



MSIS 2629 DASHBOARDS, SCORECARDS & VISUALIZATION

Individual Project Report

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Project Motivation

Since the day, Donald Trump has assumed the office of the President of America, there has been a long-standing question amongst the people of research community - What will he mean to Science? If we look into his election campaign, science was barely mentioned in it.

I wanted to know the take of Republican Party and its supporters (which I consider to be highly anti-science) on the issue of climate change. Global climate change has already had observable effects on the environment. Glaciers have shrunk, ice on rivers and lakes is breaking up earlier, plant and animal ranges have shifted and trees are flowering sooner.

But do Republican people believe in these facts?

A month before the 2008 US presidential election, sociologists Riley Dunlap and Aaron McCright (of Oklahoma State and Michigan State, respectively) published a prescient **study** on the rapidly growing partisan gap on issues of environmental and climate protection.

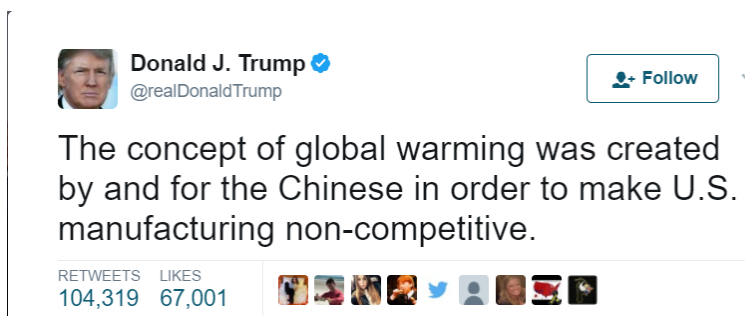
They concluded by speculating that a win by Sen. John McCain, an outspoken climate champion, could represent "a sea change among Republican Party leadership on the issue of climate change," whereas an Obama victory "could see Republican trends toward increased skepticism continue for the next several years."

Now Dunlap and McCright (along with Oklahoma State's Jerrod Yarosh) have **updated their study**, giving us a fresh look at public opinion on climate change at the end of the Obama era.

I wanted to understand if the partisan gap is really true? Do Republicans deny climate change because they are Republicans and that's what they do?

What we see is surprising: Polarization only accelerated after 2008, the gap between the parties is wider than ever, and the trend shows no sign of stopping.

Climate change in this document refers to climate change caused by human activities



Earth's climate is always changing. In the past, Earth's climate has gone through warmer and cooler periods, each lasting thousands of years. Before looking into whether Republicans believe in climate change or not, let's first verify with evidence whether climate change is really an issue.

I regularly follow NASA's research on Global Climate Change. According to their study, Ninety-seven percent of climate scientists agree that climate-warming trends over the past century are very likely due to human activities, and most of the leading scientific organizations worldwide have issued public statements endorsing this position.



Fig 1: Rise of CO2 level over centuries

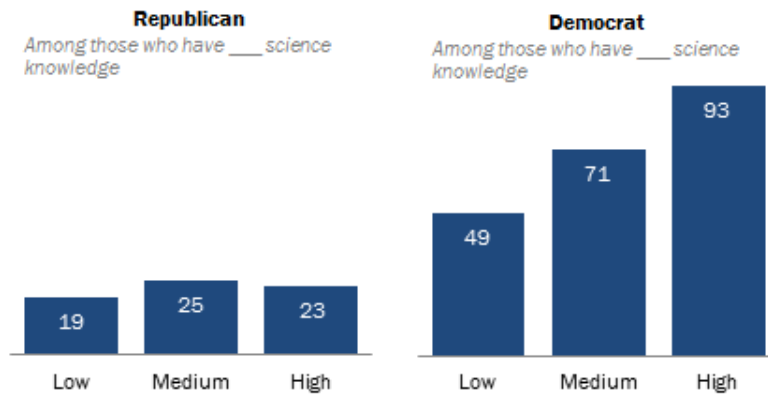
The current warming trend is of particular significance because most of it is extremely likely (greater than 95 percent probability) to be the result of human activity since the mid-20th century and proceeding at a rate that is unprecedented over decades to millennia.

Having established a strong reason to believe in climate change, let's look at the partisan divide between the Republicans and Democrats on the belief of climate change:

Pew Research shows that Increased scientific literacy does seem to increase acknowledgement of climate change among Democrats, but it does not have the same effect on Republicans.

Most Democrats with more science knowledge believe climate change is due to human activity, but there is no difference by science knowledge among GOP

% of Republicans or Democrats who say the Earth is warming due to human activity



Note: Beliefs about climate change include those who "lean" toward each response. Those who did not give an answer not shown. Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean to a political party not shown.

Source: Survey conducted May 10-June 6, 2016.

"The Politics of Climate"

PEW RESEARCH CENTER

Fig 2: Partisan divide over belief in climate change

Considering this research and the fact that climate change is happening, for the citizens of US, I would like to put forward my claim – GOP is majorly climate change denialist party.

To analyze this, I looked into the 2016 Presidential Elections voting scenario. Below we see the GOP votes with respect to every county in United States.

Further I tried to analyze the percent of people who oppose that climate in each county and compare the results with the voting scenario. We see the following two maps:

Here is a county-level map of 2016 presidential election voting results:

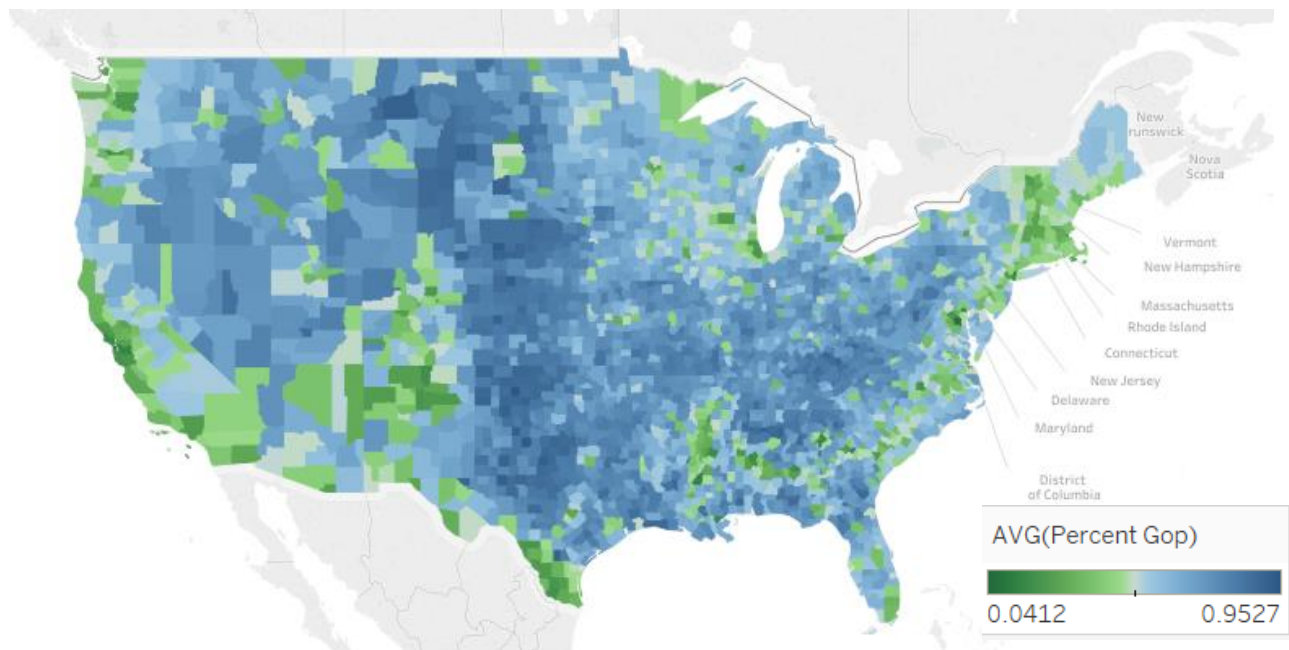


Figure 3. Voting Preference

Now here's the map of belief that deny humans are causing climate change

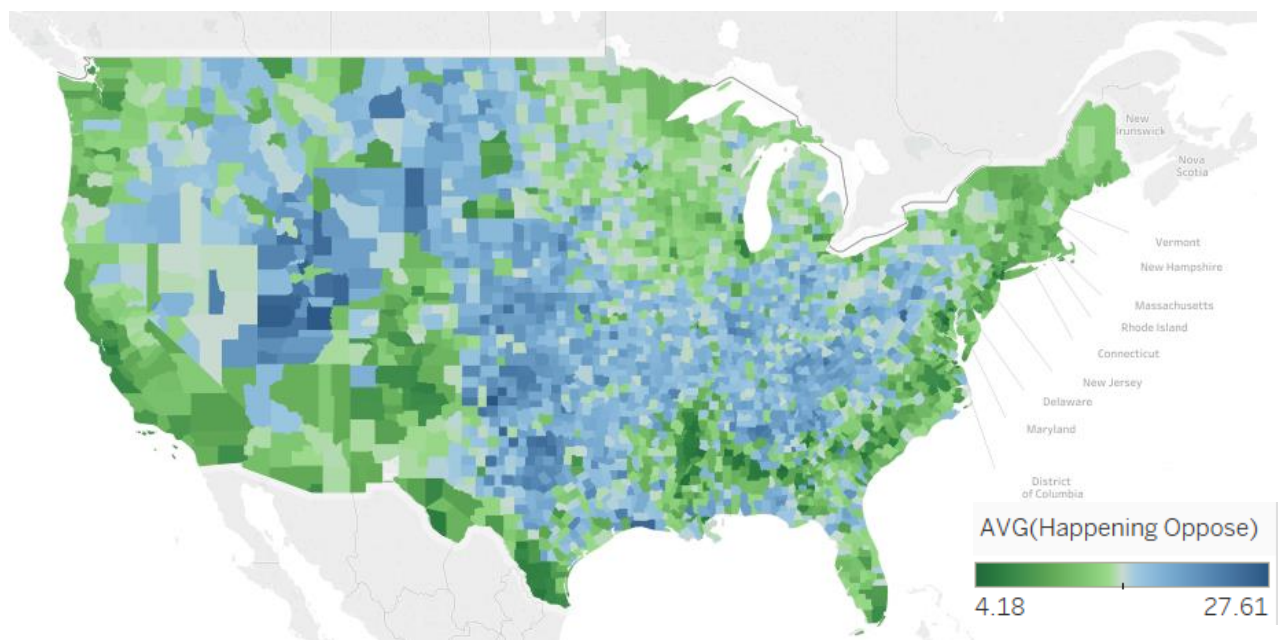


Figure 4. Climate change belief trend

Notice any similarities? A lot right? They are very much identical.

To further reinforce the claim I plotted a correlation between voting preference and oppose in climate change

Happening Oppose & Republican Votes

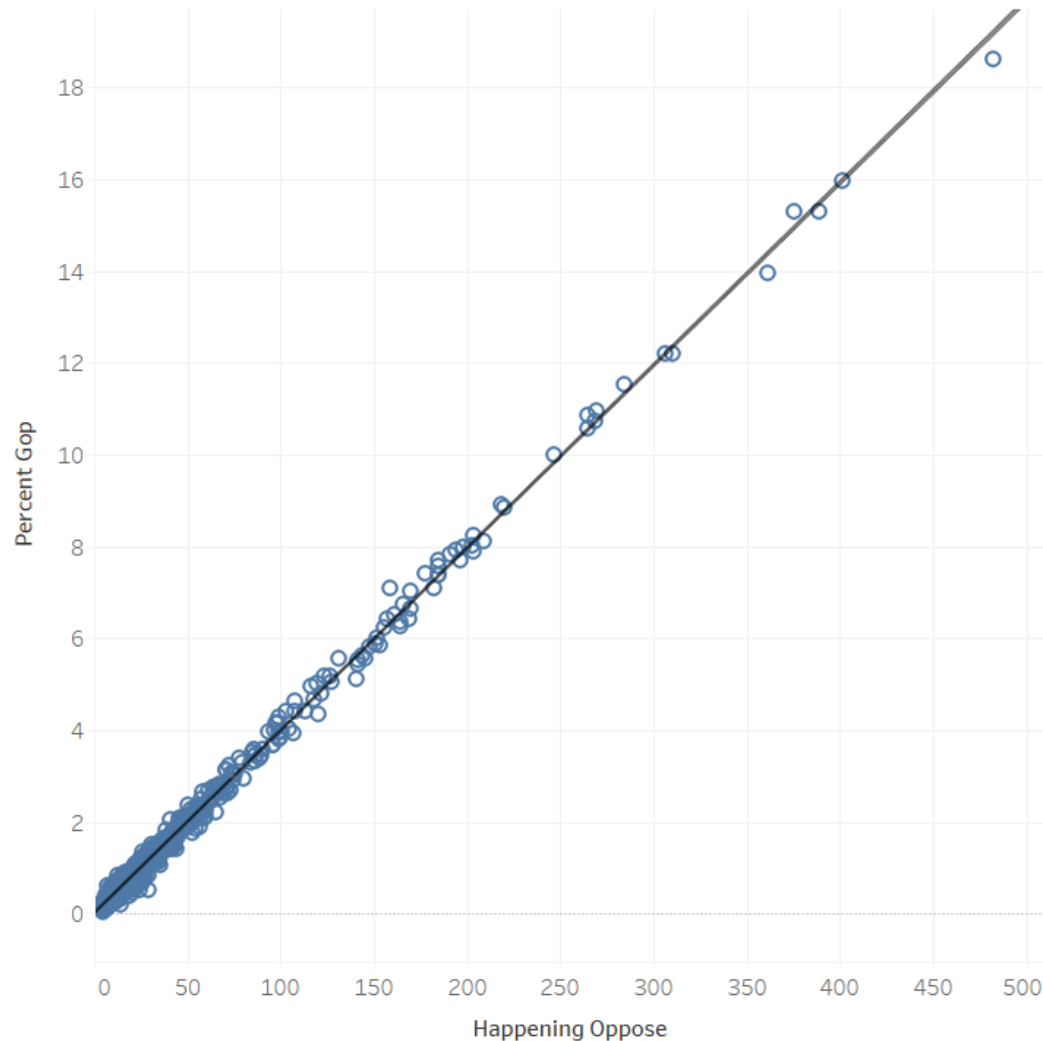


Figure 5. Happening Oppose vs Republican votes

The above claim is supported by Vox Media in this article:

<https://www.vox.com/science-and-health/2017/3/23/15032488/climate-beliefs-2016-election-votes>

To further assess that whether this denial is just a Republican thing or they don't believe in it because they haven't experienced it, I looked into the billion-dollar weather and climate disasters by each state from 1870 till current time. These disasters include events like droughts, floods, freezes, severe storms, tropical cyclones, wildfire and winter storms.

Here is the map with disaster counts over more than 40 years in each state

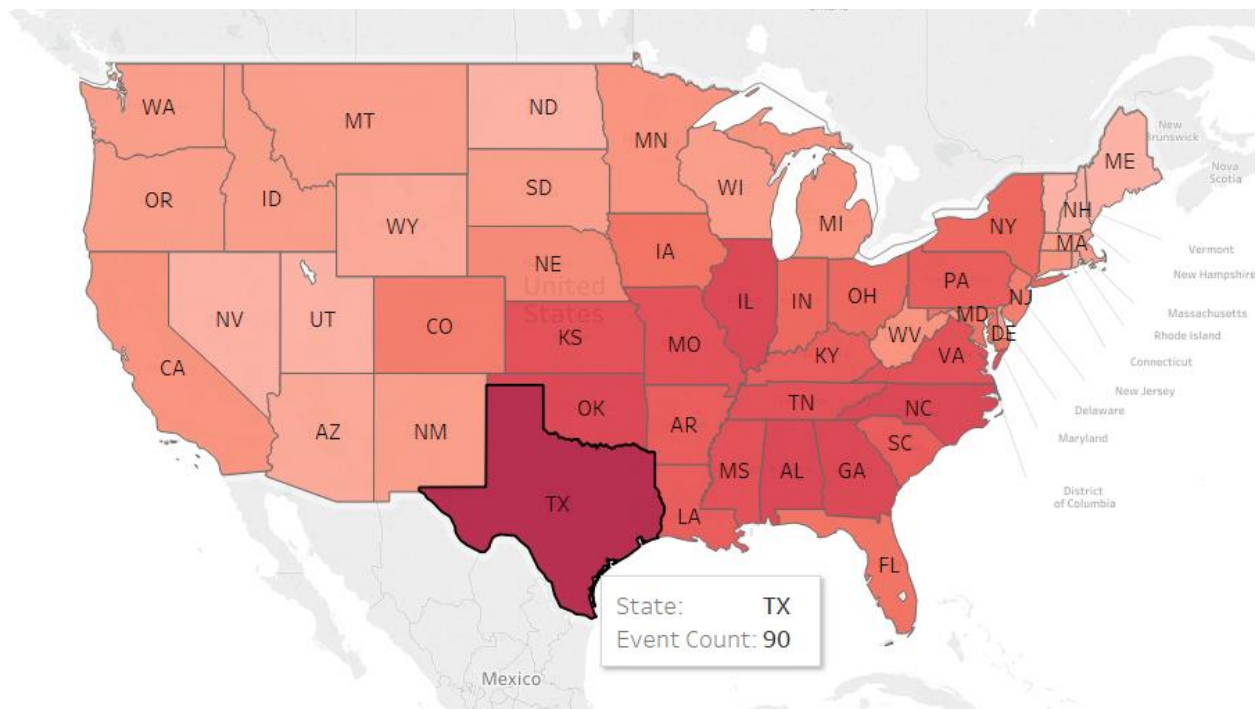


Figure 6. Climate disasters- event count

Now lets look only at the highly Republican states. We will consider only those states where voting preference to the Republican party is more than 52%.

Voting Scenario

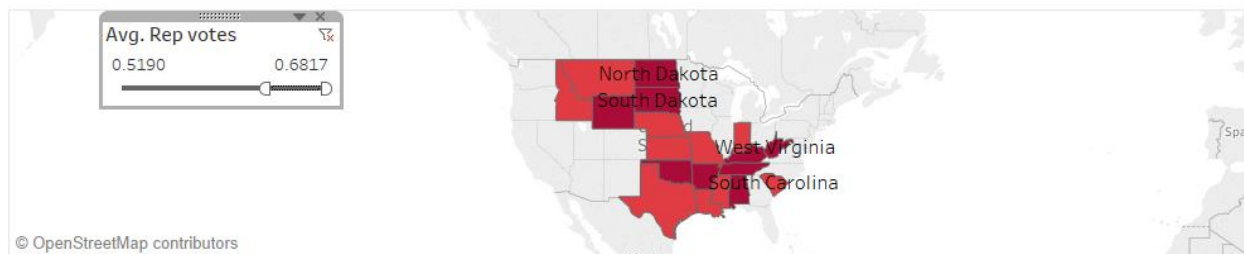


Figure 7. Republican States – States where majority of people have voted for Republican Party

If we see the average climate change happening oppose state wise, we can see that the states in the central US stand out the most which are the exact the highly Republican states.

We can see this from the map below:

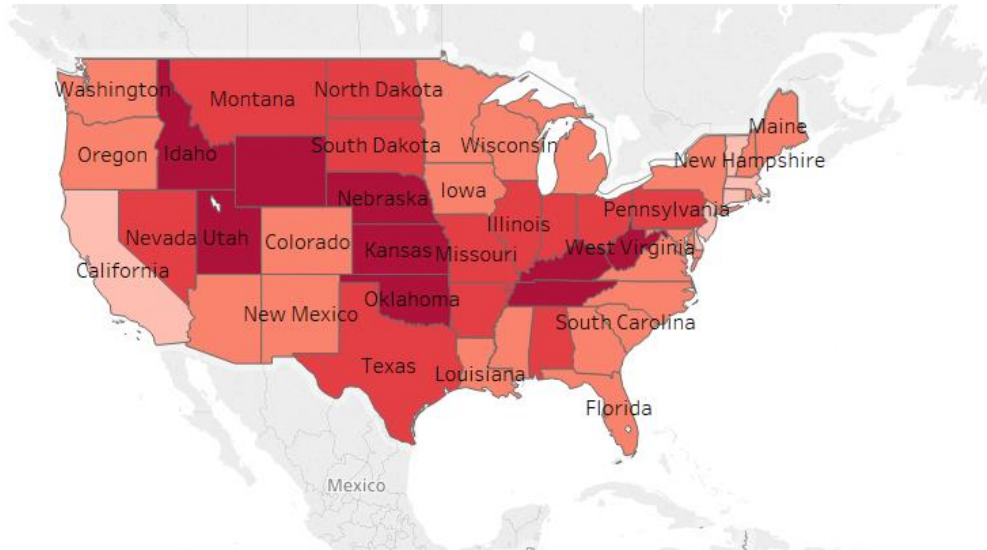


Figure 8. Climate change oppose state wise

Lets take into account the climate disasters in these states. We find the states in the northern part of US have low event count and high oppose towards climate change. Reasonable! We can say that as people in these states aren't much exposed to the climate change, they are skeptical about it.

Relating Climate Change Oppose, Climatic Disasters and Rebutican votes

Climatic Disasters

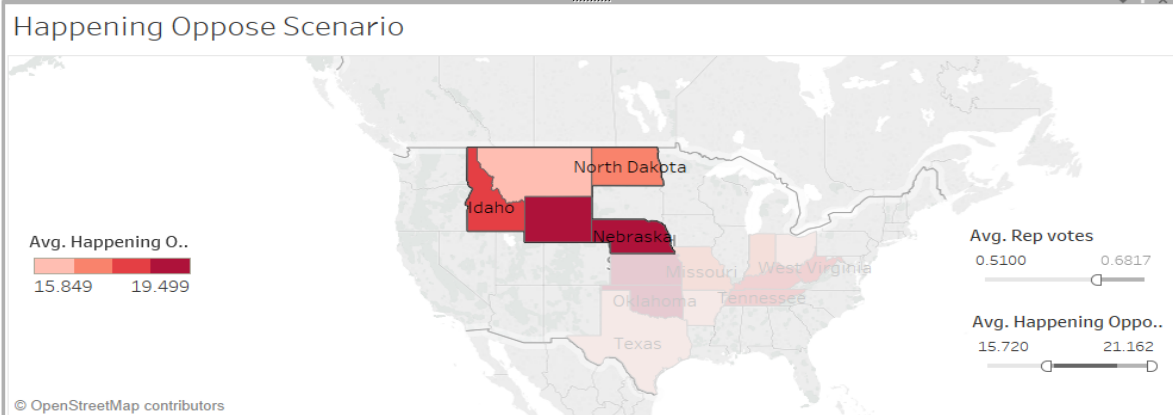
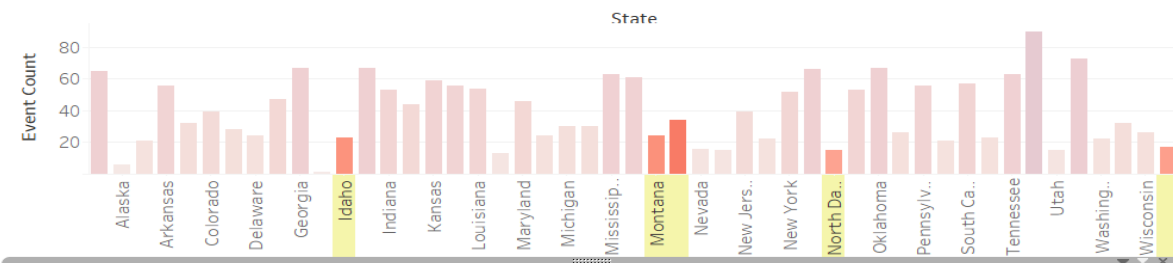


Figure 9. Highly Republican states – North USA

But looking into the rest of the Republican states in the middle and southern part we find exact opposite trend. The people in these states are against climate change even though they have experienced more than 60 climate related disasters in the past.

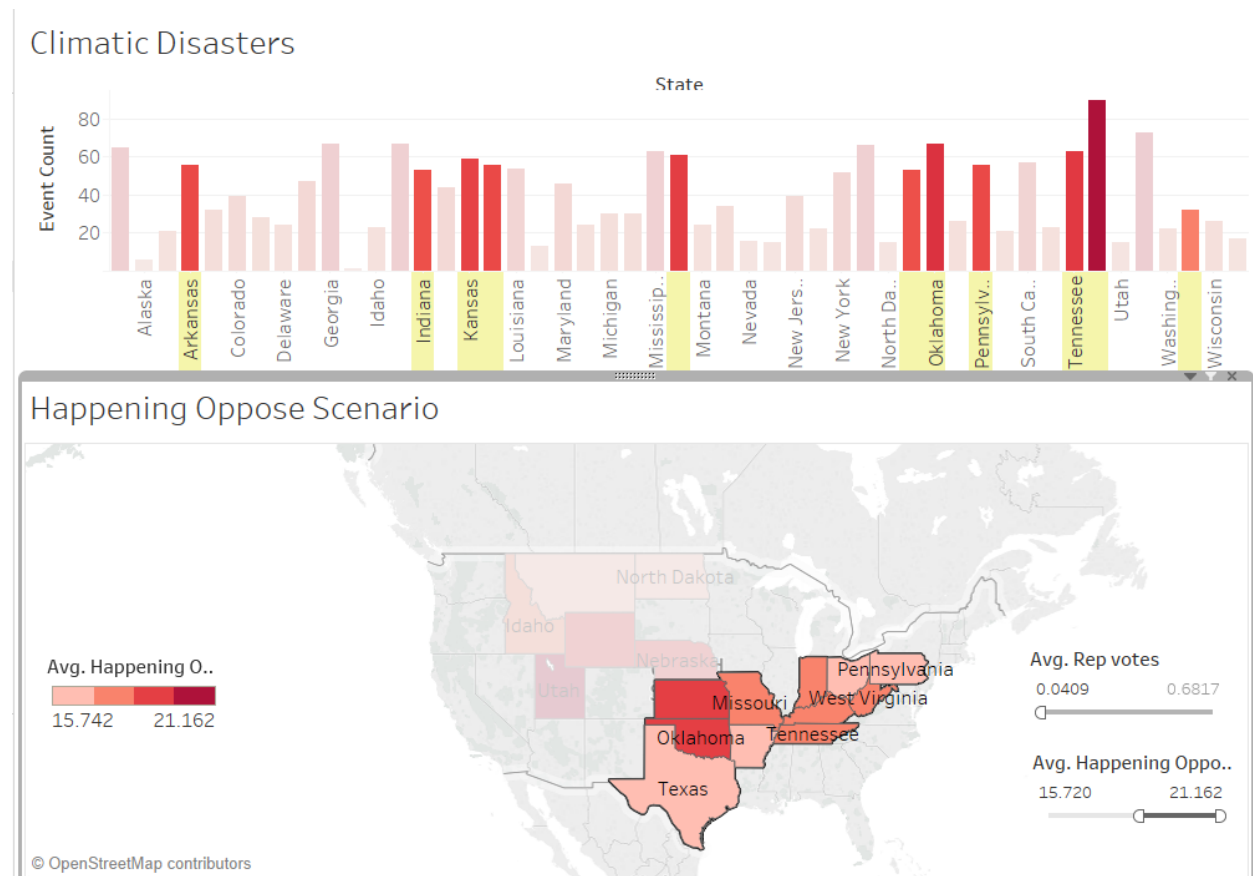


Figure 10. Highly Republican states – South USA

From this we see conclude that that there is a trend among Republicans to oppose climate change whether they have experienced it themselves or not.

Challenges:

- County level data of disasters caused by climate change would have given a better understanding of the events-belief-votes mapping scenario
- Next challenge would be to identify more reasons for the climate change denial, and partisan polarization

References:

<https://www.vox.com/science-and-health/2017/3/23/15032488/climate-beliefs-2016-election-votes>

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Data Sources:

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<https://www.ncdc.noaa.gov/billions/mapping>

Climate Change

<http://climatecommunication.yale.edu/>

US Presidential elections

<https://catalog.data.gov/dataset?tags=elections>