How the Conversation Surrounding Climate Change has Shifted

DIG HUM 100: Theory and Method in the Digital Humanities by Dr. Adam Anderson | Jessica Yang | July 1, 2021

Introduction and Product Description

Since 1880, the global average surface temperature has increased by about 2 degrees celsius. This clearly has large implications as sea levels rise, arable land decreases, and a multitude of other issues arise. However, climate change was not always discussed the same way it is today, so this project will explore how the conversation surrounding it has shifted over the years (1980's, 1990's, and 2000's).

Tools and Method

- **Newspaper3k:** web scraping tool to scrape NYT articles
- **Pandas** : to import data as a dataframe in Jupyter Notebook
- **NLTK:** clean data and remove stopwords
- Plotly for article count visualization
- **WordCloud:** visualize common words and find underlying themes
- **Plotly and Matplotlib:** creating line and bar graphs

Hypothesis

I expect that the 1980's will be more about noticing a trend in increasing temperatures, the 1990's will be about starting to worry about possible consequences, and the 2000's will be more information in terms of causes and solutions.

Exploratory Questions

- How have the themes surrounding the conversation of climate change shifted over the years?
- Was there an increase in the popularity of articles written about climate change?
- Was climate change misunderstood in the past?
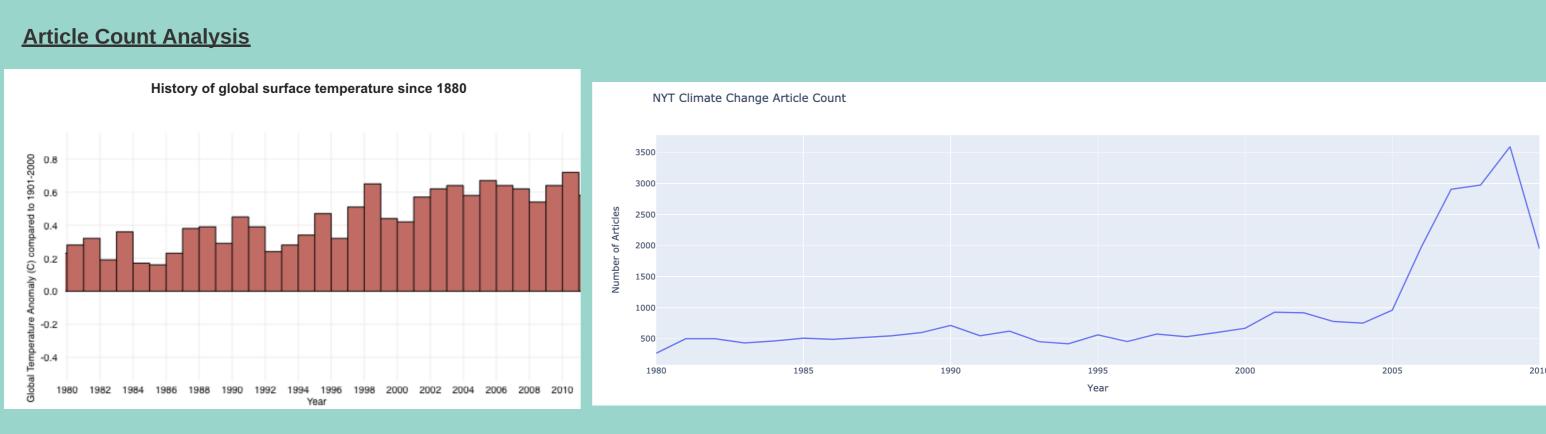- Is there overlap between how it is discussed today vs. in the past?
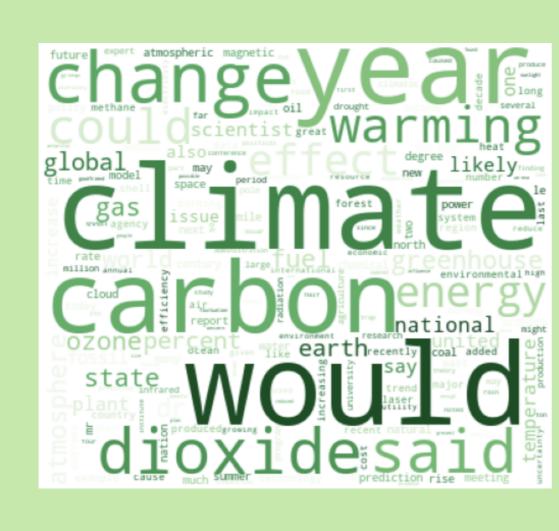
Description of Dataset

For my dataset, I will be using 25 NYT articles from each decade (75 total). In order to get the content in each of these articles, I searched "climate change" in the NYT archives and took the top 25 articles for each decade. I then used newspaper3k to web scrape these articles and transfer them into a csv file. In order to find common themes, I will be using Word Clouds and bar graphs showing the most common words for each decade.
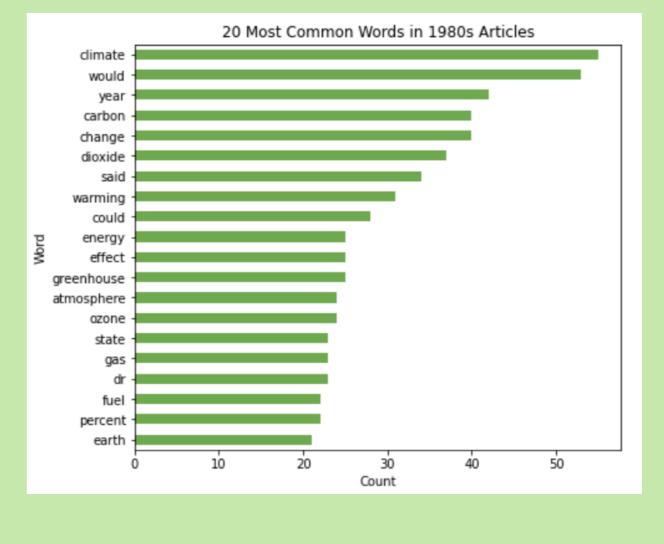
Additionally, I wanted to see how the popularity of articles about climate change has increased over the past 30 years, so I found the number of search results with the keyword "climate change" in the NYT archives. I then plotted this next to a graph I found on www.climate.gov that shows how the average global surface temperature has increased over the past 30 years!
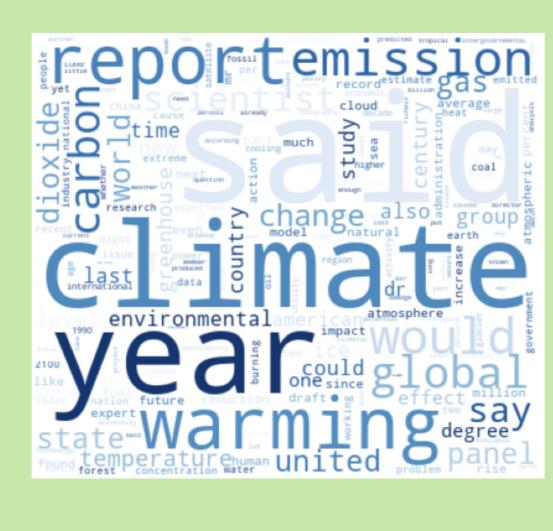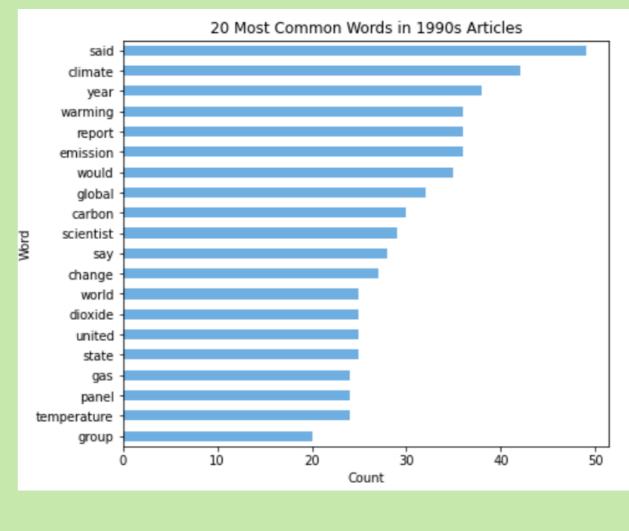
Article Count Analysis
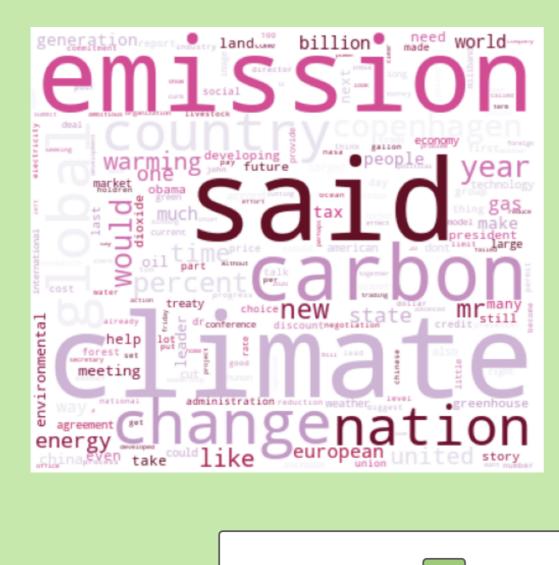

Interpretation

The current visualizations show that as the global surface temperature increased during this time, the number of articles about climate change increased as well, however not at the same constant rate. In the 1980s, there were 4,831 serch results, in the 1990s, there were 5,480 search results, and from 2000-2010, there were 16,487 search results. It is also interesting that the number of articles about climate change spikes after 2005, and there is a dramatic difference between earlier years. After some research, I found that this is possibly due to the fact that 2005 was the second warmest year on record. Overall, the increase in global surface temperature and the NYT archive search results for "climate change" do not seem to be directly correlated.
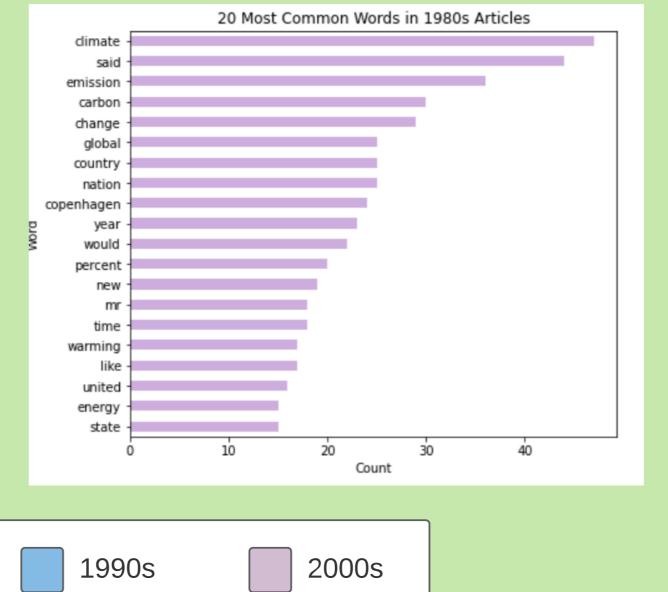

Decade: 1980s | 1990s | 2000s

Major Themes for Each Decade

After creating word clouds and bar charts to visualize the most frequent words, the following were the top three words for each decade:

1980s: "climate," "would," "year,"
1990s: "said," "climate," "year,"
2000s: "climate," "said," emission"

Interpretation

It seems that there is a lot of overlap, but shifts definitely develop between each decade, as there are two words in common within each subsequent decade, showing how themes are progressing.

At first, some might find words such as "would" and "said" to be irrelevant, but I think it tells a different story. In the 1980s, the effects of global warming were first starting to get noticed, with little concrete evidence and understanding of the phenomenon. Much of it was based on speculation, which words like "could" and "would," both of which appear frequently in the 1980s, clearly indicate.

Over time, as scientists found more evidence, words such as "said" were mostly associated with what experts in the field had stated regarding their discoveries on the reality of global warming and climate change. This word is appears most frequently in the 1990s and 2000s.

Finally, in the 2000s, more technical and specific words like "emission" and "carbon" appear more frequently as the specific sources and causes of climate change were becoming clearer. The theme moves away from speculation and questioning, to more causes as well as policies with words including "global," "country," "nation," and "policy" appearing in the top 10 most frequently used words. Discussion about policy makers and global treaties and agreements were definitely becoming increasingly popular during this time, as people realized that action needed to be taken to address this urgent issue of climate change.

Conclusions

Overall, the popularity of climate change articles has increased greatly over the past 30 years. As more time has passed since climate change was first starting to be noticed in the 1980s, the language shifted from onr of questioning and speculation to a discussion of policy and evidence. The more we look at how language shapes and develops on important issues like these over time, the more we can understand how it affects our policies and beliefs.

Next Steps/Future Work

In order to get a larger and more accurate picture of how the discussion surrounding climate change has shifted, I would be interested in analyzing articles from many different sources rather than just the New York Times. There is no doubt that each publication has some bias, which could affect the general themes presented from decade to decade. Including more publications would help me to better understand patterns of shifts as larger picture.

Going off of that, I would be interested in seeing how different political figures affected the discussion on climate change. For example, how did the language shift while the president was a part of the republican party vs. when they were a part of the democratic party. It would also be interesting to see how this discussion differs among other countries as well.

Important Hyperlinks

- GitHub
- Google Slides
- Jupyter Notebook
- NYT Articles CSV
- NYT Article Count CSV

References

- NYT Archives
- Newspaper3k Instructions
- Global Temperature Graph
- Importing csv files into Jupyter Notebook
- Climate Change Timeline
- Word Cloud Tutorials
- Word Cloud Colors

Students
- Chloe Akazawa DIGHUM 100 Summer 2020 Jupyter Notebook
- Daniel Dang DIGHUM 100 Summer 2020 Jupyter Notebook
- Eric Dratva DIGHUM 100 Summer 2020 Jupyter Notebook

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