Kristof, Emory. "Tennessee Power Plant", United States." *National Geographic*.

Global Warming: A State Analysis

Overview

Global warming refers to the long-term increase in Earth's average surface temperature due to human activities, primarily the emission of greenhouse gases like carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). These gases trap heat in the atmosphere, creating a "greenhouse effect" that intensifies the warming of the planet. While Earth's climate has naturally fluctuated over geological timescales, the current rate of warming is significantly faster than can be explained by natural processes, such as volcanic activity or variations in solar radiation. This accelerated warming has been driven largely by industrialization, deforestation, energy production from fossil fuels, and other human behaviors.

Dangers

Global warming contributes to a range of environmental changes, including rising sea levels, melting polar ice, more extreme weather events, disruptions to ecosystems, and threats to biodiversity. It is a critical component of broader climate change, which encompasses shifts in weather patterns, ocean currents, and other climate systems.

## Only 63.26% of National Population Concerned!

The Report

The report will offer insights into how states compare to the national percentage of citizens concerned with Global Warming. It will also compare factors like each state's political ideology, education, and economy to provide more information on what factors influence global warming attitudes.

The Data

This dataset was constructed by Sociologist Evan Cooper of Farmingdale State College, Farmingdale NY and supplemented by Sociologist Beth Ann Whitaker of the University of Michigan, Ann Arbor, MI by combining state-level publicly available data from a variety of sources.

How Does Concern for Global Warming Compare by State?

The dataset estimated the percentage of each state's population who are worried about global warming. This was reported as percentages, the higher meaning more of the population is concerned with global warming.

Estimated % who are worried about Global Warming
49.18   72.06
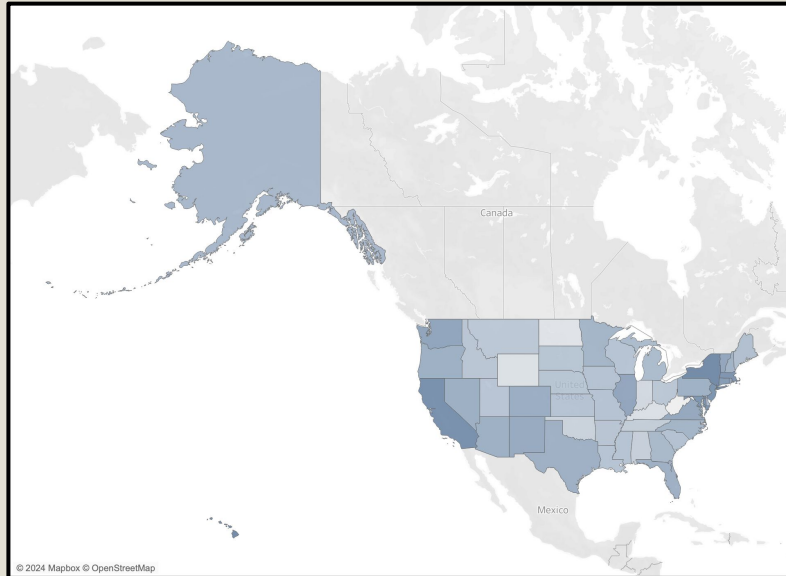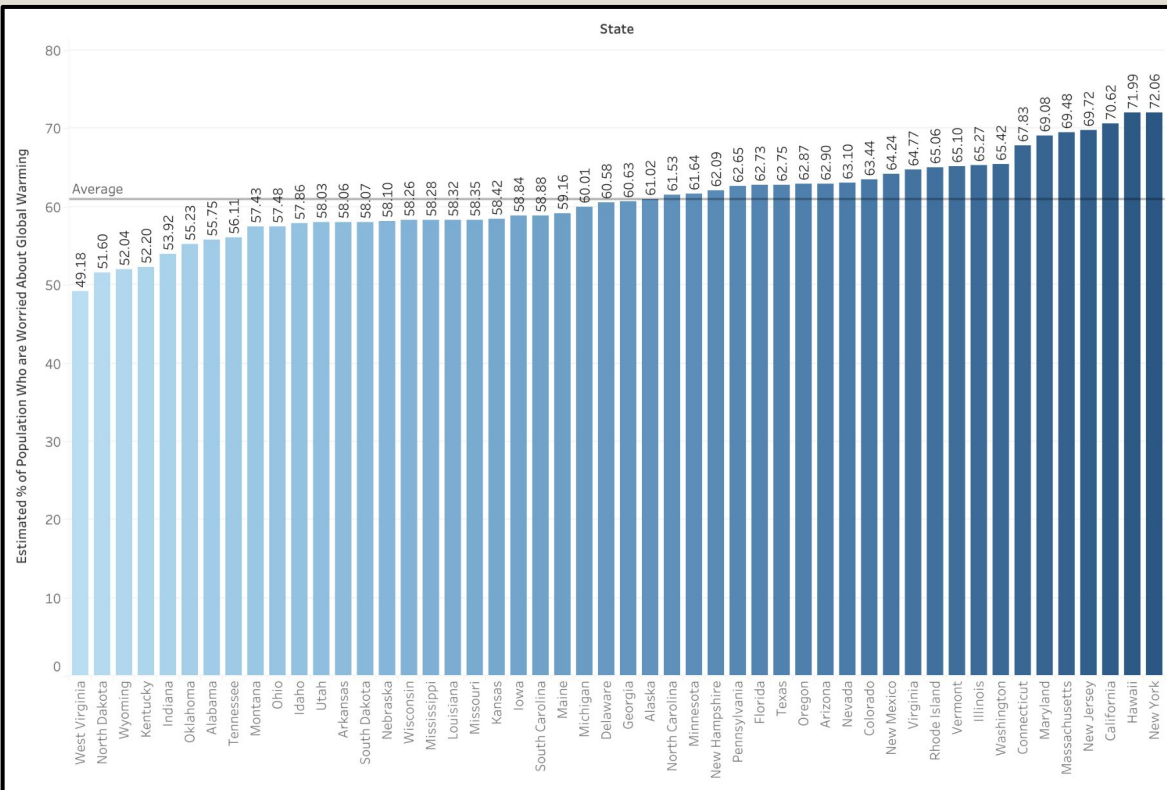
The Average Concern:
60.96 with a Standard Deviation of 5.27

Most Concerned State:
New York at 72.06

Least Concerned State:
West Virginia at 49.18

Factors that May be Linked to Global Warming Concern Levels:
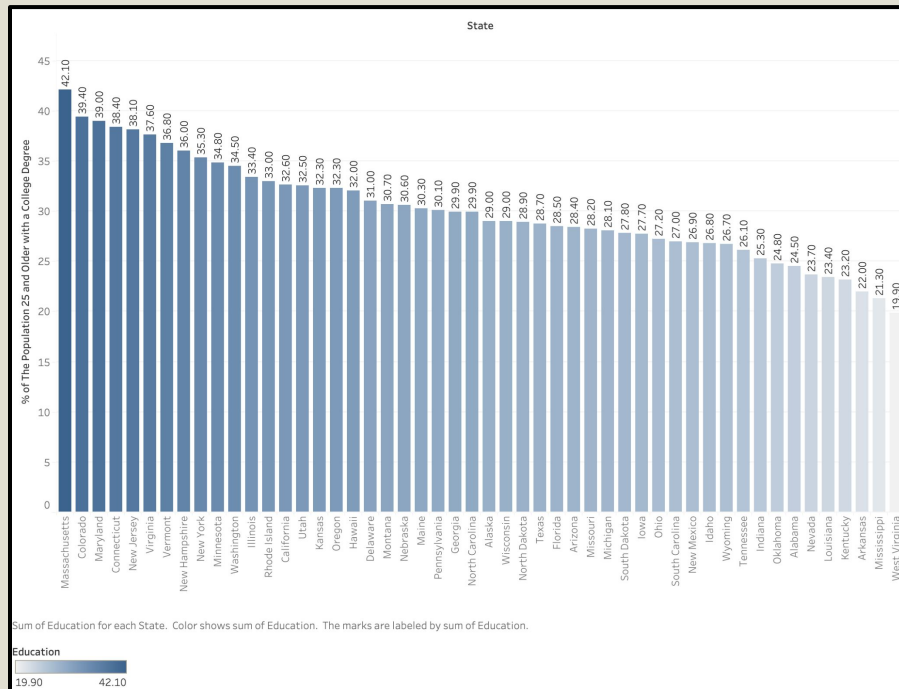
Education

Economy

Political
Ideology

Education

Why it could be influential:
Those who are more highly educated have had more exposure with the concept of global warming, and are more familiar with the factors that cause it. This could cause them to be more concerned.

How the states compare:
- The highest education level is Massachusetts, which is above averagely concerned.
- West Virginia is the lowest in education level, and in concern

State

Sum of Education for each State. Color shows sum of Education. The marks are labeled by sum of Education.

Education
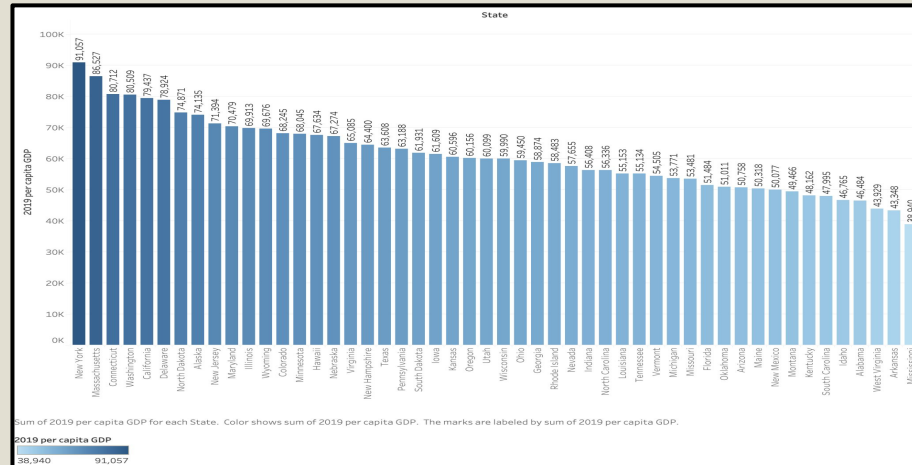19.90   42.10

Economy

Why it could be influential:
Places with lower economies may be less concerned with climate change and global warming because they are more concerned with other things.

The Two Measures:
- Median Income in 2018
- Per Capita GDP in 2019

How the states compare:
- North Carolina had the lowest median income in 2018, but is average in concern
- Kentucky had the lowest GDP in 2019 and is below average in concern

Sum of Median Income 2018 for each State. Color shows sum of Median Income 2018. The marks are labeled by sum of Median Income 2018.

Median Income 2018
42,781   86,345

Sum of 2019 per capita GDP for each State. Color shows sum of 2019 per capita GDP. The marks are labeled by sum of 2019 per capita GDP.

2019 per capita GDP
38,940   91,057

Political Ideology
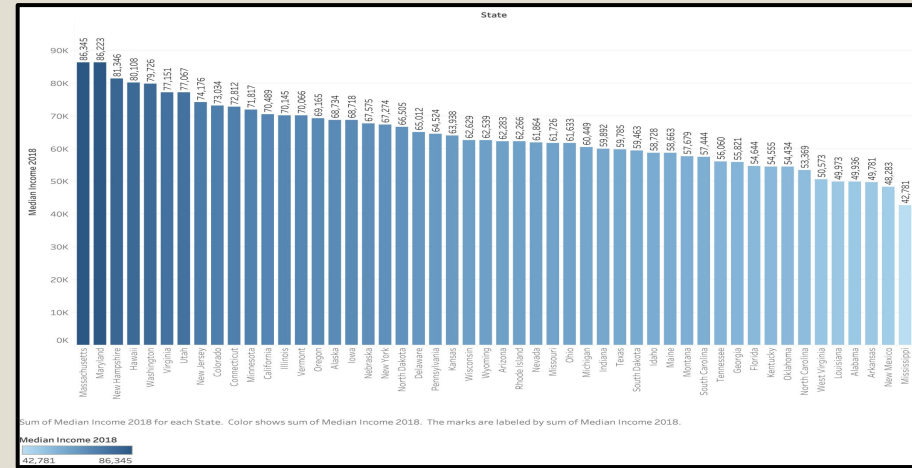
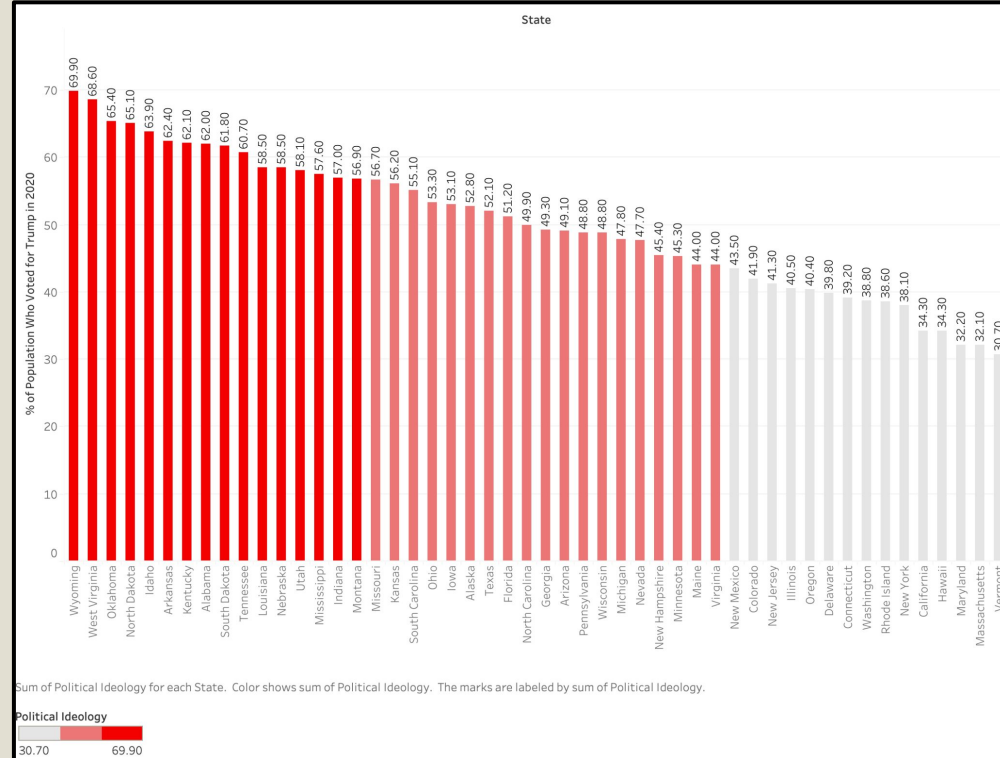**Why it could be influential:** Global warming is a debated topic between the right and left wing. The right wing tends believe that global warming either does not exist or is not something to be concerned about. Therefor, those who voted for Trump in 2020 are most likely less concerned.

How the states compare:
- The state with the highest percentage of citizens who voted for Trump is Wyoming which is below average in concern
- The state with the lowest percentage is Vermont, which is above average in concern

State

% of Population Who Voted for Trump in 2020

Wyoming 69.90, West Virginia 68.60, Oklahoma 65.40, North Dakota 65.10, Idaho 63.90, Arkansas 62.40, Kentucky 62.10, Alabama 62.00, South Dakota 61.80, Tennessee 60.70, Louisiana 58.50, Nebraska 58.50, Utah 58.10, Mississippi 57.60, Indiana 57.00, Montana 56.90, Missouri 56.70, Kansas 56.20, South Carolina 55.10, Ohio 53.30, Iowa 53.10, Alaska 52.80, Texas 52.10, Florida 51.20, North Carolina 49.90, Georgia 49.30, Arizona 49.10, Pennsylvania 48.80, Wisconsin 48.80, Michigan 47.80, Nevada 47.70, New Hampshire 45.40, Minnesota 45.30, Maine 44.00, Virginia 44.00, New Mexico 43.50, Colorado 41.90, New Jersey 41.30, Illinois 40.50, Oregon 40.40, Delaware 39.80, Connecticut 39.20, Washington 38.80, Rhode Island 38.60, New York 38.10, California 34.30, Hawaii 34.30, Maryland 32.20, Massachusetts 32.10, Vermont 30.70

Sum of Political Ideology for each State. Color shows sum of Political Ideology. The marks are labeled by sum of Political Ideology.

Political Ideology
30.70   69.90

Linear Regression

While the model overall is significant, only **Political Ideology** has a statistically significant relationship with **Worried** among the independent variables. This means that political ideology is correlated to the level on concern about global warming.

Variable	P-Value	Direction
Political Ideology	<0.001 Significant	Negative
Education	0.631 Not Significant	Positive
Economy: Median Income 2018	0.494 Not Significant	Negative
Economy: Per Capita GDP 2019	0.156 Not Significant	Positive

Conclusion

States differ in their concern for global warming primarily due to political ideologies, as evidenced by the linear regression model which found that the relationship between political ideologies and level of concern for global warming is statistically significant.States with more conservative or Republican-leaning populations tend to exhibit less concern for global warming, likely reflecting ideological skepticism toward climate policies or prioritization of economic over environmental issues. Other factors, such as education, per capita GDP, and median income, were not statistically significant, suggesting that political alignment is a dominant driver of these differences. This highlights the impact of the varying political cultures in each state on their perception of global issues.

Overall:
- Political ideology is the likely explanation for the differing in concern about climate change by state
- Factors like Economy and Education do not impact this significantly

Appendix

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Residuals:
    Min      1Q  Median      3Q     Max
-5.8385 -1.3636  0.3449  1.2081  4.6405

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)
(Intercept)           7.878e+01  5.448e+00  14.460  < 2e-16 ***
Education             7.455e-02  1.539e-01   0.484    0.631
Politics             -4.177e-01  5.142e-02  -8.124 2.28e-10 ***
`2019 per capita GDP` 6.402e-05  4.436e-05   1.443    0.156
`Median Income 2018` -4.771e-05  6.924e-05  -0.689    0.494
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.387 on 45 degrees of freedom
  (949 observations deleted due to missingness)
Multiple R-squared:  0.8113,    Adjusted R-squared:  0.7946
F-statistic: 48.38 on 4 and 45 DF,  p-value: 9.706e-16
```