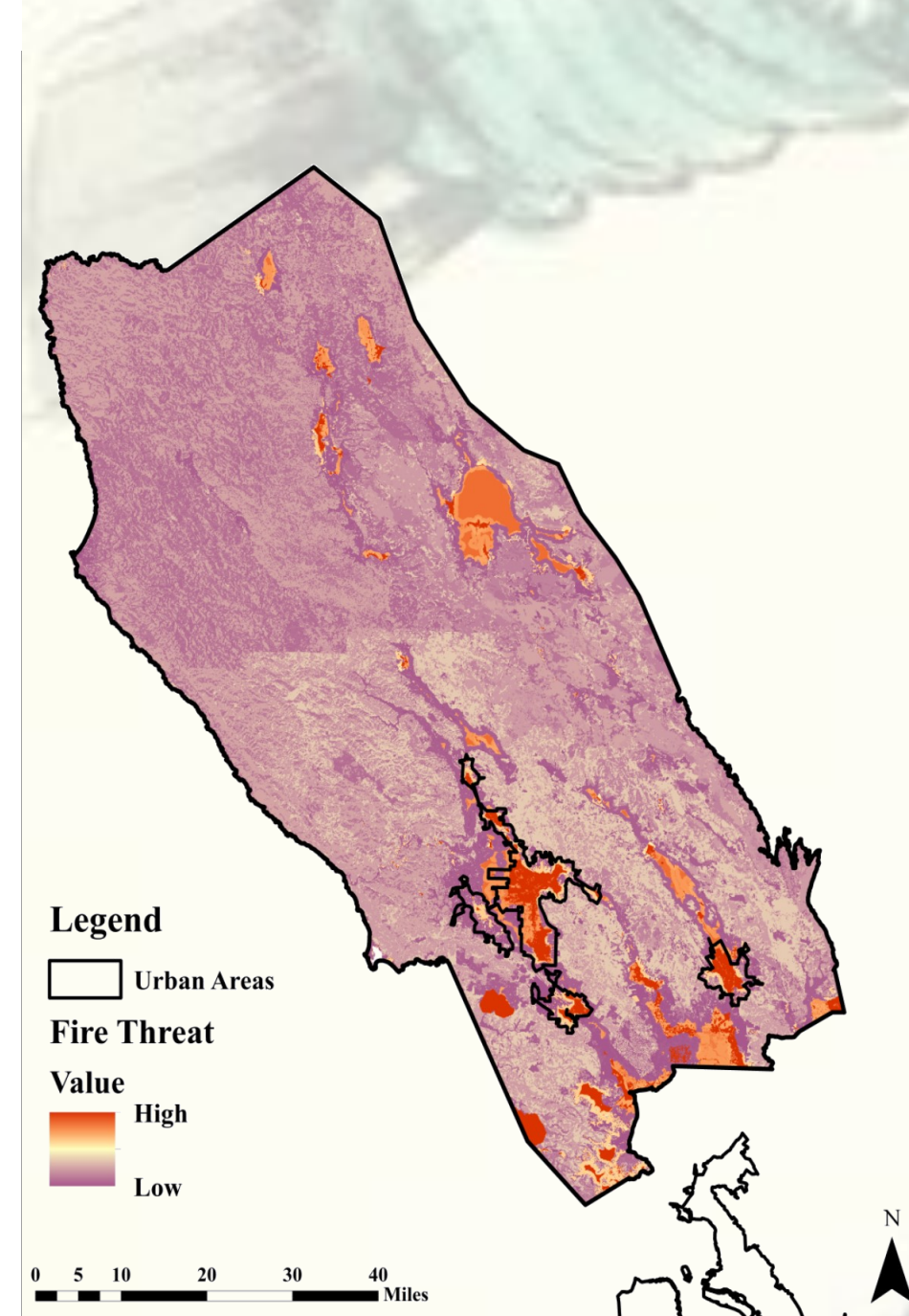
On November 8th of 2018, in Butte County, California, near the town of Paradise, a fire ignited. This was the beginning of the Camp Fire, which, after burning for over a week, became the deadliest and most destructive wildfire in the history of the state. It's common knowledge that California has had a long history of wildfires, but the Camp Fire begged the question, are wildfires getting worse? Just this year alone, California has experienced 6,154 fires that have consumed 872,786 acres of land (CAL FIRE, n.d.). I started to wonder how increased devastation from wildfire would affect the economy. Specifically, how would it effect the wine industry?

California produces around 90% of all the wine produced in America and is the fourth leading wine producer in the world after Italy, France, and Spain (Wine Institute, n.d.). Wine production is a large part of the economy on both the state and federal level. In California, the wine industry employs 325,000 Californians, generates \$56.7 billion annually in economic activity and \$7.2 billion annually in tourism expenditures, and pays \$7.6 billion in taxes. (Dunham, n.d.). If wildfires negatively impact the wine industry, it could spell disaster for the state's economy.

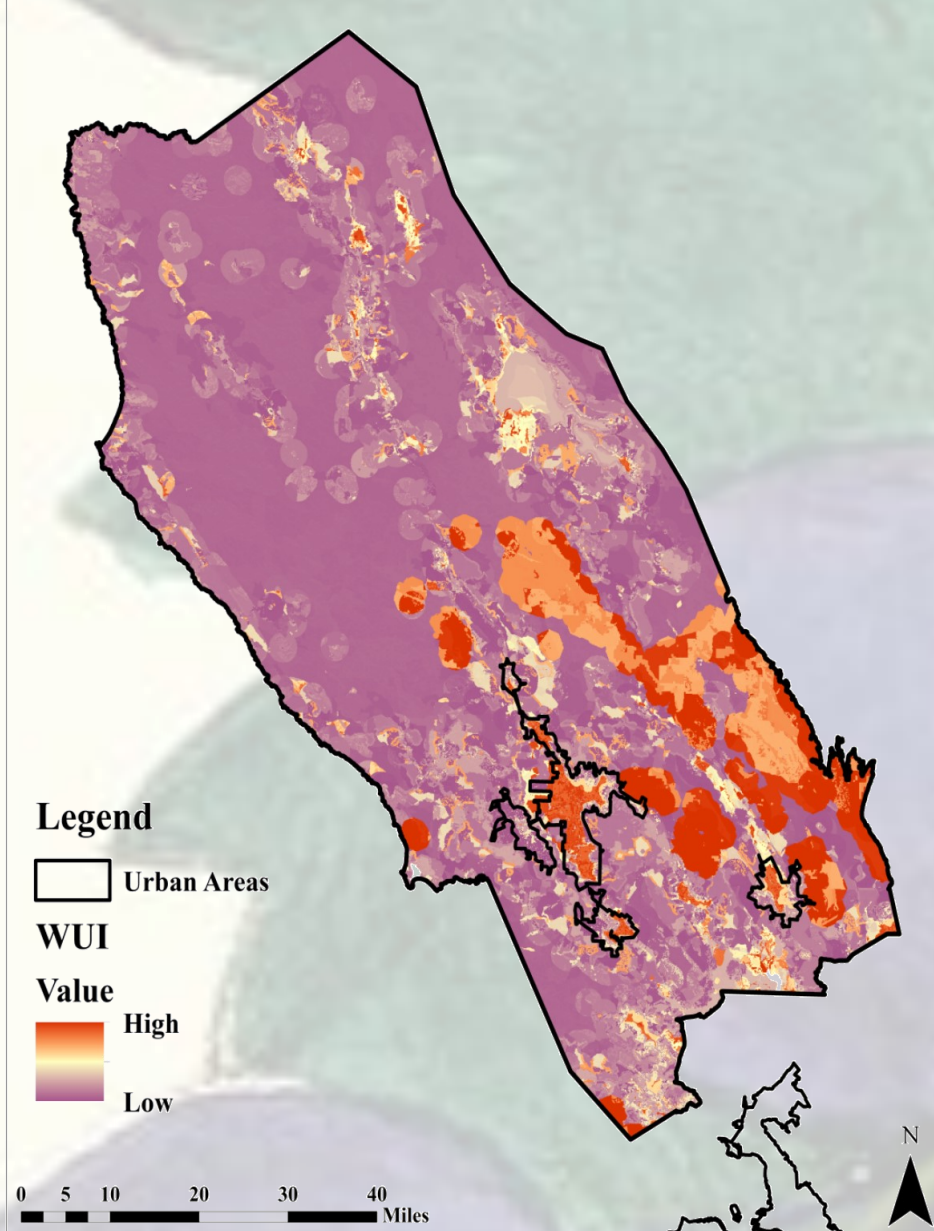
I'm specifically analyzing the wine counties of Mendocino, Sonoma and Napa. They lie within the North Coast American Viticultural Area, or AVA, which is a federally recognized growing region in California. The North Coast AVA is well-known for its production of high-quality wines (Geisseler, 2016). My questions are, how have wildfires impacted wine production infrastructure in the area? How may wildfires impact the wine industry in the future?



Fire Threat



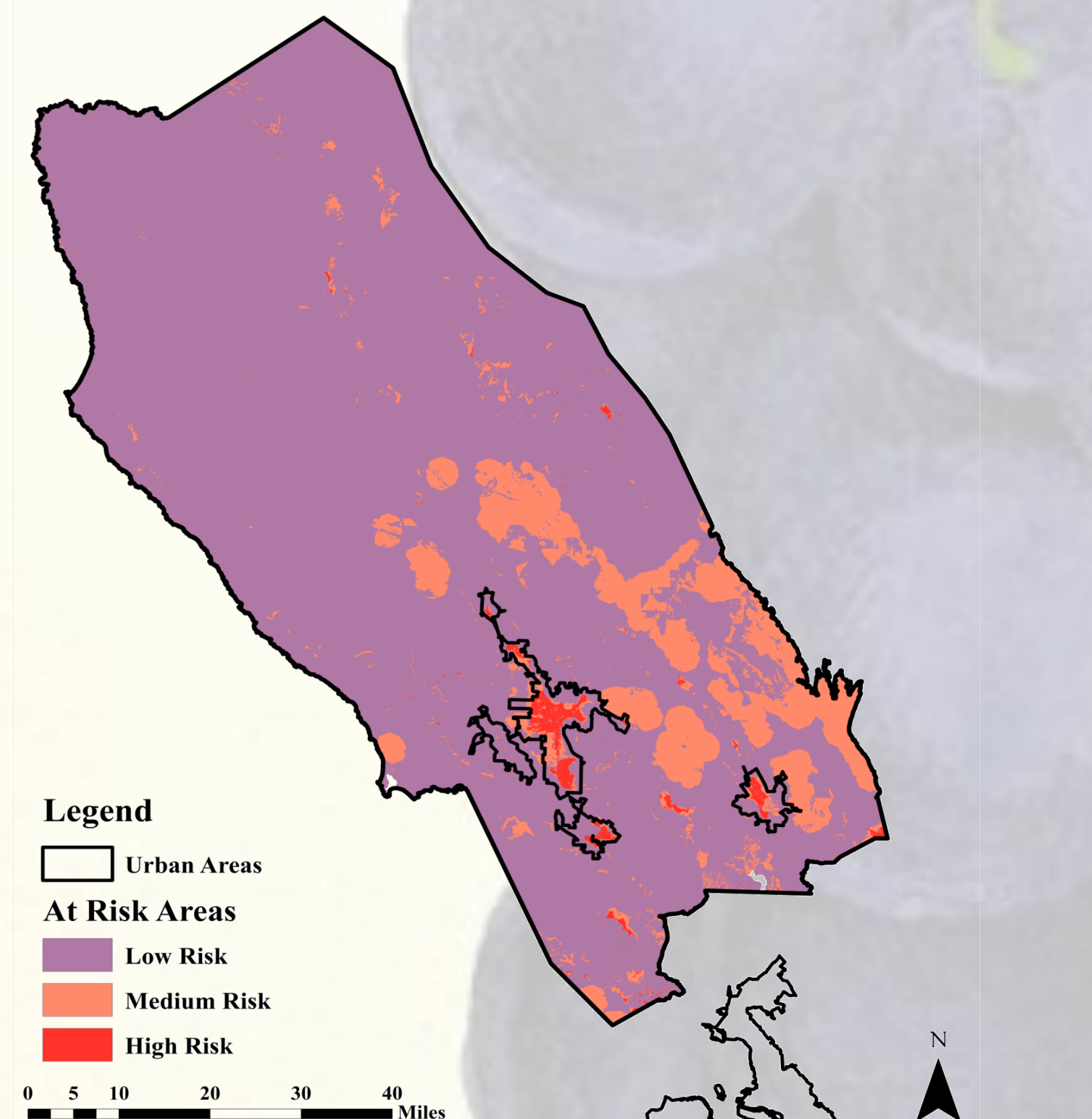
Wildlife Urban Interface (WUI) Threat



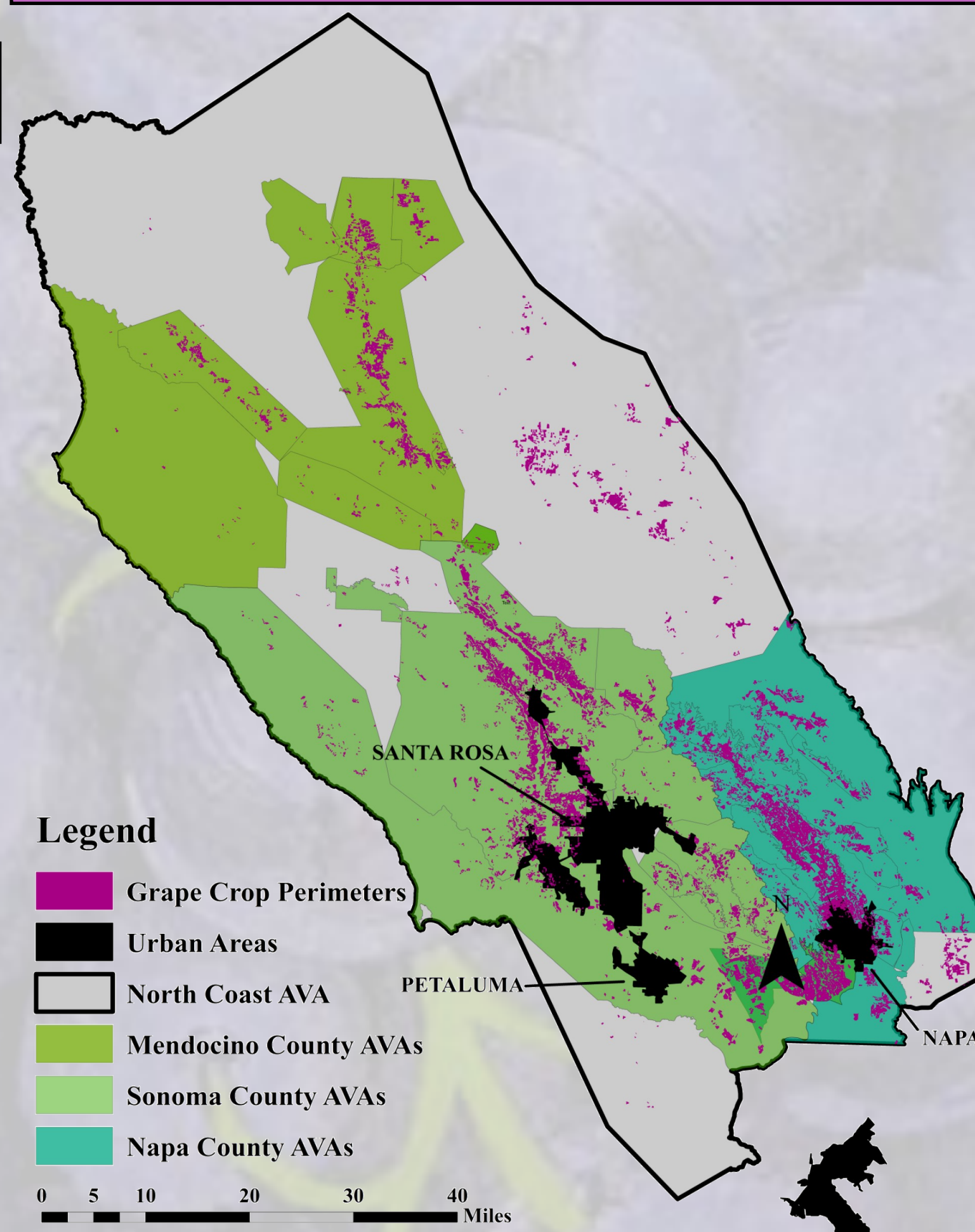
Methodology

- 1) First, I found vector layers for the AVAs within Mendocino, Sonoma and Napa counties.
- 2) California Department of Water Resources I found grape crop perimeters within the North Coast AVA.
- 3) Through CAL FIRE I found structural damage information for Sonoma County from 2017 wildfires, Fire Threat data for the state as well as Wildlife Urban Interface (WUI) threat for the state
- 4) Through the Napa County GIS Open Data Portal, I found structural damage from 2017 wildfires
- 5) Reclassified both CAL FIRE rasters, used the Raster Calculator to see where high Fire Threat and high WUI overlapped, creating an At Risk Areas layer with values of 0 (low risk), 1 (medium risk), and 2 (high risk)
- 6) Then, I created a Euclidean distance raster from the Grape Crop Perimeters layer, reclassified it so that areas <500 meters received a 1 and areas >500 meters received a 0.
- 7) Lastly, I used the Raster Calculator to multiply the At Risk Areas layer and the Euclidean Grape Crop Perimeters layer to get my final Level of Fire Risk layer

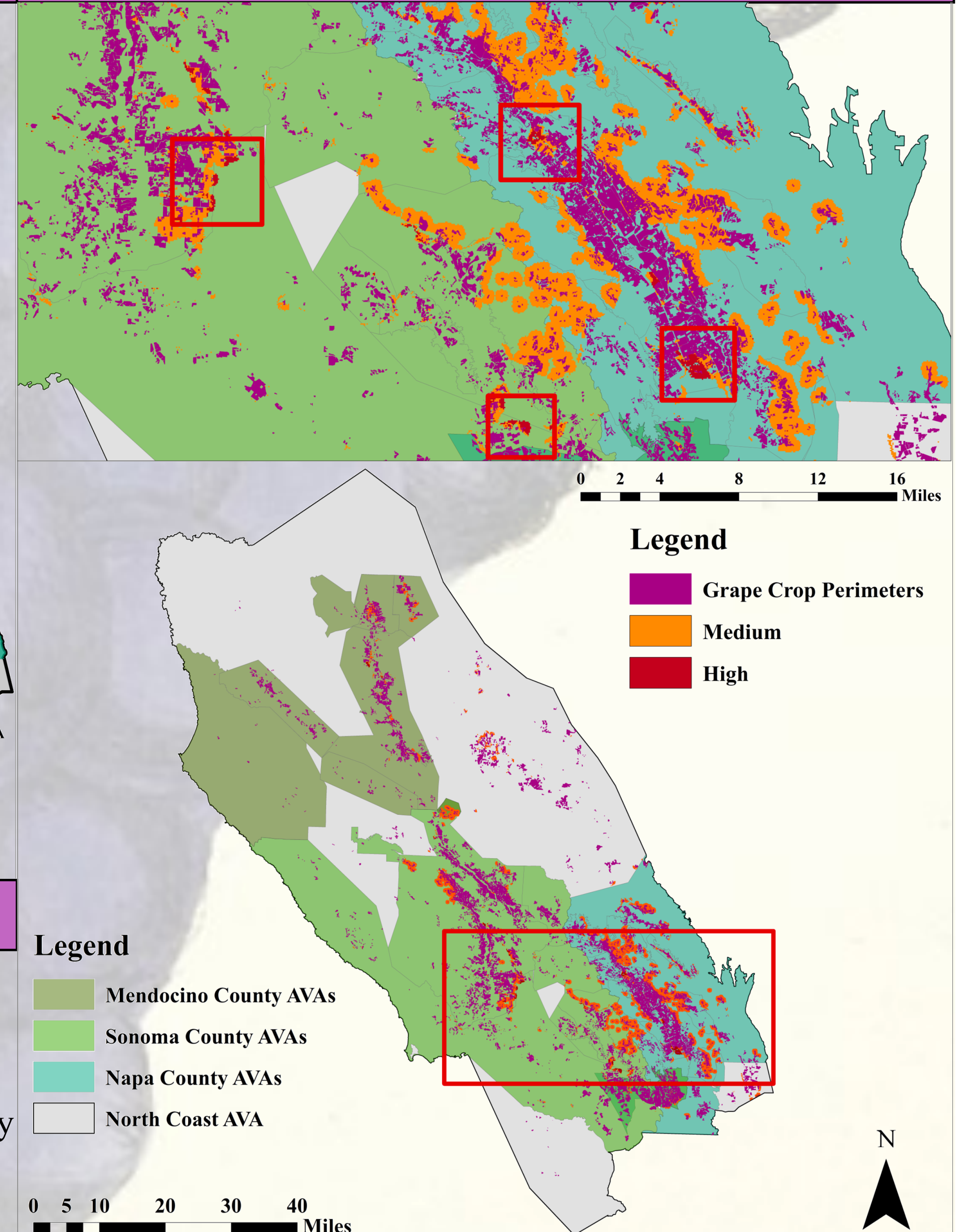
At Risk Areas: Fire Threat + WUI



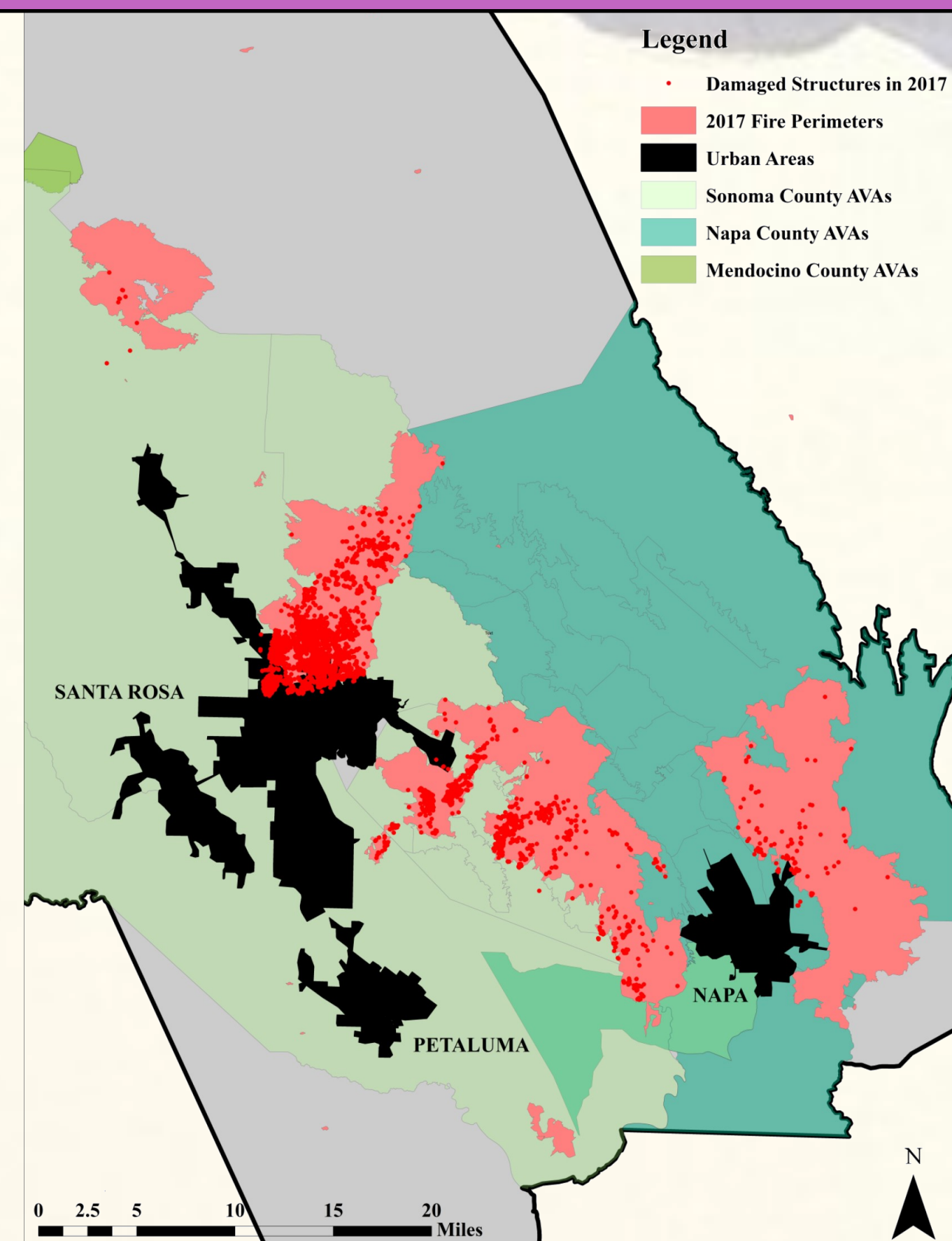
Grape Crop Perimeters



Areas of High Fire Risk in Grape Crop Perimeters



2017 Fire Perimeters and Damaged Structures

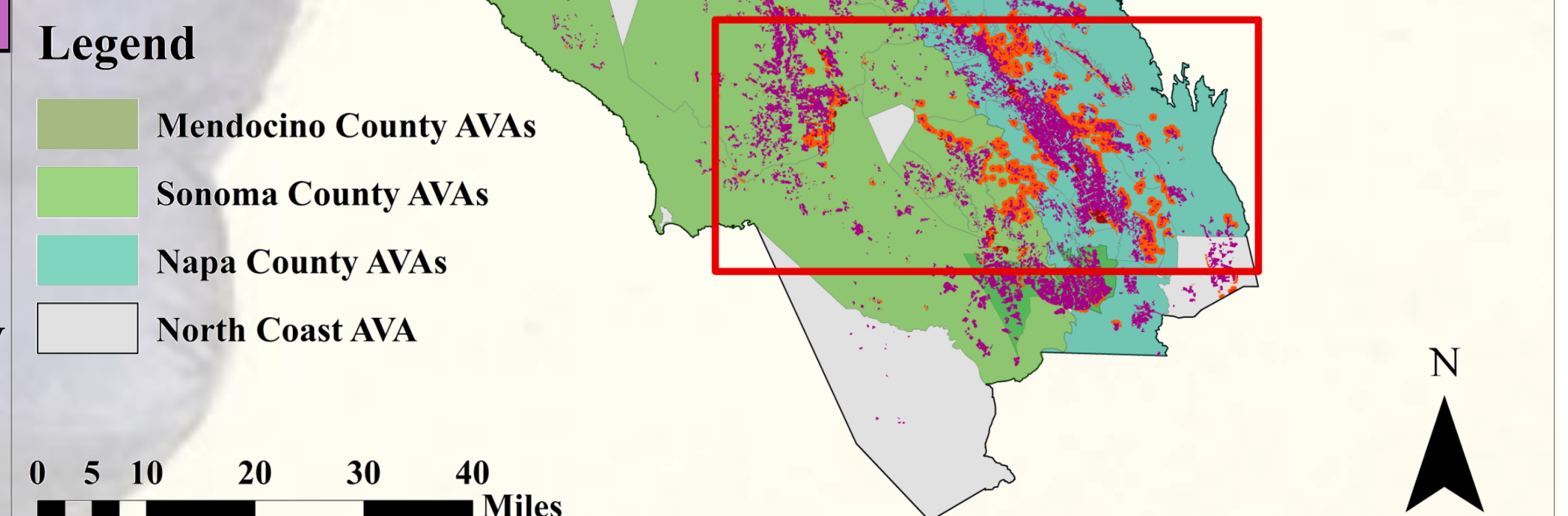


Discussion

The fires from 2017 had a huge negative impact on wineries in the area. Many buildings were either partially or completely destroyed within the fire perimeters, a good portion of them agriculturally related. There are some key grape crop perimeters within high risk zones, particularly in the Napa AVAs as well as at the boundary between Napa and Sonoma counties. These are the areas that will need fire mitigation plans specifically for grape crops, which could include land cover buffers or relocation of grape vines. The 2018 Strategic Fire Plan for California confirmed the growing concern that large fires (>1000 acres) are becoming more frequent and are growing in size. Going forward, growth patterns of cropland and urban areas must keep the possibility of significant fires in mind.



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Cartographer: Liz Kellam
Class: UEP 232 Intro to GIS, Fall 2018
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Projection: NAD 1983 California Teale Albers
GCS North American 1983

Data:
CAL FIRE : The CA Department of Forestry and Fire Protection
State of California Geoportal
CA Department of Water Resources
Napa County GIS Open Data Portal

Dunham, John & Associates. *Economic Impact Report on Wine*
Geissler, Daniel and William Horwath. June, 2016. *Grapevine Production in CA*
The Wine Institute. n.d. *Lifestyle Release: Fascinating Facts about CA Wine*