Impact of climate-related weather events on public support for action against climate change in the United States

Motivation

- Climate change is a critical global issue, with major emitters like the U.S. playing a key role in addressing it
- Political division limits climate action due to differing party views and shifting public priorities
- Economic downturns often lead to a deprioritization of climate action by the public
- Climate change influences the frequency and intensity of weather events, which temporarily raise public interest in climate action
- The factors that drive long-term public support for climate policies remain unclear

Objective

- Investigate whether individuals in U.S. states more affected by climate-related weather events (e.g., storms, floods, tornadoes) prioritize climate change action
- Analyze the correlation between casualties caused by such events and public opinion on climate policies at the state level
- Research question: “Are people living in states with more casualties caused by climate related events more likely to support countermeasures against climate change?”

Data Sources

- **Dataset 1: Storm Events Database 2020 (NOAA)**
  - Statistics on injuries, fatalities, and damages from weather events per U.S. state
  - Creative Commons Zero License (CC0)

- **Dataset 2: Yale Climate Change Opinion Map 2020**
  - Public opinion on climate change topics, aggregated by state
  - MIT license

- **Format:** SQLite databases prepared with Jayvee
- **Data:** high-quality, well-documented, structured

Data Sources

Database	Column name	Description
political_opinion.sqlite	GeoName	Name of the U.S. State
	AverageOpinionTrend	Average percentage of the public to be in favor of action against climate change per state (averaged over multiple different items)
weather_event_damages.sqlite	STATE	Name of the U.S. State
	TOTAL_CASUALITIES	The total number of deaths and injuries caused indirectly and directly by weather events per state

Data Sources

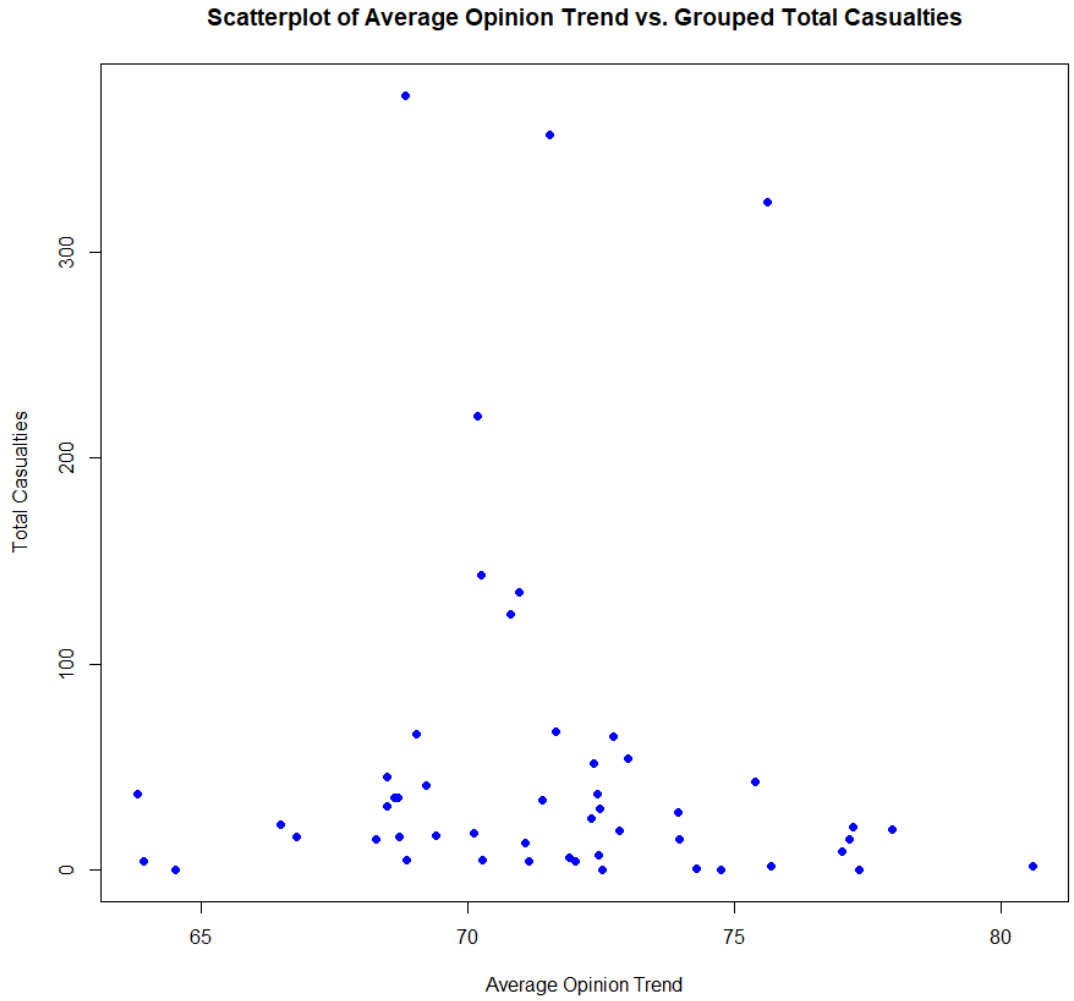
Database	Column name	Description
political_opinion.sqlite	GeoType	Type of data entry (State, county, etc.). Necessary for filtering data (only state level).
	CO2limits, CO2limitsOppose, drilloffshore, … (all others)	Average percentage of the public to be in favor of a specific action against climate change per state. Oppose is the item in reversed.
weather_event_damages.sqlite	INJURIES_DIRECT	Injuries directly caused by weather events
	INJURIES_INDIRECT	Injuries indirectly caused by weather events
	DEATHS_DIRECT	Deaths directly caused by weather events
	DEATHS_INDIRECT	Deaths indirectly caused by weather events

Methodology

- **Method**: Quantitative correlation analysis to identify statistical relationships between:
  - **Average Opinion Trend** (sentiment toward action against climate change)
  - **Total Casualties** (aggregated weather event impacts on human safety)
- **Tools:** R
- **<u>Analysis Steps</u>**
  1. **Data Aggregation**:
     1. Casualties per county aggregated by state.
  2. **Data Merging**:
     1. Joined datasets using state names (inner join).
     2. Excluded states missing in either dataset.
  3. **Correlation Calculation**:
     1. Pearson correlation coefficient measured linear relationship.
  4. **Visualization**:
     1. Scatterplot created to visualize and interpret the relationship.

Results

- **Dataset**: 51 data rows after inner join between opinion and casualty datasets
- **Correlation Result**:
  - Pearson correlation coefficient: **-0.051** (weak, negative relationship).
  - Indicates no significant linear relationship between the variables.
- Majority of casualties between 0 and 100 per state
- Public support for climate action between 60% and 90%



Interpretation

- **Key Finding**: No significant correlation between political sentiment and weather-related casualties

- **Findings don't necessarily speak against hypothesis**:
  - Negative correlation unlikely based on existing research
  - Positive relationship expected due to personal impact influencing political priorities

- **Alternative Explanation**:
  - **Conspiracy Tendencies**:
    - Dire situations may push some people toward conspiracy theories or simplified answers
    - Example: Climate change denial in certain political groups (e.g., "hoax" sentiment)

  - **Data Limitations**:
    - Small sample size (51 data points)
    - High variance: many states with 0 and over 200 casualties

  - **Outlier influence:**
    - Limited data makes difficult to remove outliers

  - **State-level aggregation:**
    - State-level data may not reflect individual-level dynamics
    - County-level analysis with finer-granular data could be more accurate

Conclusion

- No significant correlation found
- Results are most likely due to technical and conceptual faults
- Results show the complexity of factors influencing political opinions (or rather how they are not easily determined)
- The field needs more research with more fine-grenular data with longer time-periods