California Fire Incidents

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Introduction

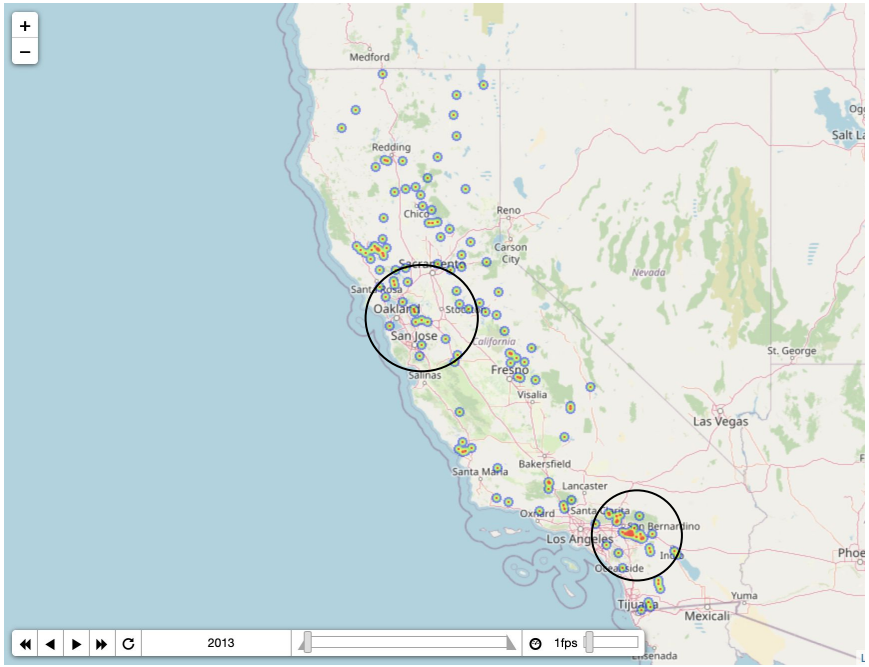
- Are the fires changing? If so, how?
  - Are the number of fires increasing?
  - Are the fires getting bigger?
  - Do people think fires are becoming a major problem?

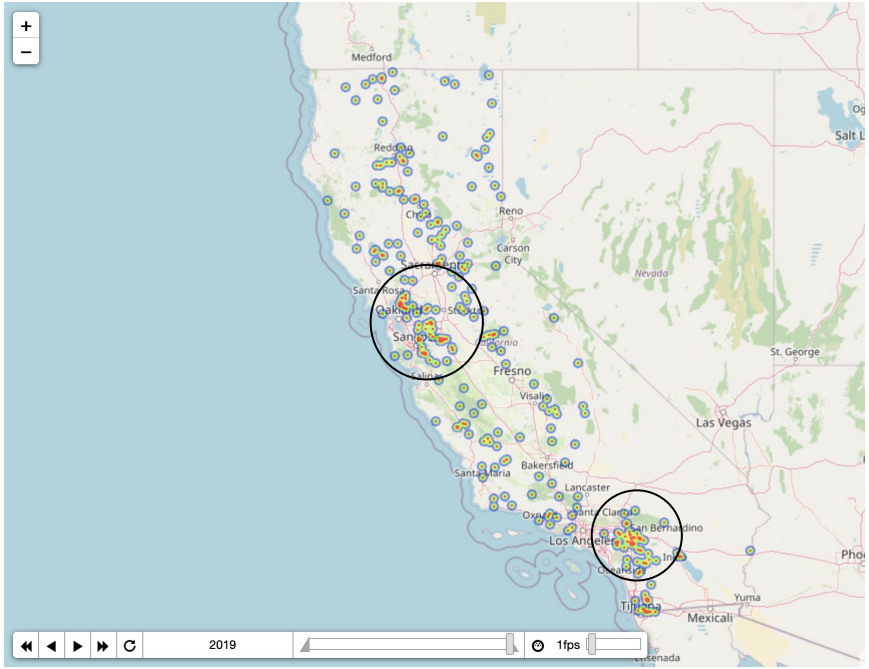
Data

- California WildFire Incidents (2013-2019)
- Kaggle
- Started with 1,636 observations and 40 attributes
- Ended with 1,410 observations and 10 attributes

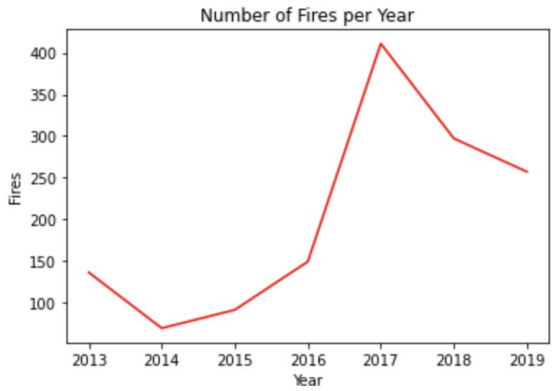
UniqueID	Name	Counties	StartYear	StartMonth	StartDate	AcresBurned	Latitude	Longitude	MajorIncident
00089805-cdee-4607-8b67-1653bee463bc	Gulch Fire	Modoc	2014	7	2014-07-03	1469.0	41.489	-120.904	True

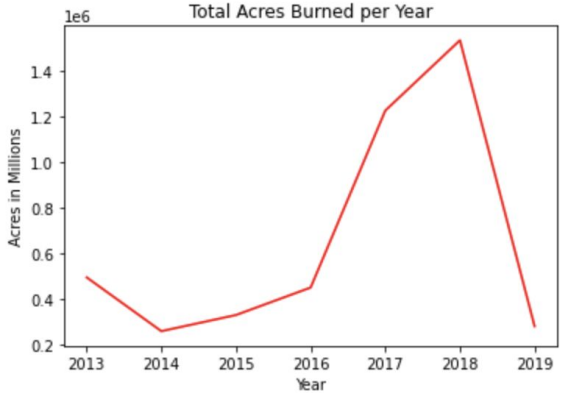
EDA: Time Lapse Map

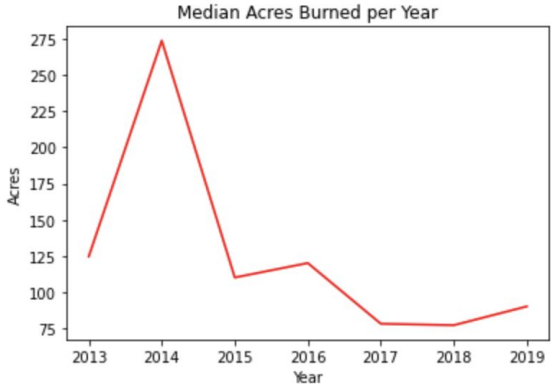


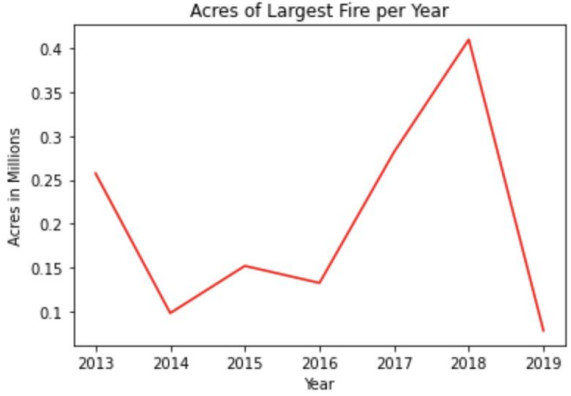


EDA: Nature of the Fires by Year

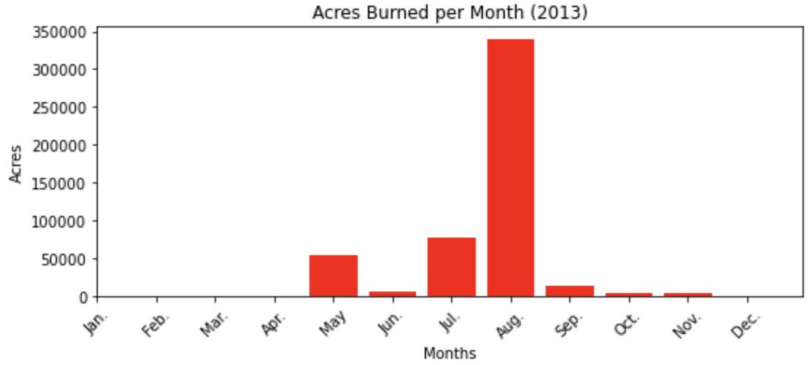


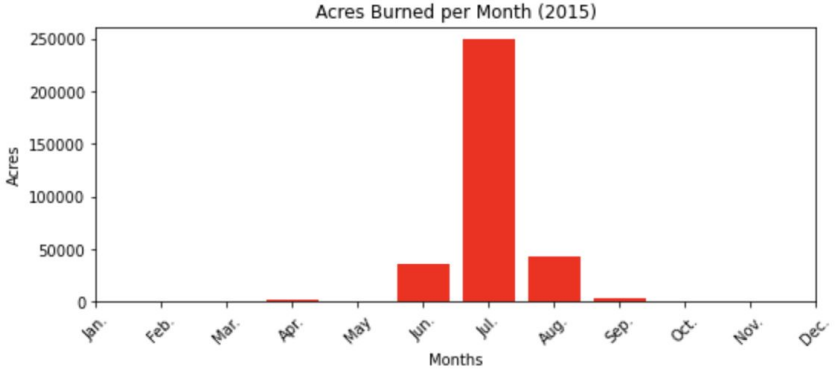


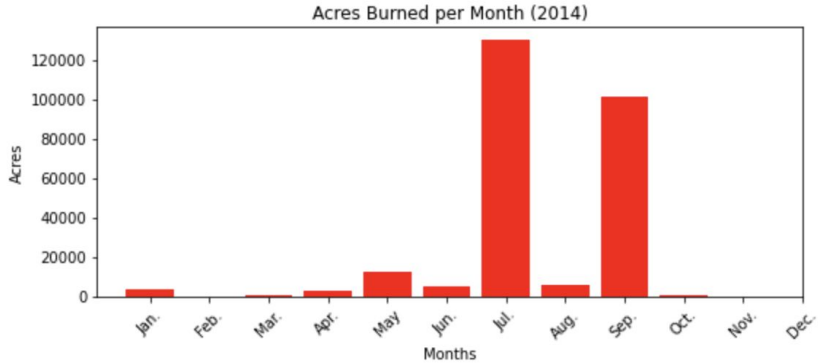


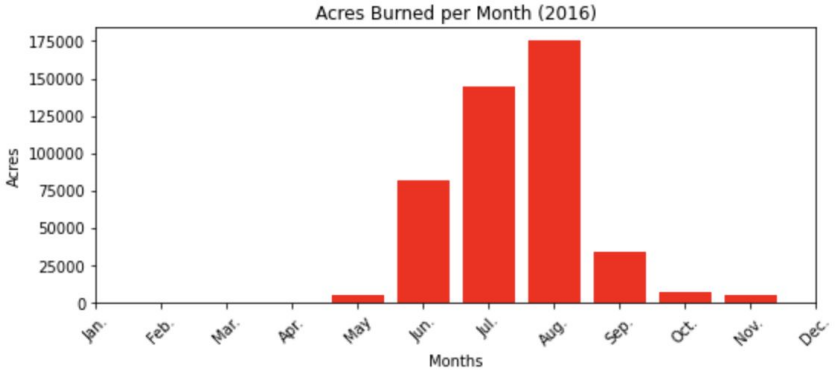


EDA: Acres Burned per Month by Year

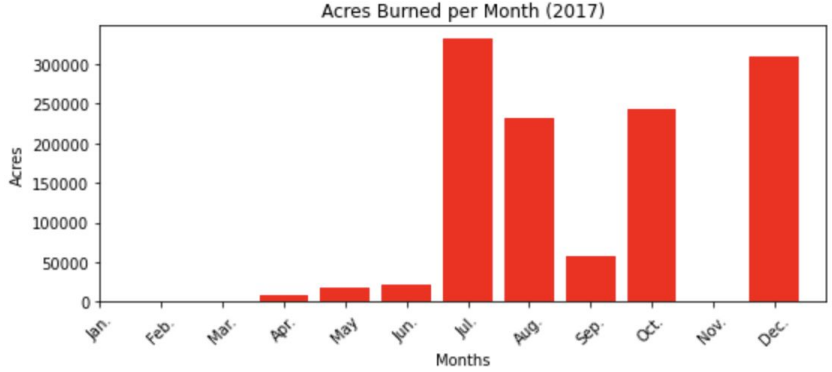


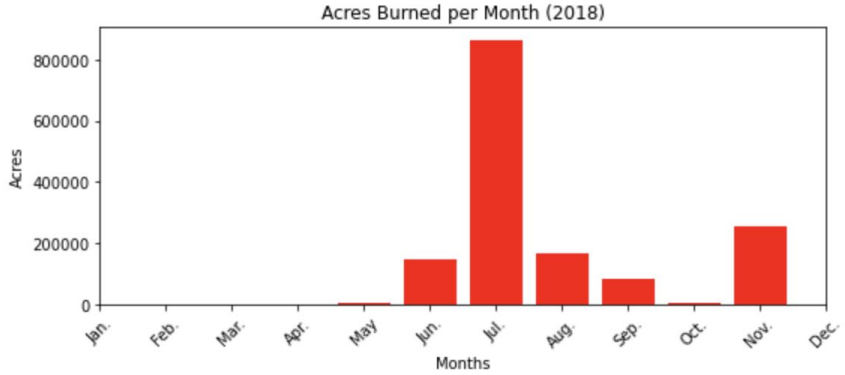


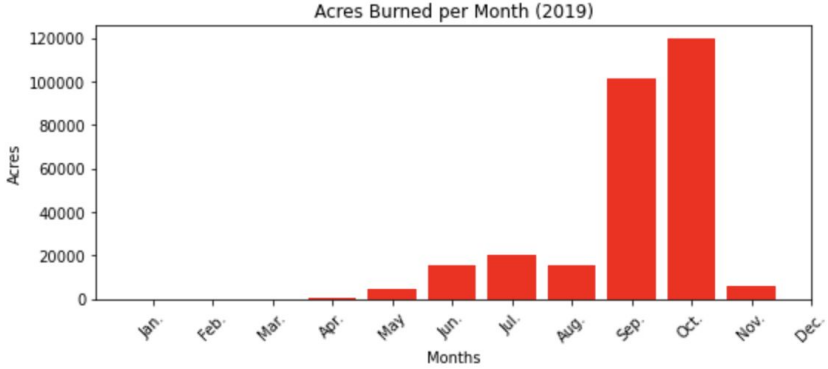




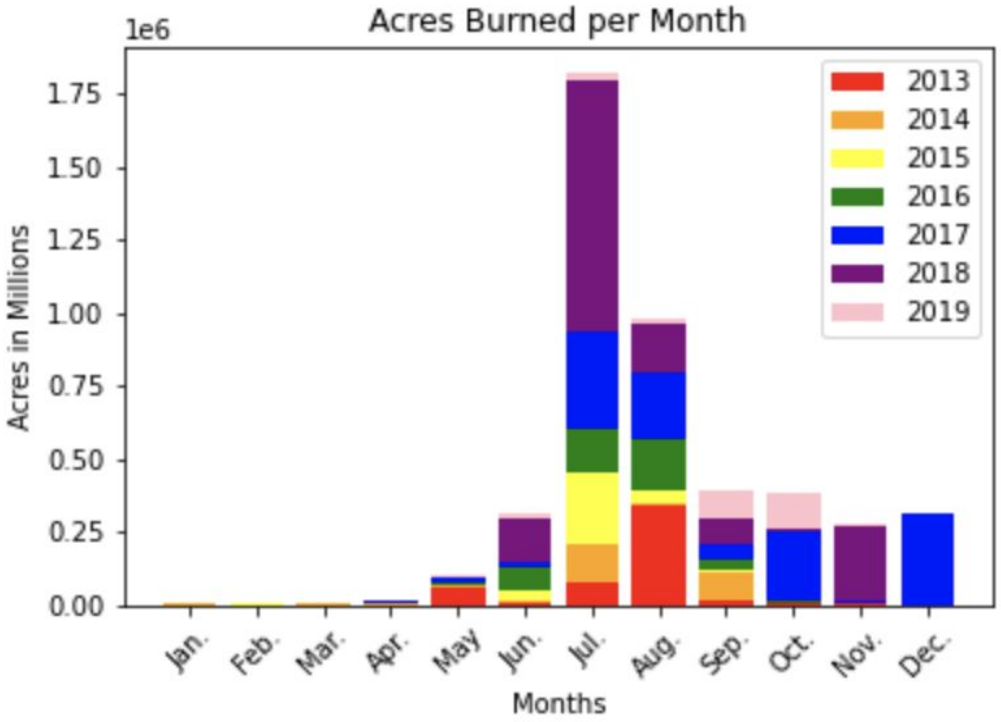
EDA: Acres Burned per Month by Year (cont.)







EDA: Proportions by Year

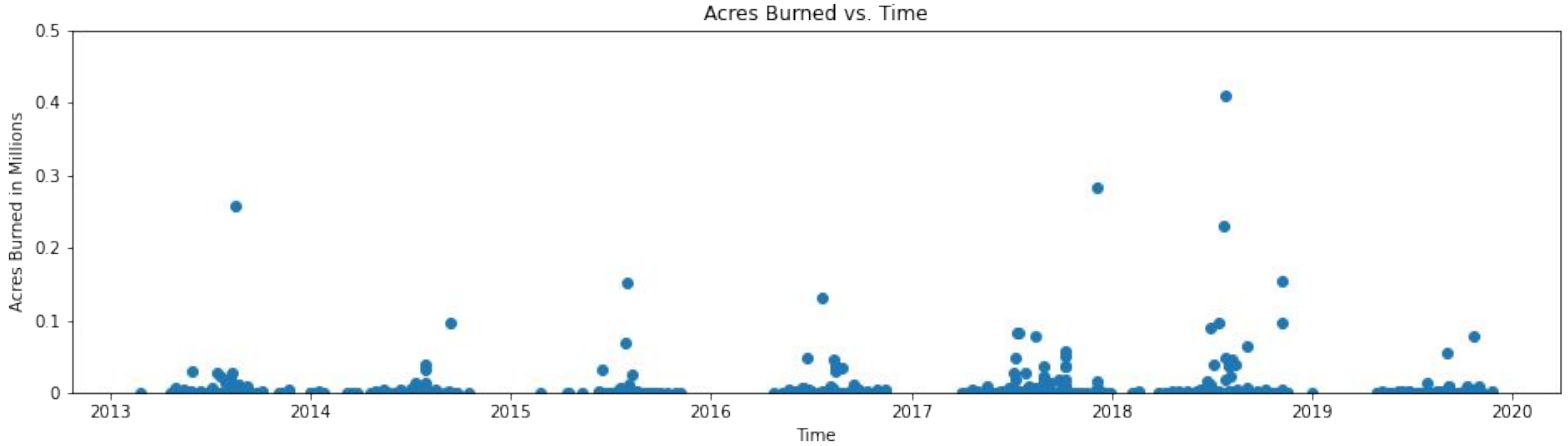


Hypothesis Testing: Pearson Correlation Test

- Null Hypothesis
  - There is no trend for the number of acres burned by the California Fires over the years 2013-2019.
- Alternative Hypothesis
  - The number of acres burned by the California Fires has been increasing over the years.
- Level of Significance: 0.05 or 5%

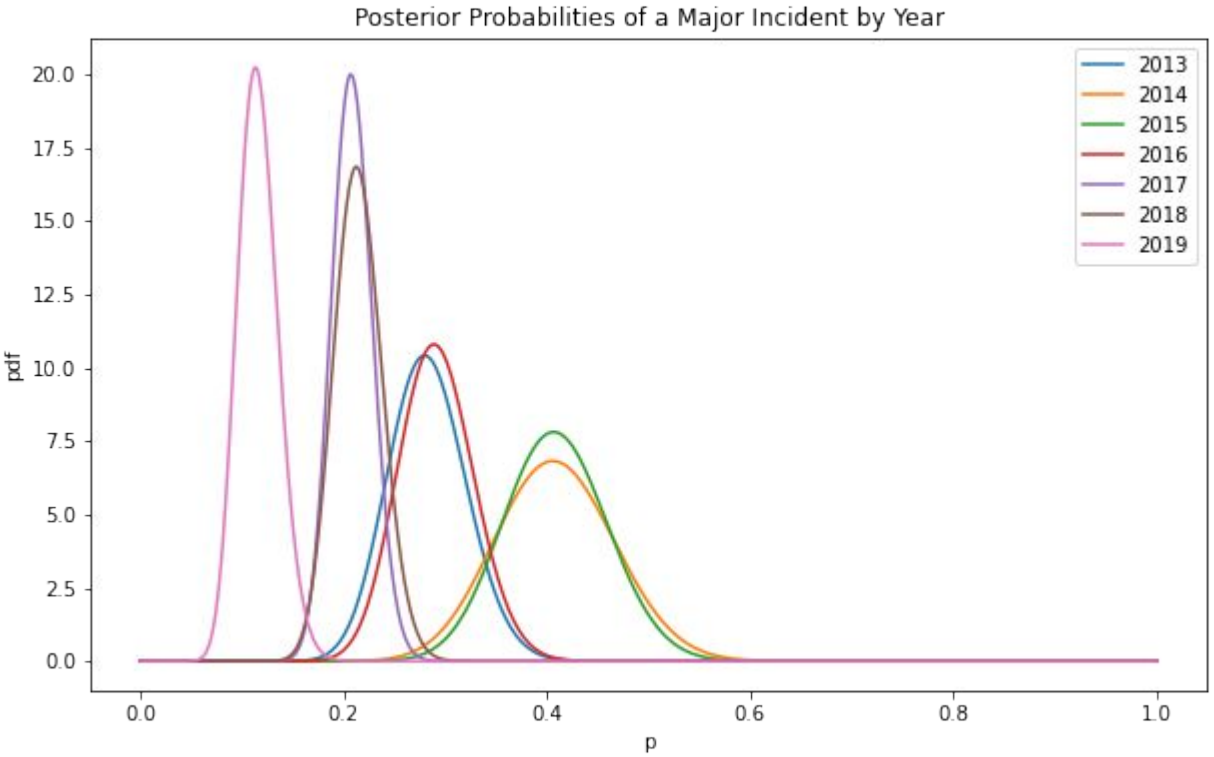
P-Value	0.6373 > 0.05	Fail to Reject the Null Hypothesis
Correlation Coefficient	-0.0126	Little to No Correlation

Correlation Between Time and Acres Burned



Hypothesis Testing: Bayesian Test

- What's the probability that the proportion of a fire being a major incident increases from 2013?
- 0% for 2013 to 2019
- 6% for 2013 to 2018
- Not Likely



Conclusion

- There are definitely more fires now then there were in 2013.
- The fires are shifting from spring/summer time to summer/fall time.
- However, the data fails to show a positive correlation between time and the size of the fires.
- People do not believe fires are as much of a major incident as they did in 2013.
- Further Testing
  - Increase the time period
  - Test for a relationship with temperature

Sources:

- For access to this project: https://github.com/kaciewebster/ca-fire-incidents
- https://towardsdatascience.com/data-101s-spatial-visualizations-and-analysis-in-python-with-folium-39730da2adf
- https://www.sciencemag.org/news/2020/03/us-wildfires-plummeted-2019
- https://wildfiretoday.com/2015/11/09/was-the-2014-wildfire-season-in-california-affected-by-climate-change/
- https://www.fs.usda.gov/treesearch/pubs/58973

Any Questions?