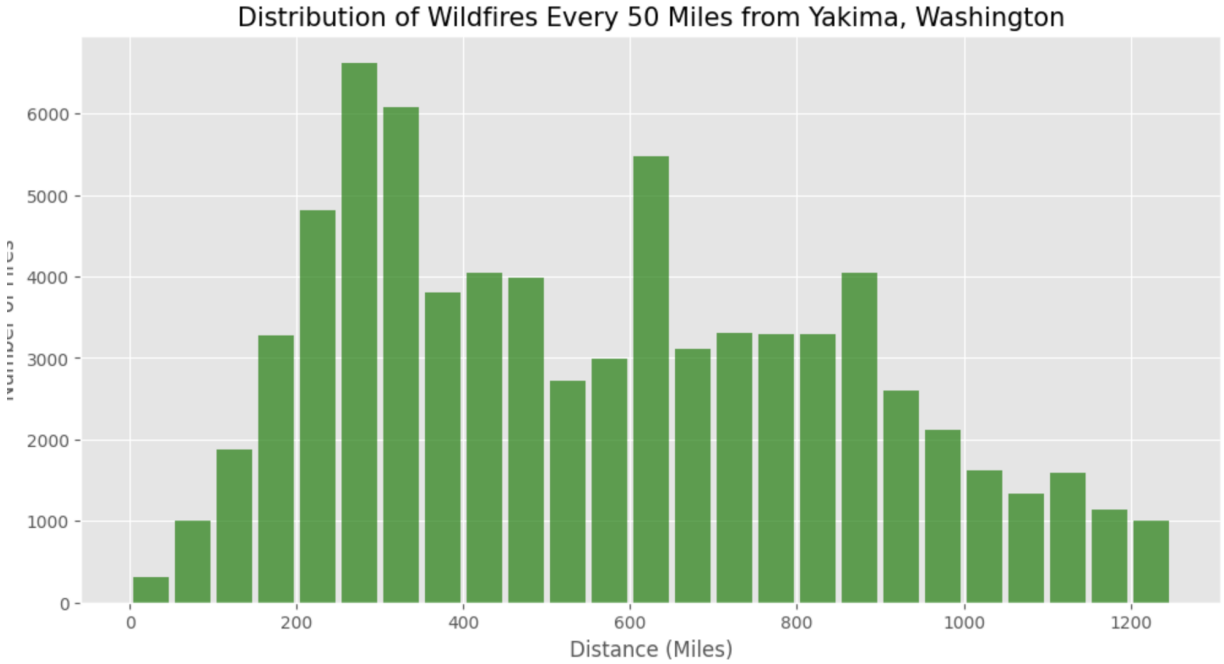
Visualization Explanation

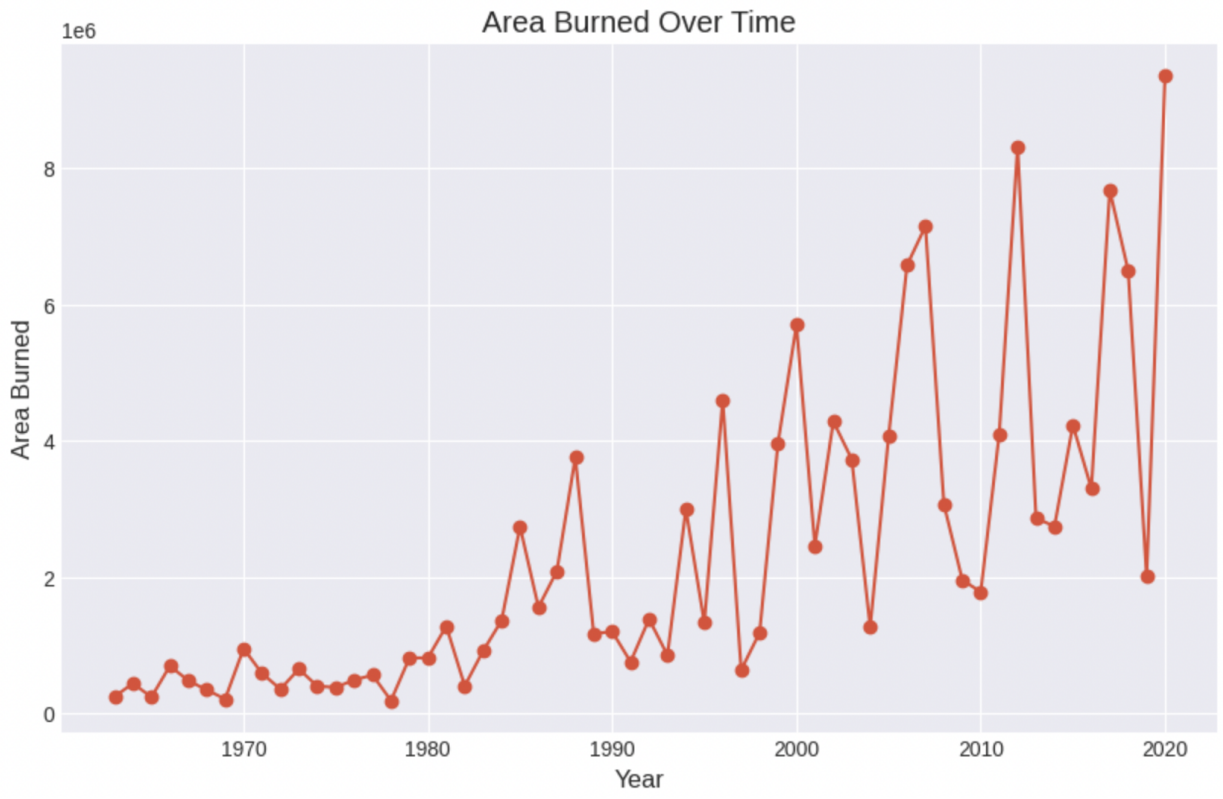
Graph 1: Produce a histogram showing the number of fires occurring every 50 mile distance from your assigned city up to the max specified distance.



The histogram displays the frequency of wildfire occurrences in 50-mile increments from Yakima, Washington, based on data that likely includes fire dates, distances from the city, smoke estimates, areas burned, fire types, and other parameters. The x-axis details the distance in miles, while the y-axis indicates the number of fires. The chart reveals a widespread distribution of fires, with a higher frequency of fires occurring further from Yakima. The peak of fire occurrences falls between distances of 400 to 450 miles, indicating that the immediate vicinity of Yakima has fewer fires. This visual suggests that Yakima may not be a major center for wildfires, as the number of fires decreases closer to the city.

Graph 2: Produce a time series graph of total acres burned per year for the fires occurring in the specified distance from your city.

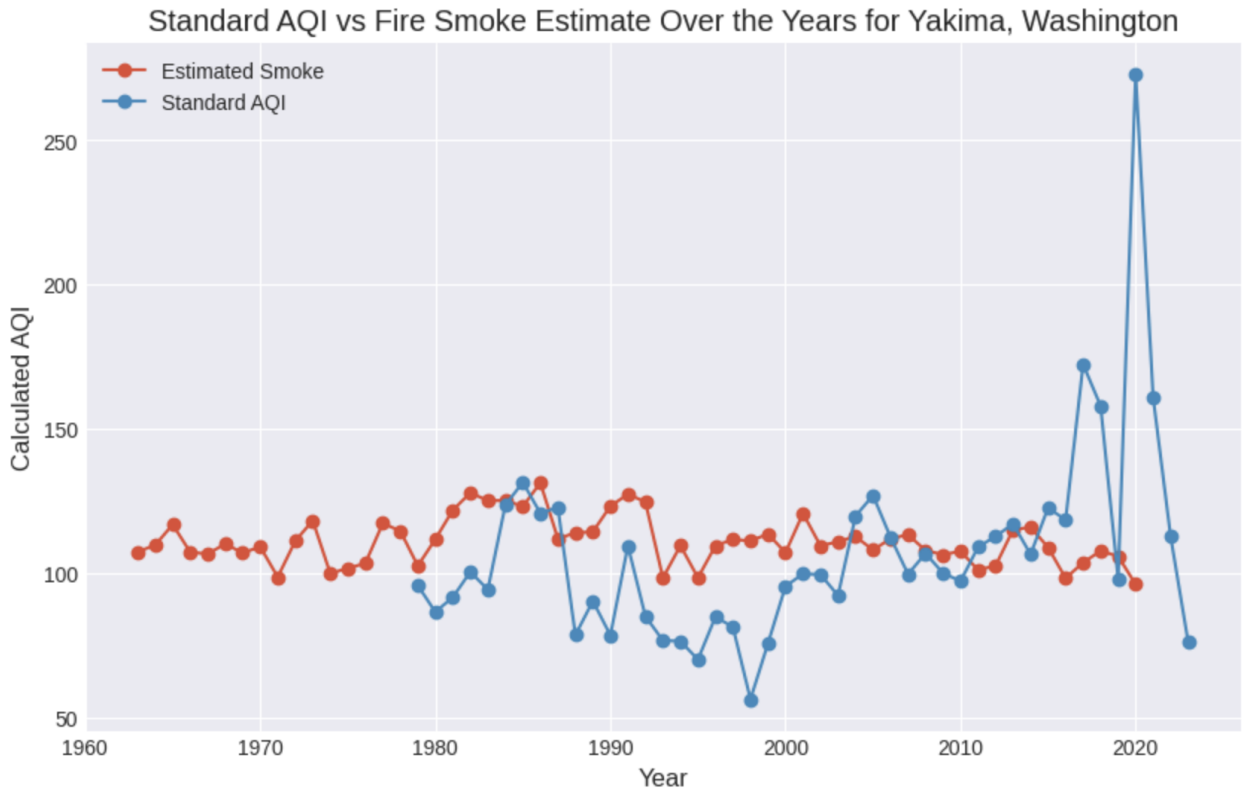
The time series graph shows the annual area burned by wildfires from the 1970s to the 2020s. It highlights a general increase in the extent of wildfires over time, with significant variability from year to year. The peaks indicate years with extensive wildfires, suggesting more severe fire seasons, while the valleys suggest less activity. The upward trend in recent decades may point to factors such as climate change influencing wildfire behavior.



GRAPH 3: Produce a time series graph containing your fire smoke estimate for your city and the AQI estimate for your city.

The graph compares the Standard Air Quality Index (AQI) to an estimate of smoke from fires over the years in Yakima, Washington. The red line represents the estimated smoke, and the blue line shows the standard AQI values.

From the 1960s to the late 2010s, both the estimated smoke and the standard AQI fluctuate, but they generally track closely together, suggesting that the presence of smoke from fires is a significant factor in the overall air quality of the area. However, from around 2015 onwards, there is a notable divergence where the peaks in estimated smoke dramatically exceed the standard AQI values, indicating episodes of intense fire activity with severe impacts on air quality. The largest spike in estimated smoke occurs just before 2020, reflecting an exceptionally severe fire season.



General Reflection

This project was a full cycle of data science work where I had to handle and process large datasets, perform calculations, and visualize data to discern trends in wildfires and air quality. I used a professor's tools to manage the sizable data files, which made it easier. I enjoyed developing a method to estimate smoke levels and tackling the challenge of incomplete data, which involved creative coding solutions. The visualizations I created showed an increasing trend in wildfire severity, which is concerning for forest sustainability. Collaborating with peers was beneficial, but we were careful not to simply copy each other's work to maintain integrity. The project was demanding, taking up most of a week, but I found it rewarding and am looking forward to future segments of the project.