

Final Research Poster by Tyree Gillespie-Williams

Introduction:

How do 4th of July fireworks impact the air quality of Toledo?

Every year in the US, there is a widespread celebration of our nation's birthday known as the 4th of July Celebration. During this holiday, setting off explosives known as fireworks is quite common. This raises the question of how much do these explosives impact our environment? Surely setting off gunpowder filled rockets can't be good for the air we breathe. Fireworks have been shown to generate huge amounts of pollutants in our atmosphere (Voiland, 2010). On top of that, 10 percent of the air humans breathe contain man-made aerosols (Zhang, 2019)

Hypothesis:

I believe that fireworks will cause emissions that negatively impact air quality.

Objective:

The objective of this project is to raise awareness of just how much fireworks impact the air of our community

Methods:

- Use airnow.gov archived data to collect daily AQI before, during and after July 4.
- This Data will then be plotted onto a line graph
- Identify spikes in AQI

Abstract:

One of an organism's most important necessities is to have a healthy and functioning respiratory system. With this being said, there are many hazards in the modern day that impact the air we breathe. Air pollution is no joke, and there are so many things that contribute to it, from car emissions, to factories, and even the sites where we burn our trash! This provoked an honest question, that being that what if one of America's most popular and widely celebrated holidays could be contributing to threats that our air faces. My hypothesis is that fireworks going off during the 4th of July will; negatively impact air quality

Results:

The AQI of Toledo fluctuated on a regular basis with June 30th, the 4th of July, and July 11th being the largest spikes in air quality. Something that I noticed looking at my data is that these spikes in AQI were also on days other than July 4th, that seem to imply that people may have celebrated the 4th of July before or after the actual holiday date which is pretty realistic. Because my recorded data was collected over the course of 21 days, (3 weeks) it is safe to assume that fireworks and 4th of July celebrations do in fact negatively affect the quality of the air we breathe

Conclusion:

In conclusion I was very curious about whether or not fireworks actually impacted air quality. Thanks to the data that I have collected, I believe that my hypothesis was proven correct that there are spikes in AQI around the time that the 4th of July is celebrated.

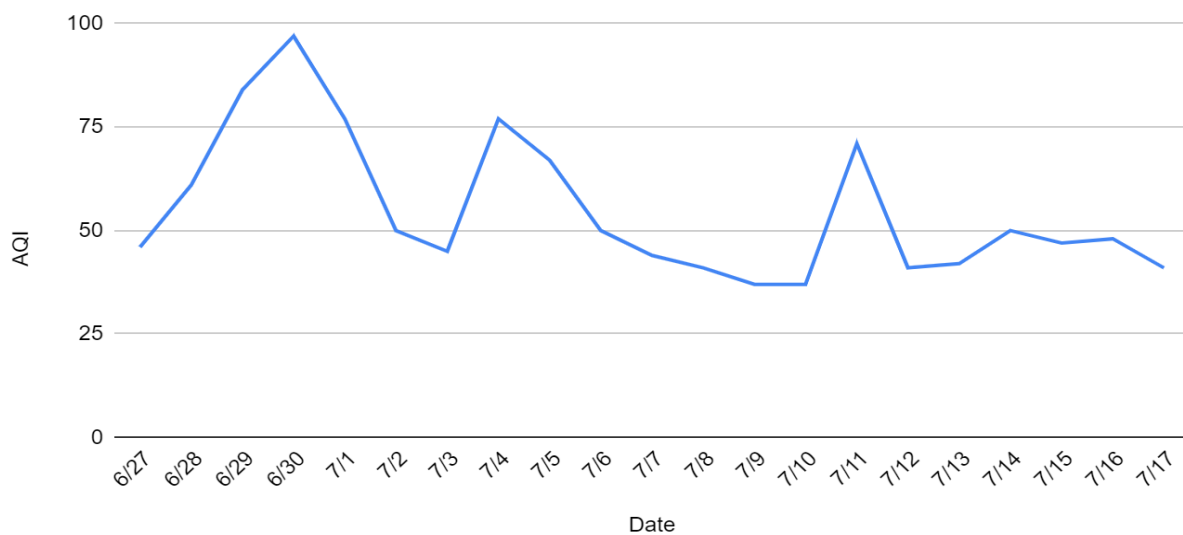
Acknowledgements:

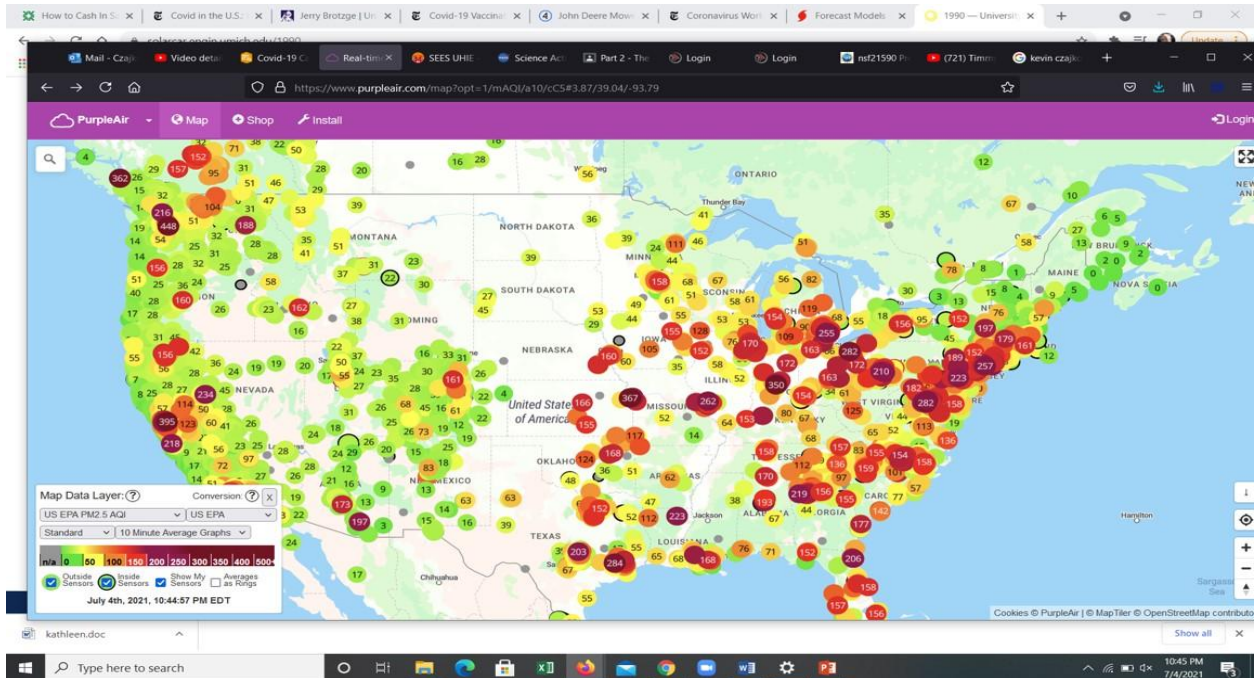
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Data:

AQI vs. Date





References:

<https://gispub.epa.gov/airnow/?monitors=ozonepm&xmin=-9360172.499244506&xmax=-9255759.518607097&ymin=5087137.2195572015&ymax=5124667.800445173&tab=archive>

<https://earthobservatory.nasa.gov/features/Aerosols>

<https://www.iqair.com/us/newsroom/are-fireworks-bad-for-air-quality>