
Aggieland DataDunkers



ADD Final Presentation

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Problem Statement and Project Scope

- Three Main Questions
 - Where do wildfires occur?
 - Location, Causes, Fire Size, Number of fires and acres burned
 - What populations are affected by wildfires?
 - Demographics Analysis
 - What are the economic costs of wildfires?
 - Economic Analysis
- Scope
 - Limited to United States
 - Time Analysis max of 20 years



Datasets

- Competition Datasets
 - National Interagency Fire Center (NIFC)
 - Lots of Fire Statistics
 - Fire Information Resource Management Systems(FIRMS)
 - Satellite data, latitude and longitude
- Additional Datasets
 - US census bureau
 - American community survey
 - Headwaters Economics
 - Kaggle Dataset (2.3 million wildfires across 20 years)
 - <https://www.kaggle.com/datasets/behroozsohrabi/us-wildfire-records-6th-edition?select=data.csv>

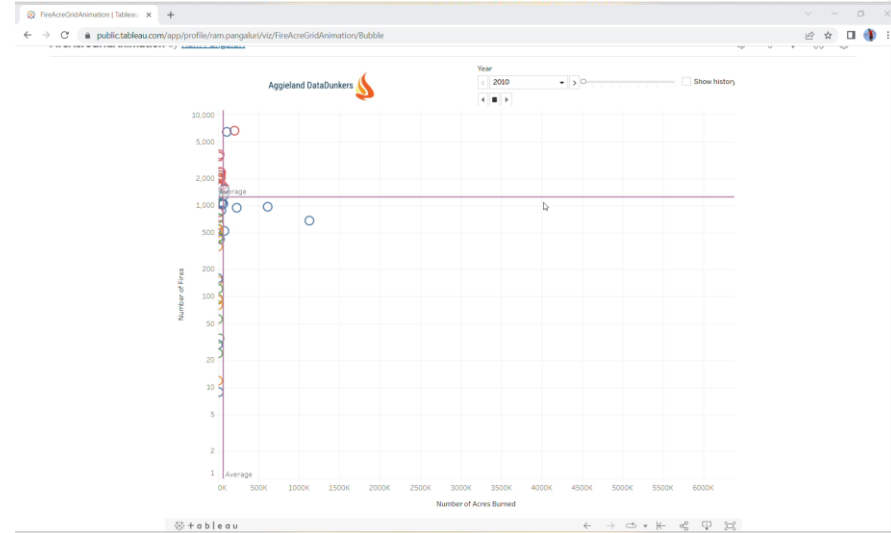
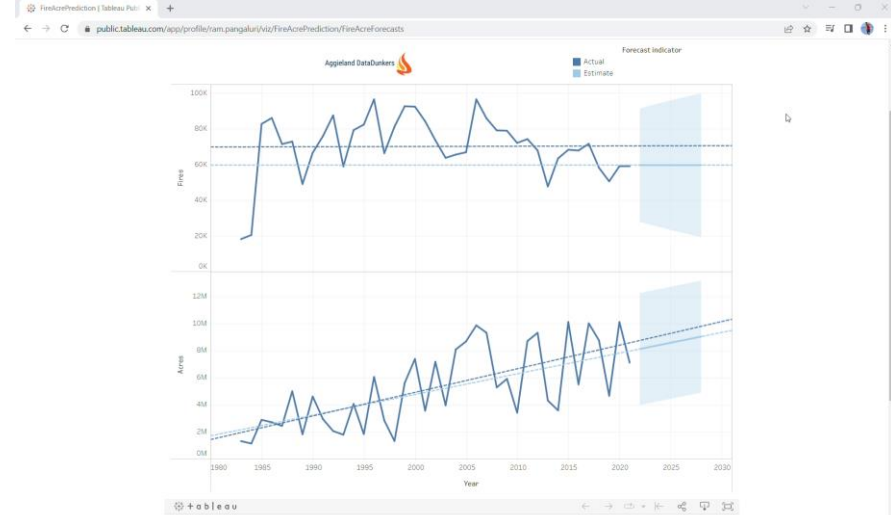


Where do wildfires occur?

- 1 Linear Regression Model
 - Acres Burned vs Time
 - Number of Fires vs Time
- 1 Pattern Recognition

Animation

- Relationship between Number of Fires and Acres Burned By State
- 4 visualizations
 - Different Levels of detail
 - National
 - State
 - County
 - Locations, Causes, Fire Size



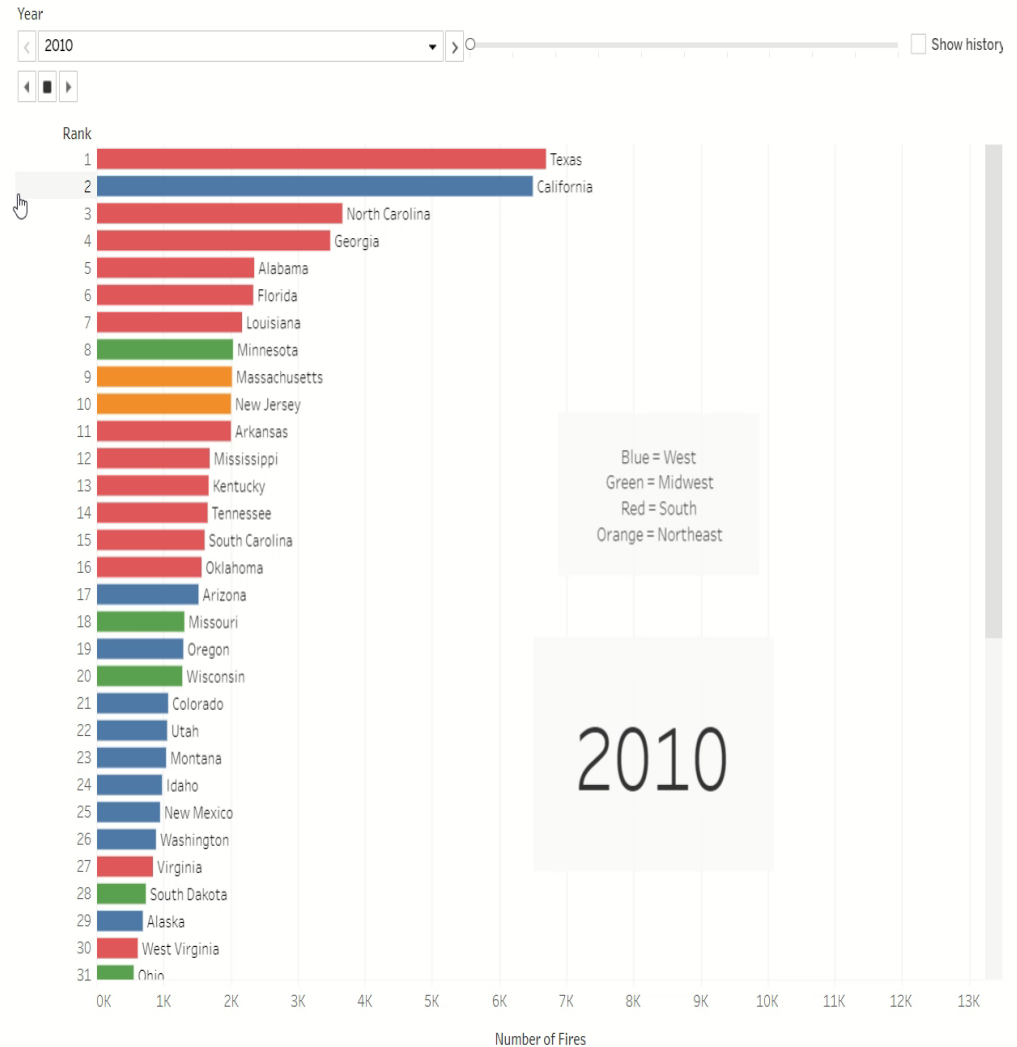
Pattern Recognition Animation Key Takeaways

- Grid below can be a useful tool for fire departments to compare their performance with other states. Also see relative risk and spot outliers in state fire activity.

High Fires, Low Acres Burnt	High Fires, High Acres Burnt
Low Fires, Low Acres Burnt	Low Fires, High Acres Burnt

Other Visualizations

- Key Takeaways
 - South and West Regions account for most number of fires
 - July 4th has a surprisingly large number of wildfires wonder why...
 - Different states have different fire seasons, due to different climates.



Fire by [Ram Pangaluri](#)

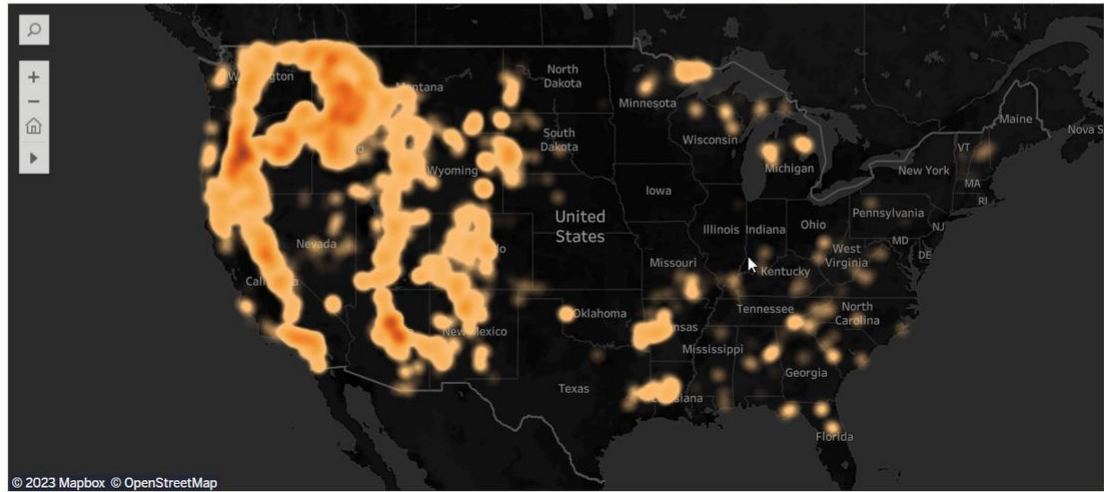


Year of Discovery Date

(All)

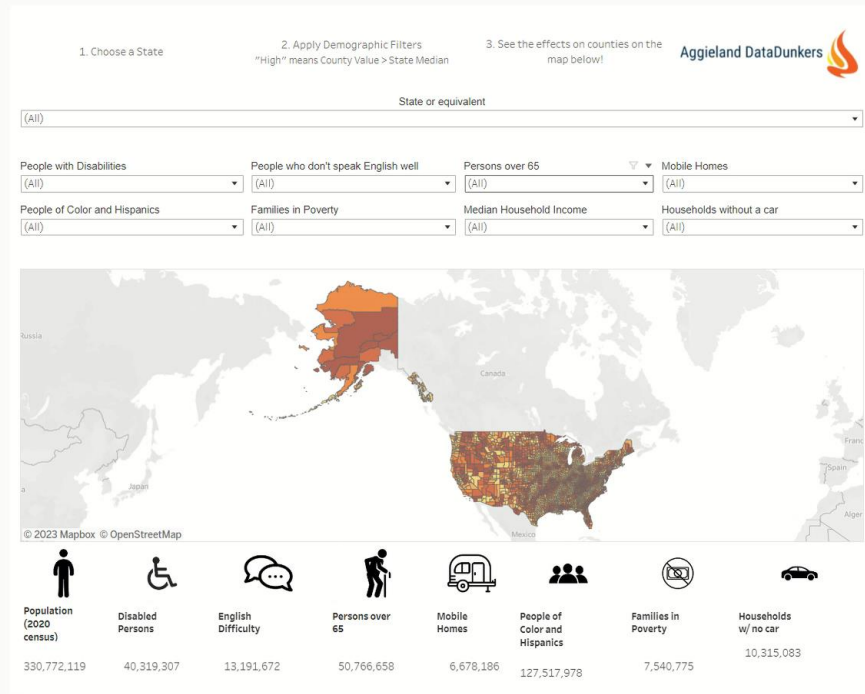
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10 years of USA forest fire data shows that most fires are less than a quarter of an acre, occur in the western part of the country, and are caused by lightning.



What populations are affected by Wildfires?

- 1 dashboard
- National and State population data
- Focusing on impact of wildfires on vulnerable populations
- Also comparing wildfire risk of counties within a state against each other
- Key Takeaways
 - Fires impact vulnerable communities harder than average
 - Intensity of impact depends on state
 - Vulnerable populations aren't distributed evenly across states or counties.



What are the economic costs of Wildfires?

- 1 dashboard
- Cost per fire and Overall firefighting costs relationship over time.
 - National Level
- Percentage of wildfire exposed housing units
 - Were or within radius/range of a wildfire
 - County Level
- Value at Risk
 - Total property value that was or is within radius/range of a wildfire
 - Assuming 100% damage to structure
- Key Takeaways
 - South and West Regions have more exposed housing units than Northeast and Midwest
 - California has tremendous amount of property value at risk of wildfire damage - high property values.
 - Cost per fire and total firefighting costs are generally increasing year over year



Tools Used

- Tableau - graphics, animations, visualizations
- Excel - data cleaning, formatting, formulas
- R - plots, html pages
- Github - collaboration, version control
 - <https://github.com/rampang/AggielandDataDunkers2023>



Thank you!

Questions?

