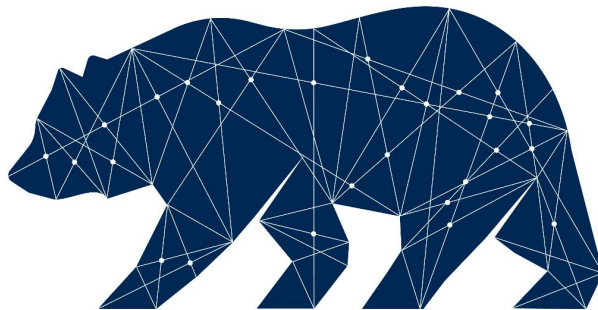


DATA CHALLENGE



★ ★ CALIFORNIA ELECTION 2022 ★ ★



UCDAVIS

DataLab

Data Science and Informatics

GitData

Proposition 30

Weilin Cheng, Hengyuan Liu, Kathy Mo, Li Yuan

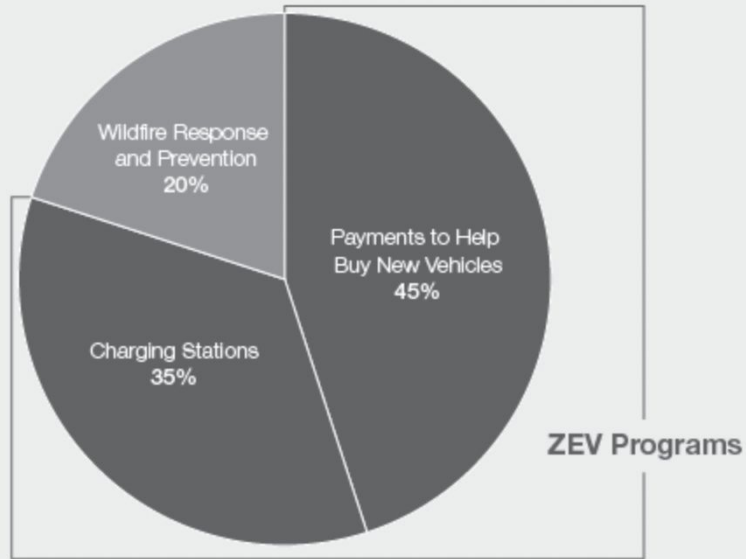
<https://github.com/GitData-GA/CA-Election-2022-Data-Challenge>

Proposition 30

- Proposition 30 is going to increase a 1.75% tax on Californians who earn above \$2 million per year to fund programs to increase the amount of zero emission vehicles and prevent wildfires. The tax plans to start in 2023 and will end by 2043 or earlier if we can maintain the expected amount of greenhouse gas emissions for three consecutive calendar years.
- Proponents think that Prop. 30 will reduce air pollution to reach ambitious climate goals.
- Opponents think that Prop. 30 tax is unnecessary and make more people flee California. They think Prop. 30 allows companies like Lyft and Uber to make more money.

Figure 1

Proposition 30 Uses Increased Revenue for ZEV Programs and Wildfire Activities



ZEV = zero-emission vehicle.

LAOA

Research Question

- How many electric cars do we need to produce to reduce air pollution to 80% below 1990 levels by 2050?
- The purpose of the plan is to fulfill state mandates to reduce planet-warming emissions 40% below 1990 levels by 2030 and achieve carbon neutrality by 2045.
- We arrived to this question by figuring out how the proposition will work to reduce greenhouse gasses. We wanted to learn more about how many ZEVs can be produced from the tax money and to see if the proposition was possible or not.
- We also considered greenhouse gas emissions from wildfires

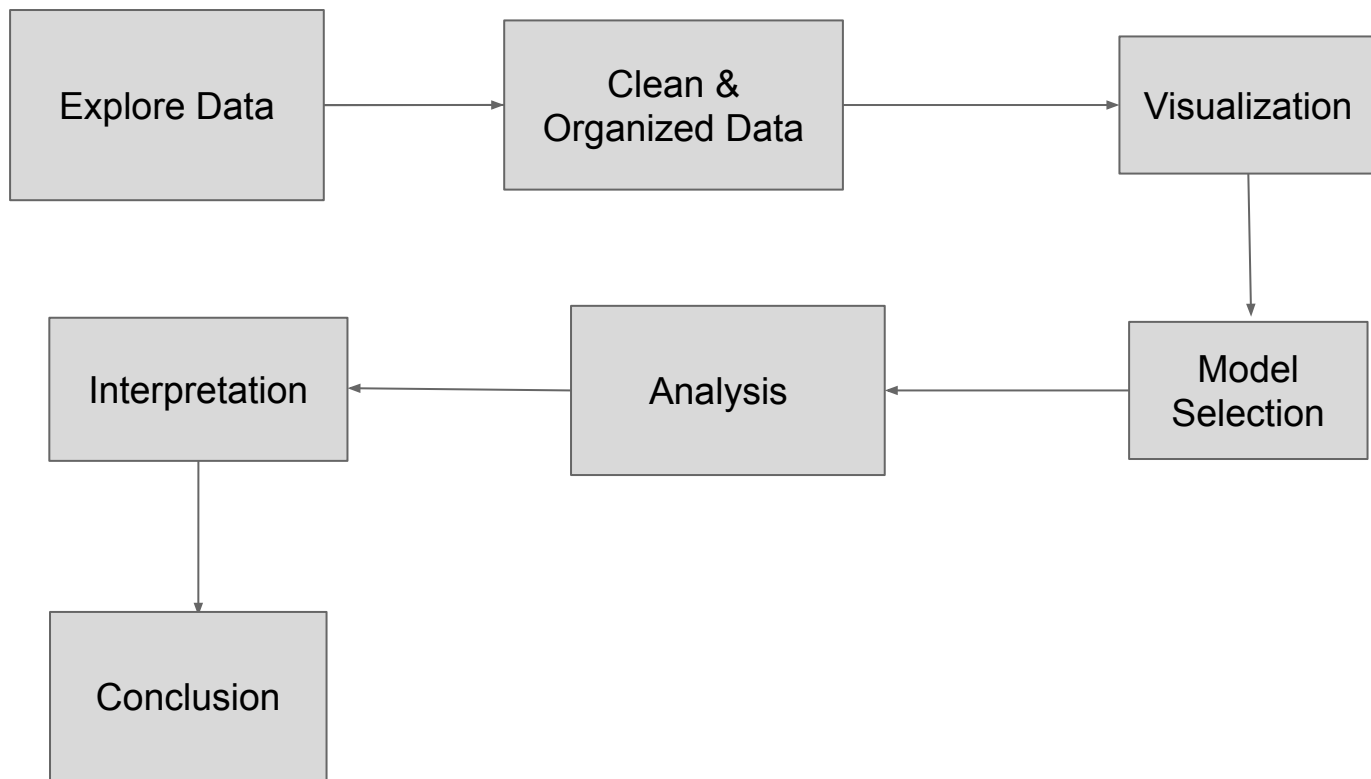
Data

- There are 3 data sets we are using.
 - California Air Resource Board called Emission FACtor (EMFAC) 2021
 - Franchise Tax Board of California
 - Legislative Analyst's Office and CO2 emitted by wildfire by California Air Resource Board
- Most of our datasets are from the California Government
- The Legislative Analyst's Office dataset only has 22 observations
- Links to the datasets:
 - <https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/Wildfire%20Emission%20Estimates%202000-2021.pdf>
 - <https://arb.ca.gov/emfac/>
 - <https://data.ftb.ca.gov/California-Personal-Income-Tax/PIT-Annual-Report-2020/s2q7-rtsh>
 - <https://lao.ca.gov/policyareas/state-budget/historical-data>

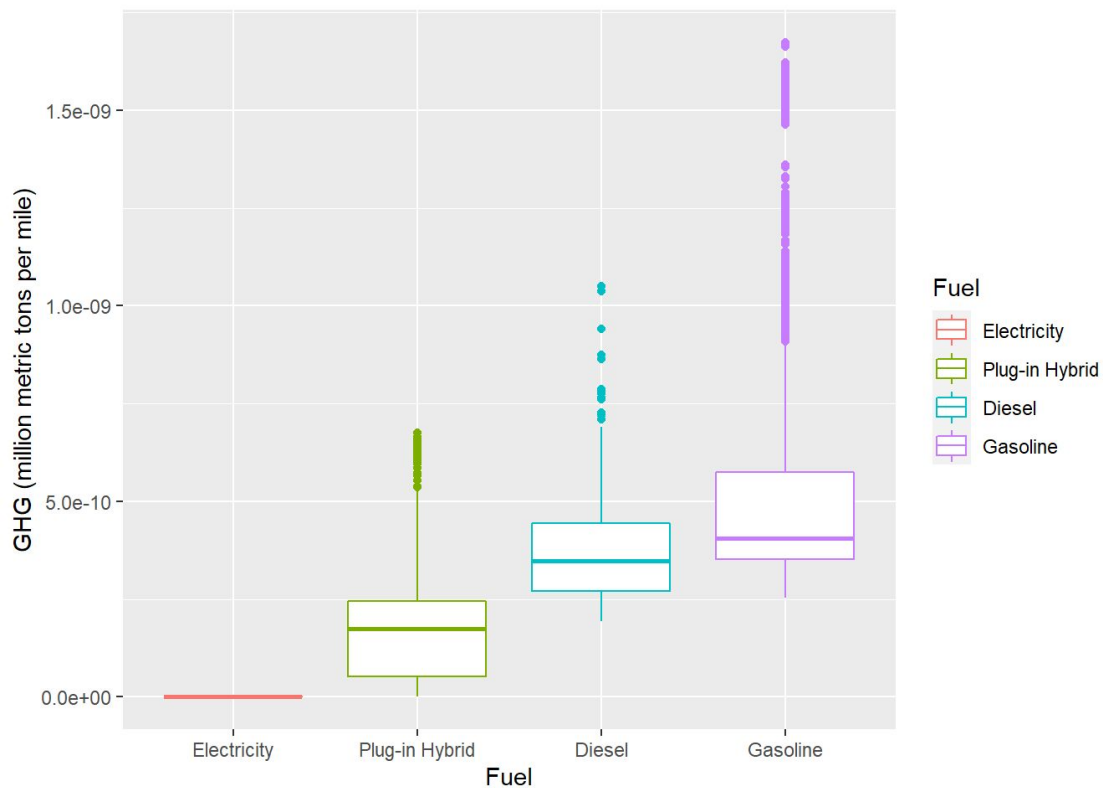
Approach

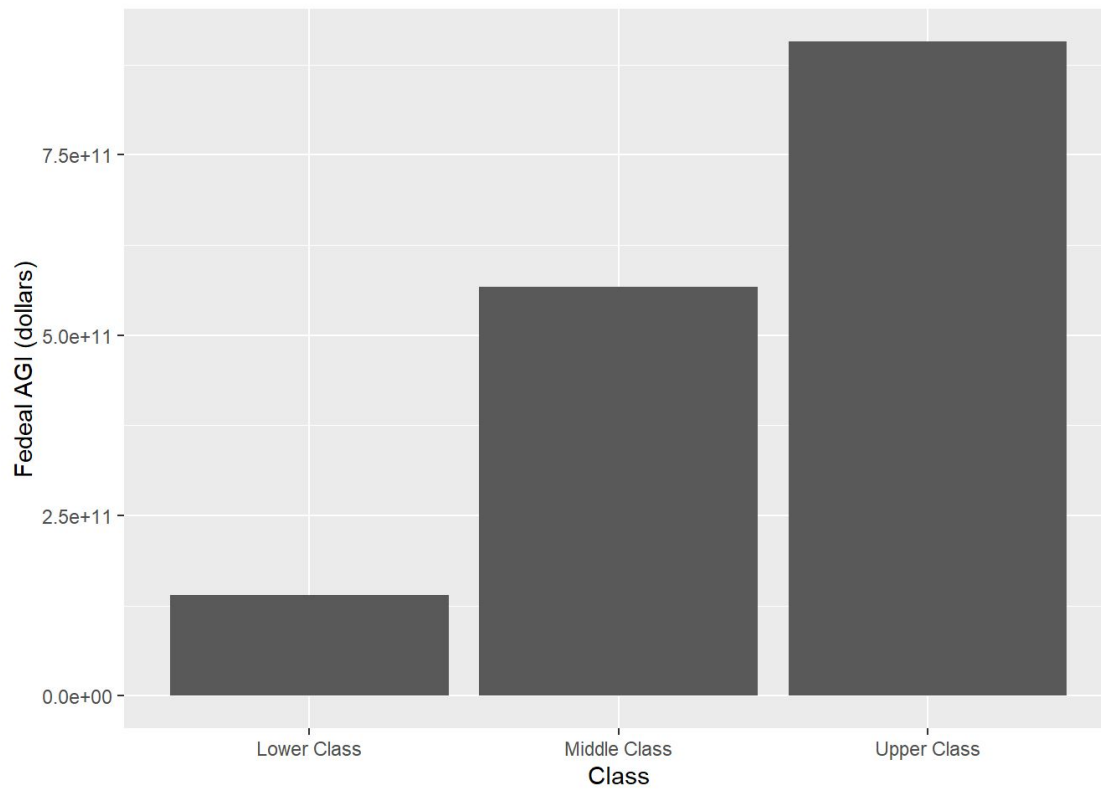
We made visualizations from our data by using R. We used box plots, histograms, and scatterplots to visualize our data.

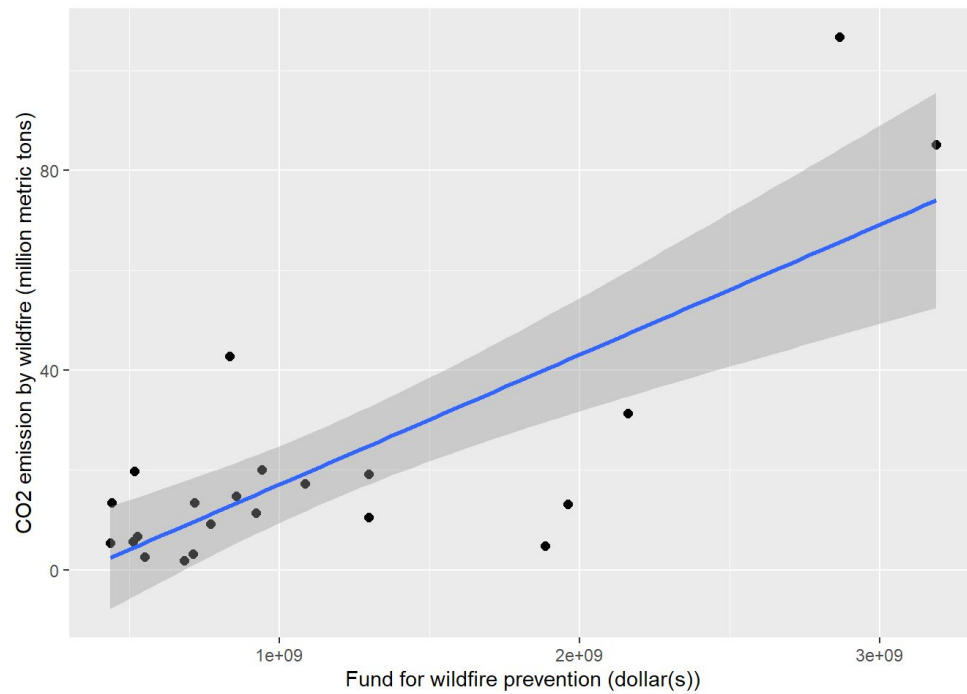
We used simple linear regression and Kendall's Tau to further analyze and draw conclusions.



Data Visualization







Conclusion for the proposition 30

- Through our analysis, we might not be able to achieve the goal, which is to cut greenhouse gas emissions to 80% below the level in 1990, which is 85.371 million metric tons by 2050, only by performing proposition 30, because we still have 232.975 million metric tons left even if we do not have wildfire and fossil fuel burning passenger cars

Conclusion

- We found out there are linear relationships between fuel types and greenhouse gas emissions. Moreover, We also find out that the money funded to wildfire prevention and CO2 emitted by wildfire are positively correlated.
- We found our data set has limitation, which leads us to use nonparametric test and gives us a positive correlation between fund and CO2 emission by wildfire.
- We are proud of ourselves for team-working, innovation, problem solving, critical thinking and communication
- Next time, we would like to use python instead of R and finish our map visualization.

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