

The Potential Impact of Wildfire Smoke on Crime in Cedar City, Utah

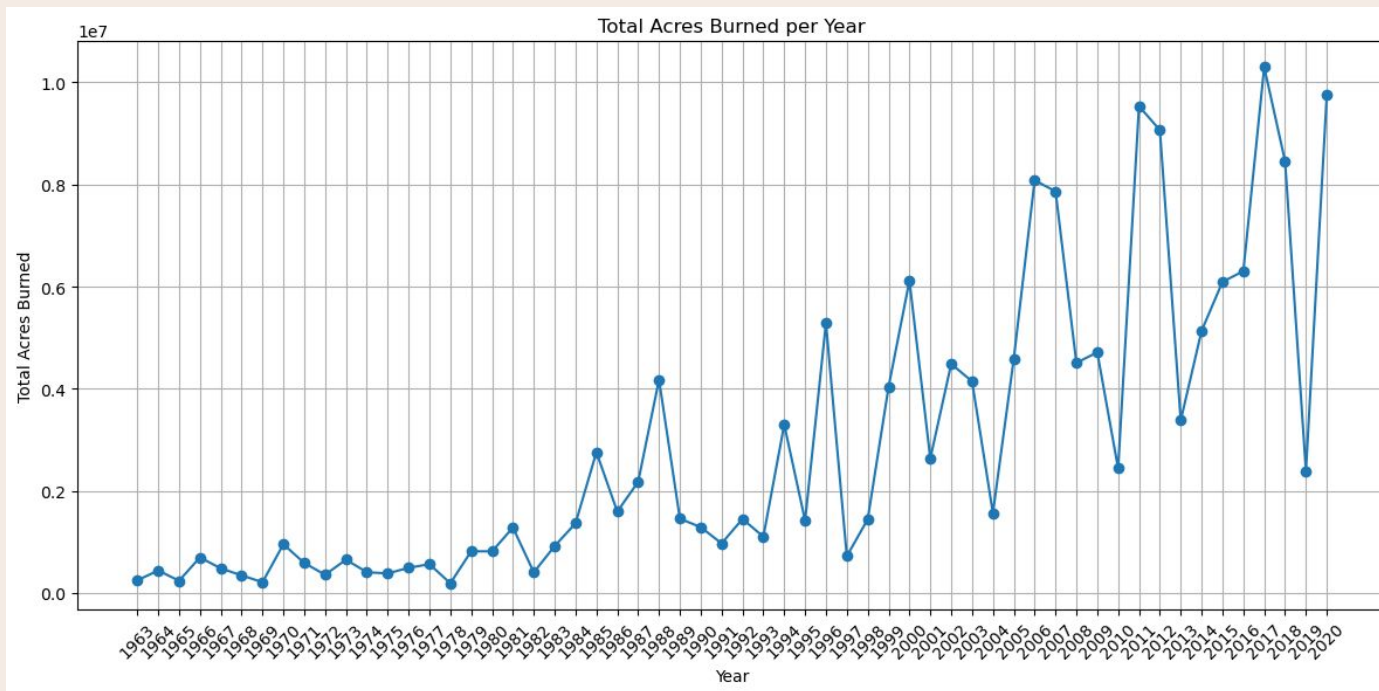
Presented by Jenny Wong



Population: 37.2k (2021)
Density: 1035 / mi²

Fire Observation in Cedar City, Utah

- There is an overall increasing trend in total acres burned per year due to wildfire



Research Question

"How does wildfire smoke affect the economic development and public health in Cedar City, Utah?"

- Focus of factor: Crime



Implications

- Public Health and Safety
- Policy Development for Crime Prevention
- Public Awareness and Education

Research Reference

- Focus of factor: Crime

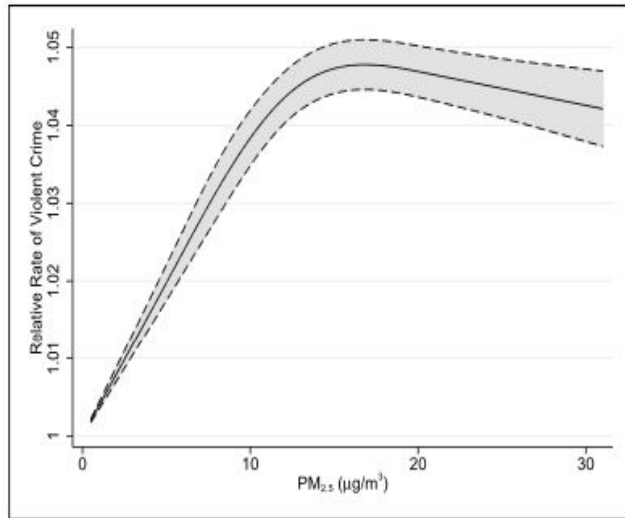


Fig. 2. PM_{2.5} dose response function for violent crimes relative to 0 µg³.

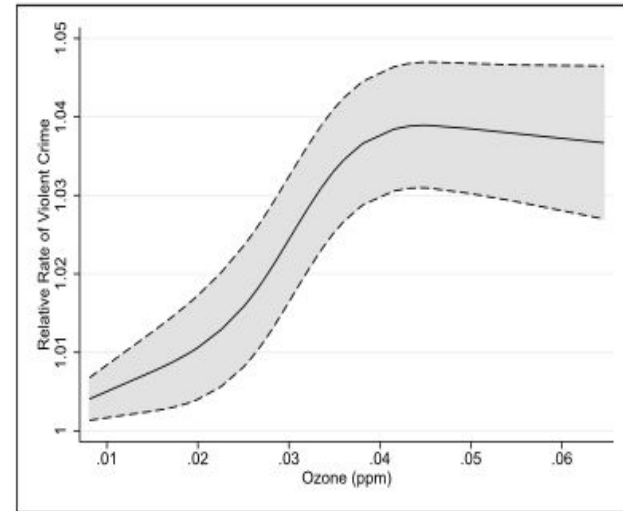


Fig. 3. Ozone dose response function for violent crimes relative to 0 ppm.

Methods



Data Sources

- Wildfire Data
- AQI Data
- Crime Data
- Population Data



Modeling Variables

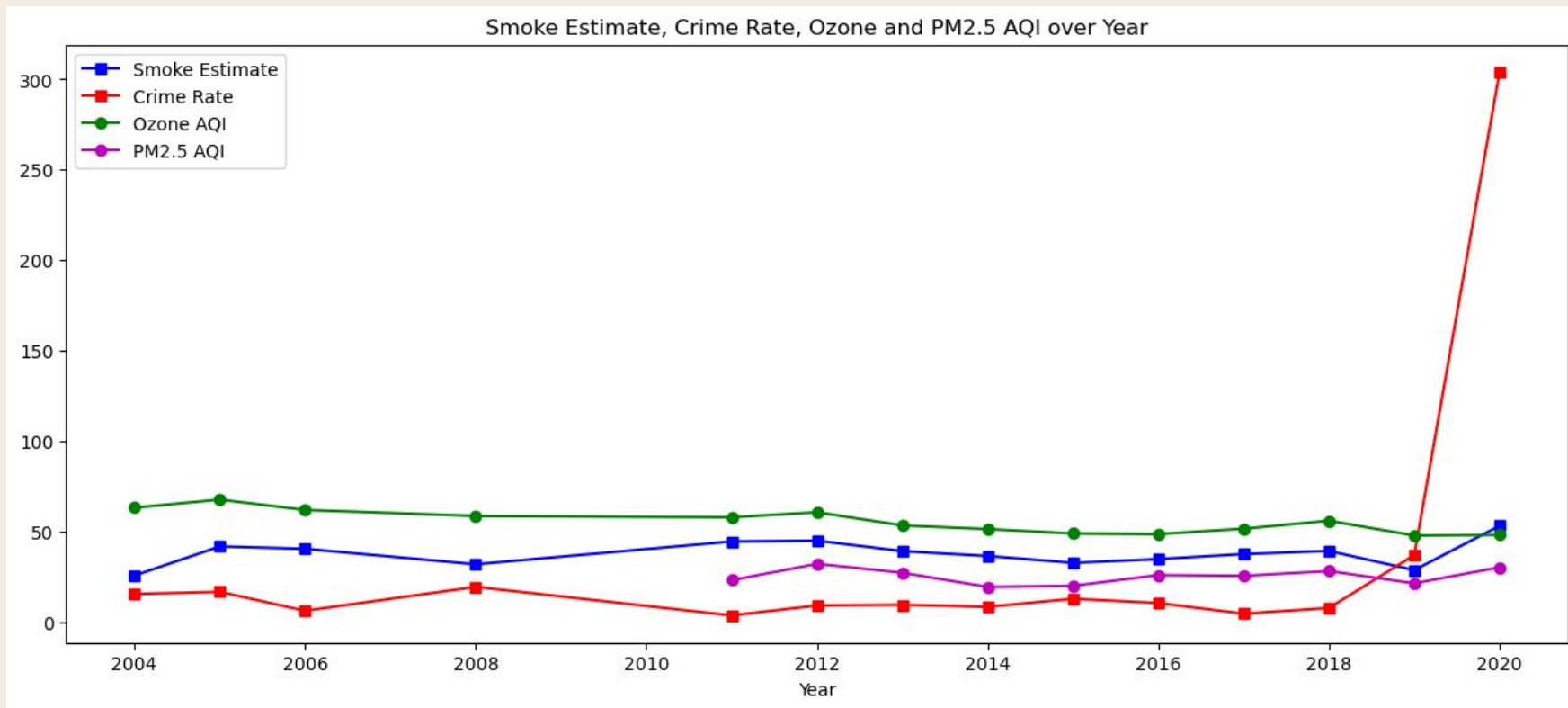
- Smoke Estimator
- AQI of Ozone and PM2.5
- Crime Rate



Use of Models

- Simple Linear Regression
- Random Forest

Smoke, AQI, and Crime over Year



Model Performance

Metrics	Simple Linear Regression	Random Forest
R ²	-18.01	-0.17
MSE	3.60e-05	0.0001



Limitations

Other Possible Factors

- Health and Mental Health
 - COVID-19
- Economic
 - Unemployment rate, Income inequality
- Drug and Alcohol Abuse



Limitations

Lack of Data Support

- Reference paper takes crime data for the entire United States
- While the data I used is only for a small city with lower population



Future Work

- Data Enrichment
 - Public Health
 - Employment
- Advanced Modeling Techniques
- Model Validation and Testing
- Explore Alternative Hypotheses