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INFO 3300 - Project 2

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Project 2 Write-Up: Temperature and Natural Disasters

Global climate change has become an ever growing threat across the entire planet, with the potential to deal a near impossibly large amount of damage to people and wildlife alike. However, such seemingly gradual change often difficult for many to properly understand on a individual basis, since the slight changes in climate over several decades is just about impossible to feel or notice, despite it's very real consequences. Our data visualization tries to properly illustrate at least a portion of these changes. Through a combination of average temperature and natural disaster data for the United States, our map allows the user to directly visualize the drastic change in temperature over the past half-century, as well as some of the serious consequences of such change.

The data average temperature and natural disasters were acquired from the National Oceanic and Atmospheric Administration (NOAA) and the Federal Emergency Management Agency (FEMA) respectively. The temperature data was divided by state, with average temperatures recorded for each month dating back to 1956. The natural disaster data on the other hand was divided primarily by year, dating back to 1953, which each individual incident having a recorded declaration date, state, and type (Ex: Wildfire, hurricane, storm, etc). In our visualization, we used all available data to depict information for 48 states (Alaska and Hawaii are excluded) between the years of 1956 and 2016.

Much of the information had to be properly formatted to function correctly in our site. For the temperature data, we merged the data for all separate state files into one csv file for easier access. Additionally, since average temperature was recorded by month, we set up a script to average the temperatures for the 12 months of each year to get the true average for that year. Natural disaster data went through a similar merge process, with the only notable change being disaster type categories were slightly altered to properly group similar types of disasters (Ex: Various snowstorm types were categorized together under “Snowstorms”).

The grid map itself utilized a simple csv file containing state names, abbreviations, and x and y coordinates, with only change being made being the removal of Alaska and Hawaii. In the visualization itself, states were represented with circles, with each circle containing the temperature and natural disaster data for that state.

We used a combination of color scales and icons to represent the changes in temperature and natural disasters in each state. For temperature, we used a linear color scale (a quantized color scale more specifically), to represent the difference between the each state's overall average temperature, and the average temperature for that year, with red representing a hotter year and blue representing a cooler year. This allows the user to get a better sense of the overall changes in temperature over time. Natural disasters on the other hand were represented through various icons present inside each state circle, with each different icon corresponding to a different disaster type (buttons on the left side are available highlight specific disaster types). If the number of natural disasters in a state exceeds four for a particular year, that states border will become highlighted, and hovering over that state will reveal all additional disasters for that year.

For all states, hovering over them will provide more specific data in regards to the exact difference in temperature and total number of disasters.

In addition to the interactive visualization, we have also included an accompanying static line graph to show the change in number of natural disasters over time. The graph simply plots the combined number of disasters across all states over the past 50 years, with a linear regression line added to show the positive correlation between the variables.

The visualization itself illustrates a number of drastic changes over the past half century in terms of both climate and natural disasters patterns. When comparing the first six years of data (1956 to 1961) to the last six years (2011-2016) it's very clear that there has been a sharp increase in natural disasters across the country. For example, there nearly four times as many disasters in Texas alone in 2011 as there were in all of 1956. Additionally, temperature patterns have become far more erratic in recent years, with 2012 and 2016 both having multiple states with temperatures significantly higher than their averages. We hope that this data illustrates not only the changes that are occurring in our climate, but also helps paint the picture of the very real consequences of these changes. It's difficult for the average person to understand the issues behind say, a three degree increase in a state's average temperature, but with natural disaster data, they can see first hand what those changes can bring.

Links

Natural Disasters in America by Year: <https://www.fema.gov/disasters/grid/year>

Average Temperate in America by Year:

<https://www7.ncdc.noaa.gov/CDO/CDODivisionalSelect.jsp>

Grid Map: <https://github.com/kristw/gridmap-layout-usa>

Final Status Report

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Note: Some tasks were shifted around between last week's status report and this week's, nonetheless all tasks planned from last week were completed.

Amy Zhong/asz35:

Tasks completed for this status report:

- Grid map completed.
- Work on natural disaster icons.
- Html/css completed.
- Code cleanup and optimization.

Liam Delaney/lgd34:

Tasks completed for this status report:

- Scales implemented with corresponding keys.
- Year slider fully functional.
- Write up completed
- Minor cosmetic improvements to svg.

Harrison Unruh/hju3:

Tasks completed for this status report:

- Additional work on natural disaster icons, specifically hover effects.
- Minor cosmetic improvements to svg.
- Natural disaster filters added.
- All around bug fixes and tweaks