

Toxic Releases in Texas and their Burden on Communities

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A large, dark blue, diagonal shape that starts from the bottom left and extends towards the top right, covering the lower half of the slide.

Background



Environmental Justice

- “The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.” - EPA
- Flint, Michigan water crisis disproportionate lead poisoning of communities of color
- Toxic sites, treatment facilities, industrial plants commonly placed in marginalized communities

Objective

Do poorer neighborhoods or predominantly minority neighborhoods have more pounds of toxic releases compared to wealthier, white neighborhoods?

Sourced data from:

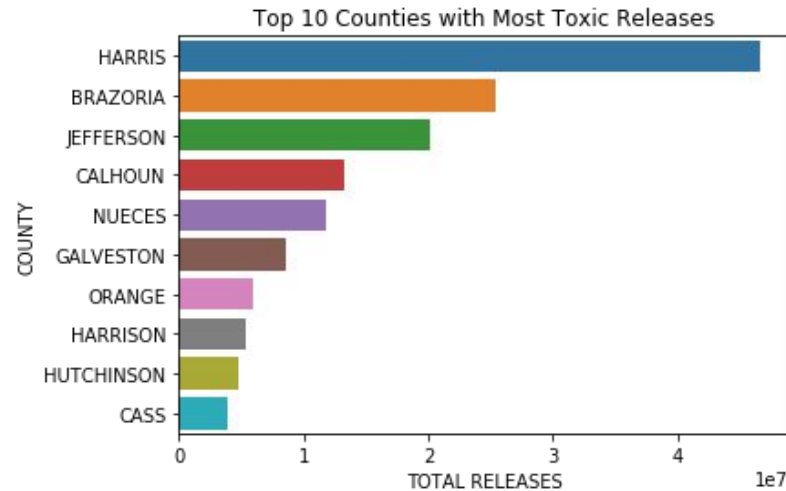
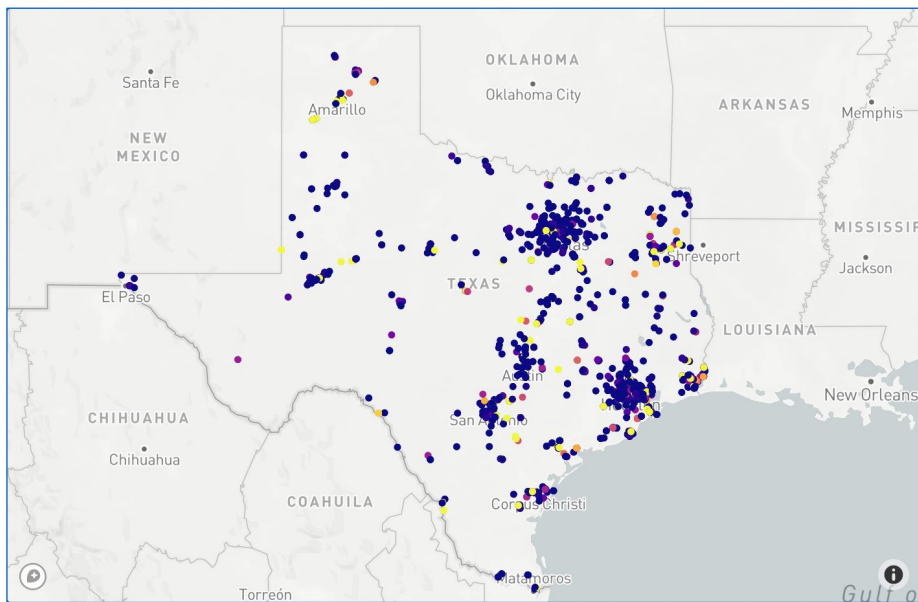
- US Environmental Protection Agency's (EPA) Toxic Release Inventory
- US Census Bureau

Only using 2019 data from Texas

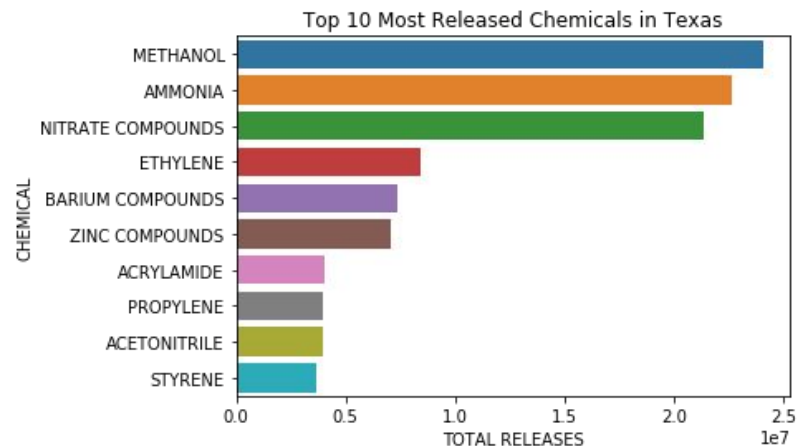
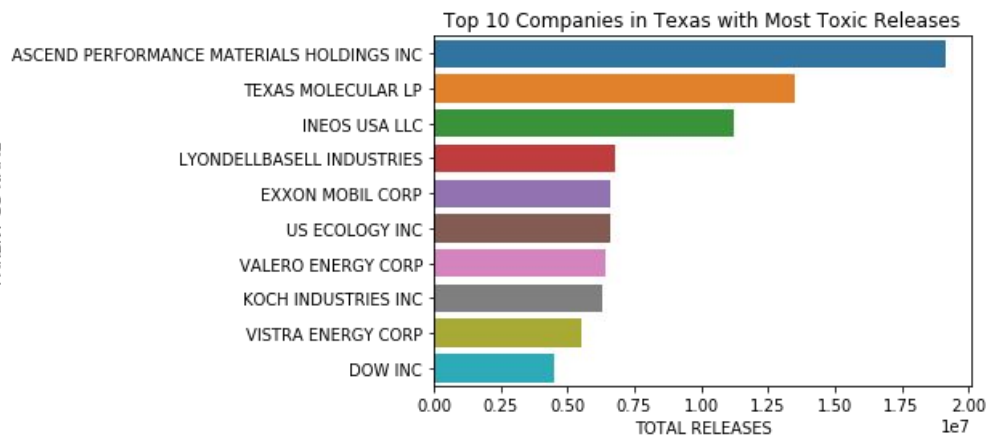
Merged the two datasets on ZIP code and selected features on race/ethnicity and income.

Toxic releases are measured in pounds

Data Exploration

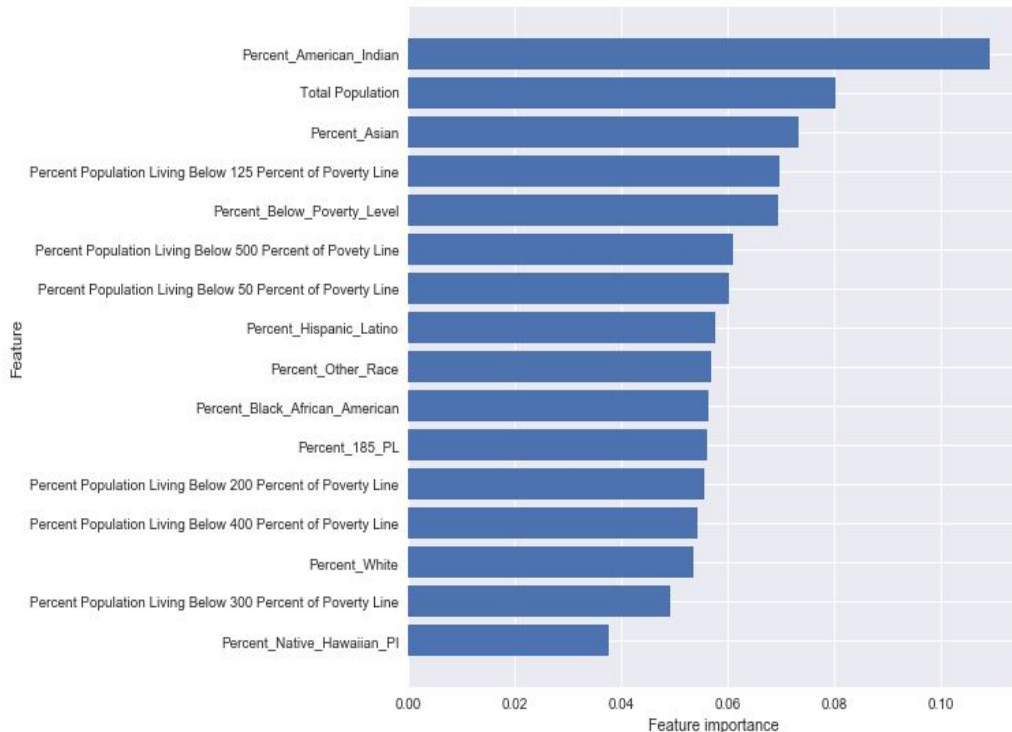


Data Exploration cont.



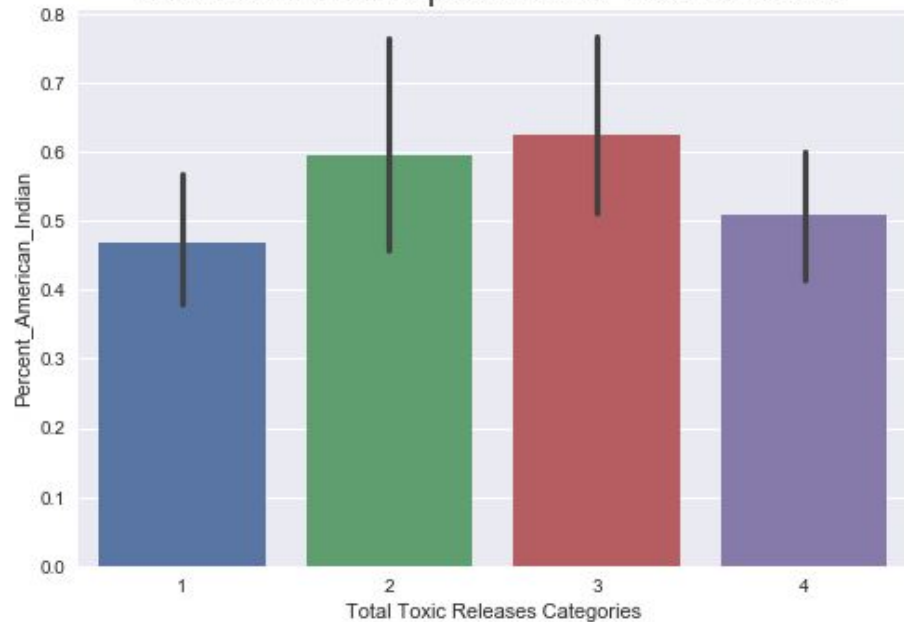
Analyses

- Looking at just carcinogens
 - Logistic regression model: 27.8% accuracy
- All chemicals
 - Logistic regression: 30.4%
 - Linear regression: R squared of 24%
 - Decision tree: 30.4%
 - Random forest: **45.22%**
- Harris county
 - Linear regression: 25.7%
 - Logistic regression: 20.1%

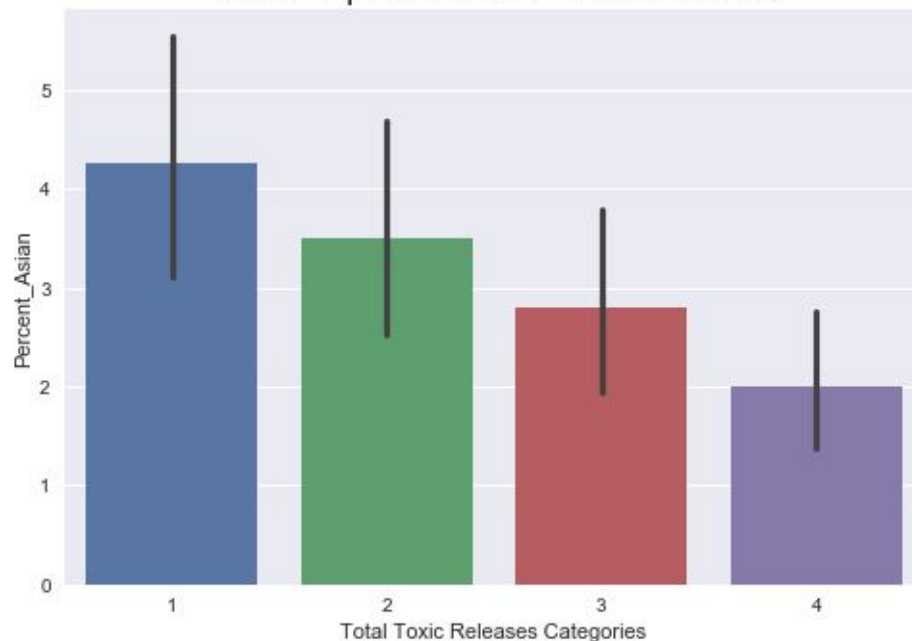


Exploring Important Features

American Indian Population and Toxic Releases

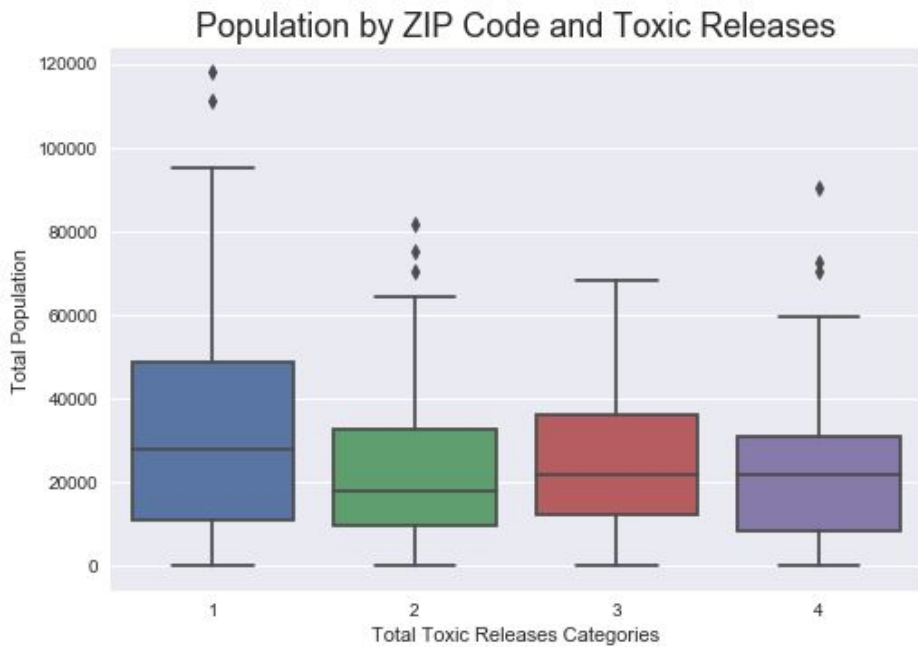


Asian Population and Toxic Releases

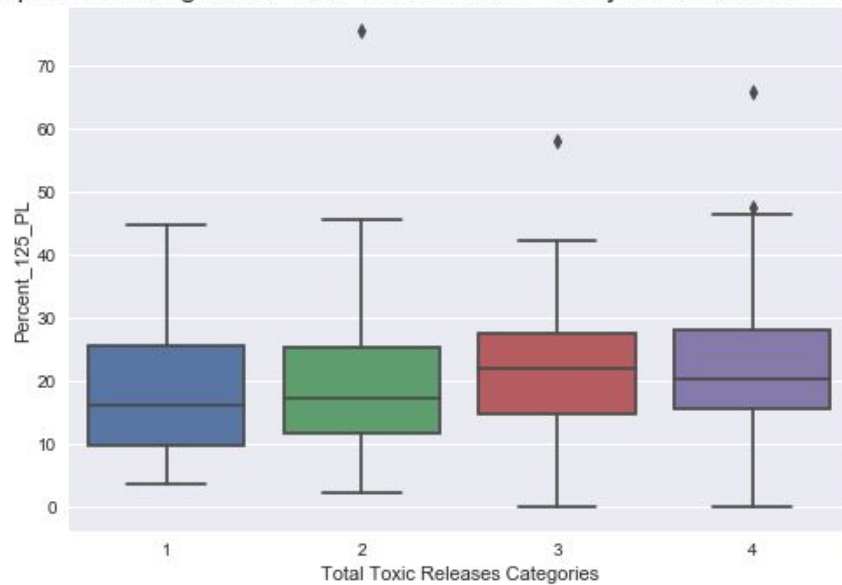


Categories: **1** = 0-12 lbs, **2** = 12-5000 lbs, **3** = 5000-55,000, **4** = 55,000-20,000,000 lbs

Exploring Important Features Cont.

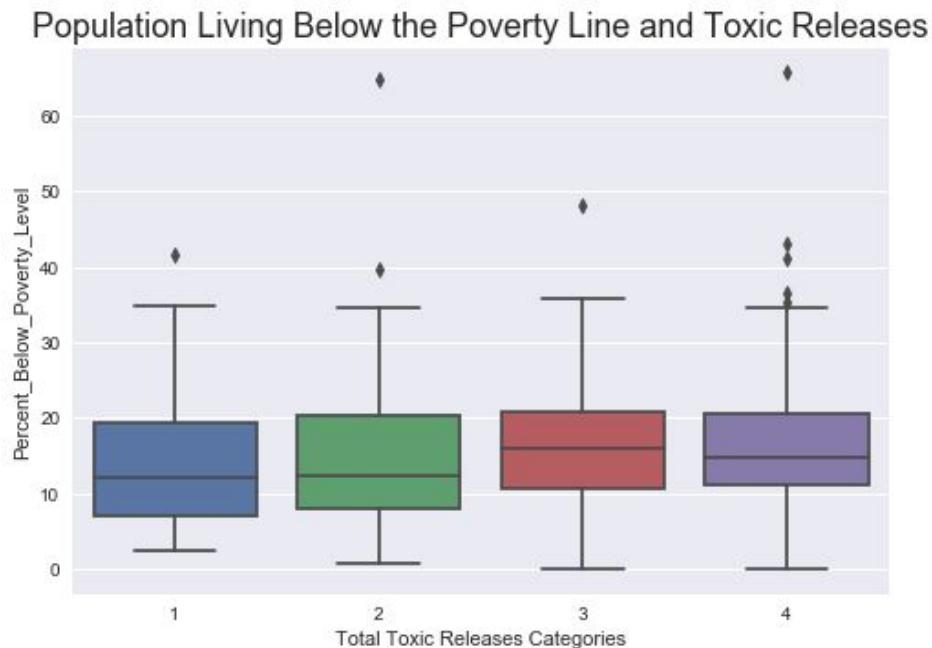


Population Living Under 125 Percent of the Poverty Line and Toxic Releases



Categories: **1** = 0-12 lbs, **2** = 12-5000 lbs, **3** = 5000-55,000, **4** = 55,000-20,000,000 lbs

Exploring Important Features Cont.



Categories: **1** = 0-12 lbs, **2** = 12-5000 lbs, **3** = 5000-55,000, **4** = 55,000-20,000,000 lbs

Conclusions

- Some relation between poverty and toxins released
- The higher the Asian population, the less toxins releases in that ZIP code
- American Indians only make up 1% of the Texan population
- Future studies can use other sources of pollution:
 - City dumps
 - Treatment facilities
 - Bus depots
- Also possible to look at the number of industrial sites in a neighborhood instead of the pounds of toxic releases

Thank you!