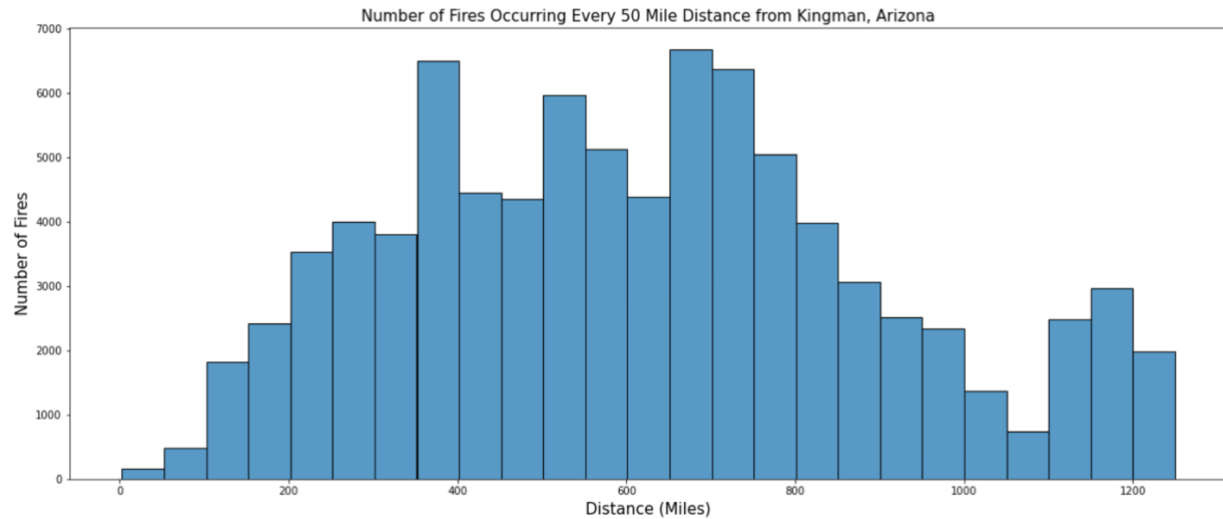


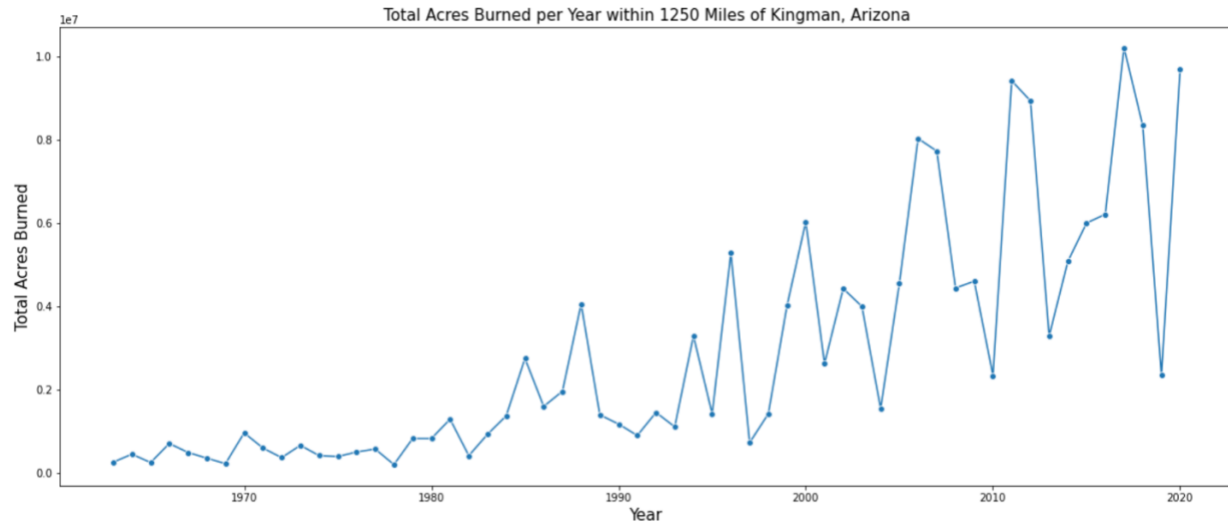
Common Analysis Reflection

Figures and Extended Captions



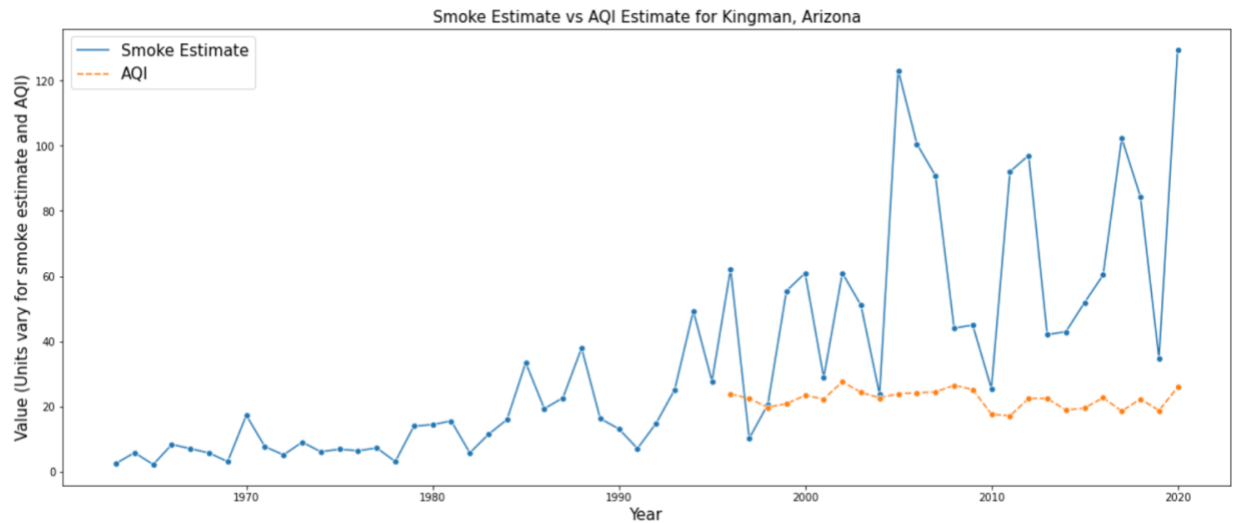
The visual shown above is a histogram displaying the number of fires that occurred within 1250 miles of Kingman, Arizona, bucketed in 50 mile increments based on each fire's shortest perimeter distance from Kingman, Arizona. These fires occurred from 1963 through 2020. The viewer can read this figure as the distribution of fires based on distance from Kingman, Arizona. For example, the tallest bar is in the 650-700 range. Looking at this section, this tells us that from 1963 through 2020, there were almost 7,000 fires that occurred between 650 and 700 miles away from Kingman, Arizona. This visual gives an informative glimpse into what distances fires most often occurred at near Kingman, Arizona.

The x-axis represents distance in miles that the closest point of each fire was from Kingman, Arizona. The y-axis represents the total number of fires from 1963 to 2020 that fit into each distance bucket. The underlying data is individual fire records from 1963-2020 for any fire that occurred within 1250 miles from Kingman Arizona. No major processing of the data was required to create this visual. We simply had to filter to fires within 1250 miles of Kingman, Arizona and filter to only fires that occurred from 1963 through 2020.



The figure above is a time series that shows the total acres burned by fires within 1250 miles of Kingman, Arizona from 1963 through 2020. The points represent individual total acres burned counts for each year, and the lines simply connect the points in the shortest possible path sequentially. This helps show the change in total acres burned over time. The viewer can read the visual as a trend over time of total acres burned by fires within 1250 miles of Kingman, Arizona from 1963 through 2020. Each point represents the number of total acres burned by fires for its respective year. Overall, we see an upward trend over time of total acres burned by fires from 1963 through 2020.

The x-axis is the year. This simply represents the year in which each fire occurred. The y-axis is the total acres burned by fires within 1250 miles of Kingman, Arizona from 1963 through 2020. This, in combination with the x-axis, allows us to investigate the total acres burned by fires for each year and the overall trend of this statistic. The underlying data is individual fire records from 1963 through 2020 for fires within 1250 miles of Kingman, Arizona. This was then grouped by year, and the acres burned by each fire were summed over each year, giving us total acres burned by year.



The visualization above is a time series showing our smoke estimate and the US EPA’s air quality index estimate over time for Kingman, Arizona. The viewer can read the figure in a similar manner as we did for the previous visualization. The figure represents the trend over time in our smoke estimate compared to the US EPA’s AQI estimate. Each point is an individual measurement for its respective metric, with lines connecting points sequentially to provide an idea of trend. We can see that our smoke estimate generally increases over time from 1963 through 2020. However, the AQI estimate stays generally flat from 1996 through 2020. It’s important to note that we’re looking at trends rather than magnitudes in this graph because the units vary between the two metrics.

The x-axis represents the year. This is simply the year that each metric pertains to. The y-axis represents that value of the smoke estimate and AQI estimate. Unfortunately, these two metrics have different units, so this is not shown on the axis. However, the value of assessing similarities in trends does not rely on units aligning. The underlying data for smoke estimates comes from individual fire records. The calculation involved dividing their acres burned by distance from Kingman, Arizona, summing this value for all fires in a year, and dividing this by 184 (number of days in fire season). The AQI estimates came by pulling daily reports on AQI measurements from Mohave County (location of Kingman) and averaging these for each year.

Collaborative Activities

The process of answering the research question posed in this assignment, in conjunction with the ability to collaborate with others, taught me many things throughout my work.

Collaboration significantly helped and changed my thinking about the problem at multiple points throughout the assignment. I did not use any code from my classmates, other than the code provided by Dr. McDonald. However, I did bounce ideas off my classmates and check in with them as I went. First, I learned that my classmates are great for making sure that I'm on the right track. This was especially helpful during the acquiring data step. For both the fire data and the EPA air quality index data, I made sure to confirm with classmates that my data was looking generally similar to theirs. This involved checking that they had 130k rows in their fire data once converted, ensuring we had similar features, confirming how far back the fire data went, comparing how far back our AQI data went, etc. This was helpful because my classmates acted as a source of confirmation. By confirming important details with them, I knew at each major step that I was at least on the generally correct track. In addition, there were times when my data didn't match, which either helped me fix mine or assist in helping my classmates fix theirs.

I also learned that classmates are generally great for brainstorming ideas towards a solution with. This was especially prominent in creating a smoke estimate. I heard so many different ideas thrown out for smoke estimate possibilities; my smoke estimate ended up being a culmination of many thoughts that I heard from various voices throughout the class. In addition, my classmates were great in bouncing ideas off of for how to create the predictive model for smoke estimates. I heard people using various forms of linear regression and time series. This allowed me to investigate both routes and choose the one that I felt was best suited for the problem. Lastly, my classmates were helpful in providing ideas for the visualizations. This included how to process the data for the visualizations and what aesthetic touches to add to increase interpretability.