U.S. Public Opinion on the Relevance of Global Climate Change: The Influence of Local Natural Disasters

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Abstract

This thesis explores how the occurrence of a natural disaster impacts U.S. public opinion on the relevance of environmental issues in the country, examining data at both the state and national level. It finds that natural disasters do not have a strong impact on individual's beliefs on whether the environment is the most important problem facing the country today, suggesting that there is not a correlation between the two variables. In fact, consistently throughout models, whether the disasters affect more people, cause more deaths, or are measured state or nationwide, there is a statistically insignificant relationship between opinion and disasters. On the other hand, results discovered that certain demographic factors make an individual more likely to see climate change as a top priority. Specifically, being of a younger age, higher education, or left-leaning ideology has a significant influence on opinions and leads one to see the urgency of environmental issues. Gender and income do not change one's opinion in this manner and do not show a correlation. This lack of a relationship between natural disasters and public opinion leads to the conclusion that individuals may worry about other issues more than the environment after disasters, such as healthcare and unemployment. It could also mean that there needs to be more education on the relationship between natural disasters and climate change.

Introduction

While walking through a burned forest or flooded house, one may hope for something positive to come out of the devastation. “After Fires and Floods, A Glimmer of Hope” is a powerful article in the New York Times, showing that even a group with as much might as the New York Times Editorial Board has dreams for natural disaster improvements (The New York Times Editorial Board, 2020). The theory is that after disaster-caused destruction strikes, people will change their attitudes and strive for a better future that reduces damages. This could include a future that tackles climate change. Scholarly studies support this concept and explain how public opinion in the United States can reshape policies from the local to international level.

However, this thesis questions whether there is a cause for hope as it analyzes what effect natural disasters have on how individuals in the United States prioritize climate change and environmental issues. In fact, it seems that there could be cause to abandon these hopes, for this thesis discovers that natural disasters do not have a strong impact on individuals’ beliefs in this manner, and there is no statistically significant relationship between the two variables. The results are similar whether the disaster impacts a larger number of people, causes a higher number of deaths, or is studied at the nationwide or local level. Instead, demographics have a stronger correlation with opinions. For example, those of a younger age, higher education, or left-leaning ideology are more likely to view climate change as a top priority. In order to show this analysis, this paper will start by explaining the relationship between climate change and natural disasters. Then it will examine theories on disaster events, demographic factors, and their impacts on opinions. In particular, the paper will review the agenda-setting theory and how it would describe public opinion on the topic. Next, this paper will evaluate data on the lack of a

correlation between disasters and U.S. public opinion on climate change. To finish, the conclusion will include further research suggestions and future policy analyses, specifically looking at the influence news media may have on disaster opinion and policies.

Key Concepts

Dependent variable: A Gallup survey's question asking whether an individual views the environment as the most important problem facing the United States today.

Independent variable: The number of natural disasters at both the state and national level. This study will also look at the number of people affected and killed by natural disasters.

Public opinion on the environment: This variable will look specifically at public opinion on the question of "what is the most important problem facing the United States today?" This is a question that asks respondents to state what they view as the most important issue, and one of the categories for responses is "Environment-Pollution".

Natural disasters: Specifically, the EM-DAT database describes this as "An unforeseen and often sudden event that causes great damage, destruction and human suffering. Though often caused by nature, disasters can have human origins" ("EM-DAT Glossary", n.d.). This thesis will focus on the natural disasters that studies say have increased in frequency and/or intensity due to climate change, such as hurricanes and wildfires.

Climate change: The Intergovernmental Panel on Climate Change describes climate change as "A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer" (Field et al., 2012, p.5). The variable that measures public

opinion in this thesis examines whether respondents see the environment as the most important problem in the U.S., and within that category, climate change is the specific environmental problem that causes variations with natural disasters. Therefore, while climate change is not specifically mentioned in the research question, it has a clear connection to the topic.

Background

2020 set records as California's largest wildfire season with the burning of over 4.2 million acres (State of California, 2020). In the same year, there were 30 named tropical storms and 12 landfall storms on the opposite coast of the country, creating the busiest hurricane season on record (National Oceanic and Atmospheric Administration, 2020). This is a part of a general theme both in the United States and across the globe, for rising global temperatures has led to an 83% increase in the number of climate-related natural disasters in the last 20 years (Yale School of the Environment, 2020). Not only will the number of events increase and change in the future, but also the special extent, duration, and timing (Field et al., 2012). Thus, there are concerns in the past few decades that as climate change progresses, so does the intensity and frequency of natural disasters.

Though countries emit greenhouse gases all over the planet, the United States has a particularly influential role. It is the second-highest contributor to carbon dioxide emissions in the world, accounting for roughly 15% of worldwide emissions (Environmental Protection Agency, 2020). This is especially problematic considering the country's relationship with international climate change agreements as it did not ratify the 1997 Kyoto Protocol and briefly pulled out of the Paris Agreement in 2020 (Congressional Research Service, 2020). All in all, the United States is a

significant player in the efforts to combat climate change and the subsequent natural disasters; yet there is often a lack of strong international action by the U.S. on this issue.

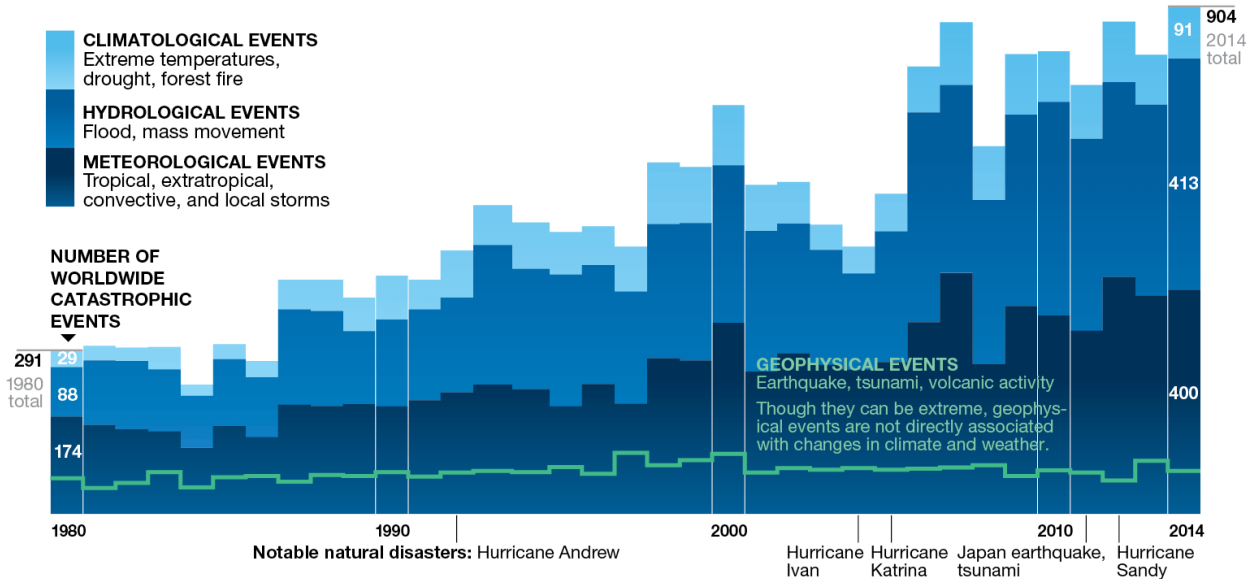
The public opinion of U.S. citizens can affect how the country reacts to climate change. Citizens and their opinions direct the actions of government officials through their voting habits and businesses through their buying habits. Furthermore, studies suggest that public opinion influences the foreign policy decision-making of U.S. presidents (Foyle, 1997). Therefore, it is useful to investigate factors that may influence this decision-making, such as the occurrence of natural disasters, in order to help researchers better understand elements that could eventually sway the United States' actions on climate change. Public opinion is the focus of this paper for this reason.

The Relationship Between Climate Change and Natural Disasters

In general, the relationship between climate change and natural disasters is that increased levels of greenhouse gases are linked to an increase in extreme weather events (Anderson & Bausch, 2006). For example, heatwaves, flooding, and droughts in certain areas of the world will be more common, and windstorms and hurricanes will be more intense (Anderson & Bausch, 2006). The spatial extent, duration, and timing of extreme weather and climate events will also be different, and evidence of these changes is drawn from sources that go back to 1950 (Field et al., 2012). Furthermore, anthropogenic influences such as the increased release of greenhouse gases in the atmosphere lead to these variations in extreme weather (Field et al., 2012).

There are also studies explaining that certain natural disasters are more likely to be influenced by climate change than others. The disasters that are most commonly associated with climate

change include heat waves, floods, hurricanes, wildfires, and droughts, all of which are weather or climate-related disasters (Heyck-Williams, 2019; NASA, 2005). Meanwhile, earthquakes, tsunamis, volcanoes, and other geophysical disasters are not directly affiliated with weather, so these disasters do not tend to be associated with climate change (EM-DAT, n.d.; PennState Department of Geography, n.d.).



(National Geographic, n.d.)

Literature Review

Public opinion on climate change may vary for a variety of reasons. Events such as the Great Recession in 2008, and the film “The Inconvenient Truth” in 2006 can influence public opinion on climate change along with demographics, political leanings, and economic indicators such as unemployment and inflation rates (Egan & Mullin, 2017). In terms of this thesis, studies have shown that exposure to extreme weather events tends to produce meaningful, but short-lived shifts in climate change opinions (Konisky et al., 2016).

The following literature review examines how theories and previous scholarly work evaluate the relationship between natural disasters and public opinion. This will set up the hypotheses and data analysis of this paper's research question, "What effect do natural disasters have on U.S. public opinion on the urgency of climate change and environmental issues for the country?" First, the review will examine how the agenda-setting theory and previous U.S. studies analyze the correlation between weather events and opinion. Then it will explore how demographics could weaken and/or shift this relationship.

Disaster Events and Agenda-Setting

Agenda-setting is a popular theory that can explain how opinions on the environment change after the occurrence of a natural disaster. It theorizes that sudden and rare focusing events are a window of opportunity for policy discussions and change, including in the case of significant natural disasters (Birkland & Schwaeble, 2019). Previous scholarly work on public opinion and disasters falls in line with this theory and tends to focus on one short-term event or one type of weather. For example, hurricanes can lead to shifts in opinion, for a study on Hurricane Irma discovered that negative opinions of climate change grew in the aftermath of the storm (Berguist et al., 2019). Meanwhile, in New Jersey, research found that more individuals showed pro-environmental attitudes after Hurricanes Irene and Sandy (Rudman, 2013).

When climate and opinion research is long-term, it often observes one specific weather-type, such as temperature. For example, multiple articles in the U.S. discovered that fluctuations in temperatures lead to an increase in individuals that believe in global warming (Egan & Mullin, 2012; Joireman, 2010). It is not as common that studies in the U.S. give a more comprehensive

review of multiple disaster types. One U.S. study that did examine a wider variety of disasters over a longer period evaluated opinion through social media, discovering that Twitter mentions on climate change increased after each event (Sisco, 2016). However, social media may not be an accurate representation of the average American's opinion. In general, extreme weather likely leads to heightened risk perceptions of climate change (van der Linden, 2015). Still, it is important to note that the literature suggests a shift in opinions and an increase in agenda-setting after weather events and natural disasters. It is also common that this shift in opinion leads to higher risk perceptions of climate change and the state of the environment.

Demographics

There is simultaneously the argument that outside factors could influence public opinion more heavily than the disasters themselves. This would mean that demographics influence opinions more than the events that lead to agenda-setting. For example, a 2020 study on California wildfires found that Democratic-voting areas tended to have increased pro-environmental voting behaviors after wildfires while Republican-voting areas did not (Hazlett & Mildenberger, 2020). Furthermore, some studies find that older people are more resistant to the concept of climate change than younger people, but results can be mixed (Egan & Mullin, 2017). One 2018 study by Gallup, the database used in this thesis, found that younger generations, such as people under 35, often view climate change as a more serious issue than those of an older age (Reinhart, 2018). In fact, these two variables may influence one another, for the gap in beliefs between generations is partially attributed to the fact that younger generations in the U.S. are more often associated with the Democratic party (Reinhart, 2020). Lastly, the general idea here is that

people who believe in the occurrence of climate change are more likely to favor natural disaster policies in the United States (MacInnis & Krosnick, 2020).

Other demographic variables on climate change and public opinion are a bit more difficult to analyze. One study explains that civic engagement, communication, and higher education are considered the most important predictors on whether someone in the U.S. is aware of climate change (Lee, et. al., 2015). Another paper based in Portland and Houston found that those with a higher level of education were more likely to change their behavior towards addressing climate change (Semenza, et. al., 2008). However, the analysis on education relates to an individual's political views. For example, a higher level of education is correlated with greater risk perceptions on global warming for Democrats and liberals but lower risk perceptions for Republicans and conservatives in the United States (Lee, et. al., 2015).

The story is also unclear with income, for those of lower income may be more likely to see climate change as a threat (Lee, et. al., 2015). In an examination of Hurricane Katrina, it was found that pre-existing socio-economic conditions, such as low income, made certain individuals more vulnerable during the response and recovery phases of the storm (Mazosera, et. al., 2007). However, income is also often associated with educational levels, in which people from a low-income family are less likely to continue on to receive a higher education after high school (Dedman, 2018). This conflicts the story, for those with a lower education may not understand the relationship between the natural disasters and climate change. One study even explains that a higher income led to higher support for climate change mitigation policies (Schwom, et. al., 2009). Therefore, with demographic qualities such as education and income, it can be unclear at times their true impact on climate change public opinion. Yet, it must be noted that a higher

education, regardless of political affiliation or income, does tend to be associated with a higher likelihood that individuals see the risk of climate change.

Lastly, gender is another demographic explored in climate change opinion research. In general, it appears that women show both more knowledge and more concern on climate change than men (McCright, 2010). The Portland and Houston study previously mentioned similarly finds that women in both cities are more likely to see climate change as a threat (Semenza, et. al., 2008). Women also have slower recovery times to disasters and tend to be more vulnerable to their impacts (Saleh Safi, et. al., 2012; Masozera, et. al., 2007). All in all, it seems that women are more likely to understand the high risk of climate change than men.

Through examining the above information, one can conclude that demographic factors may be a major decisive tool in risk perceptions of the environment and climate change, and it could be the case that demographic factors have as much power as the disaster event in deciding one's perceptions on climate change. Therefore, it is important to include these demographics in studies about public opinion. Proceeding forward, something that would aid the literature gap would be an increase in studies that include a variety of natural disasters, a high frequency of observations over a long time period, and the analysis of multiple demographic factors. This is a more holistic approach, because short-term research or work that only analyzes one type of weather cannot extrapolate their results to a variety of disasters. Trends may change and differ for new disasters not directly included in those studies. Moreover, the inclusion of demographic factors in analyses lets one compare their influence to the disasters' impact, allowing researchers to decide whether one has a stronger impact than another. This paper will include all of these factors in order to address this literature gap.

Theory

As seen in the literature review, studies on natural disasters lead to a few arguments. For one, it suggests that natural disasters change opinions on the environment. For example, studies found that natural disasters such as Hurricane Irma led to either heightened risk perceptions or increased Twitter mentions on climate change. Therefore, after a natural disaster, public opinion focuses more on this issue. This leads to the conclusion that people would also be more focused on the environment as the most important problem in the United States.

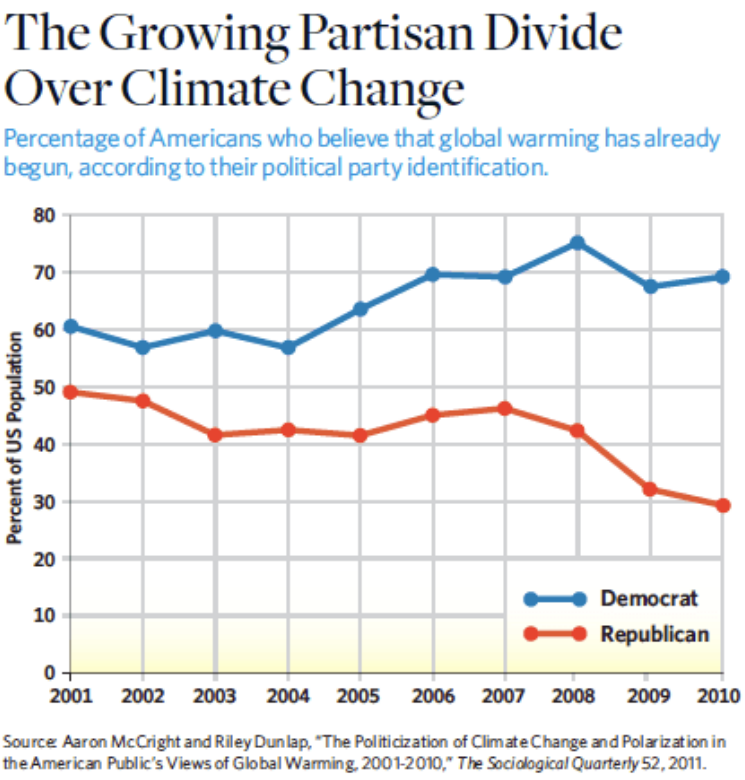
Furthermore, weather-related disasters are the type of disasters most commonly associated with increasing in intensity and frequency with climate change. This means that geophysical or biological disasters, which are caused by diseases or hazards from solid earth, are less likely to change in behavior due to climate change. Because this thesis is exploring the disasters that would be viewed as an "environmental problem" related to climate change, the focus of this thesis will be the weather-related disasters such as hydrological, climatological, and meteorological disasters.

The literature also suggests that those directly impacted by a natural disaster are more likely to have their opinion change. This is due to the fact that the studies in the literature often research only the opinions of those who experienced the disaster, implying that the people living in a state hit by a disaster are more likely to have their opinion change than those not hit. Therefore, those in a state hit by a disaster would be more likely to have opinions change after the disaster than those living in another state because they are more likely to feel the disaster's direct impacts.

However, the agenda-setting theory simultaneously explains that any significant and rare event could lead to policy discussions and change. This could mean that even those who do not

experience the event but hear about its significance in the news may shift their opinions on natural disasters. The occurrence of more disasters nationwide and not just within a state could therefore change opinions on the urgency of climate change. Due to these competing theories, this paper will compare state and nationwide reactions to natural disasters.

There are studies providing evidence that certain demographics are more likely to react to natural disasters than others. For example, research suggests that older, less educated, and more conservative people are less likely to view climate change as an issue. Since they are less likely to see climate change as an issue, they may not make the connection between climate change and natural disasters. They may also be less likely to see the environment as the most important problem facing the United States. The opposite could be true for younger individuals, educated people, women, and Democrats.



(McCright and Dunlap, 2011; Hoffman, 2012)

Lastly, income is a variable that may impact one's view on the relevance of the environment. However, the story for income is not straightforward. In particular, people of low income would be more vulnerable to the environmental hazards of climate change, such as natural disasters. This would lead to the theoretical conclusion that their opinions on the environment would view the environment as a top priority. However, literature also suggests that a higher education, which tends to be associated with wealth, is also correlated with greater climate change risk perceptions. A sizeable income could also mean that concerns that trump the environment, such as the economy or healthcare, are not a great concern, because the wealthy have the finances to handle those costs. Therefore, the environment would be listed higher than these issues. This leads to the opposite theoretical conclusion, that the environment is the most important problem for wealthy individuals. All in all, one cannot clearly deduce income's impact from studying the literature.

Hypotheses

Hypothesis 1: The occurrence of a natural disaster in a state will lead to a higher likeliness that individuals list the environment as the most important problem.

This is the main hypothesis of the thesis. The other potential hypotheses listed below are secondary to this main one. Note that this hypothesis will be analyzed on two levels: (1) the state level number of disasters and (2) the national number of disasters. Furthermore, the hypothesis predicts that there will be more people who view the environment as the most important problem because studies have historically shown a similar shift towards increased concerns about the environment after natural disasters or weather fluctuations.

Hypothesis 2: Respondents of a younger age will be more likely to list the environment as the most important problem.

Hypothesis 3: Respondents that are left leaning will be more likely to list the environment as the most important problem than those that are right leaning.

Hypothesis 4: Women will be more to list the environment as the most important problem than men.

Hypothesis 5: Income will have no impact on whether an individual views the environment as the most important problem.

Hypothesis 6: Those of a higher educational level will be more likely to view the environment as the most important problem.

Hypothesis 7: The higher impact that a disaster has, the more likely that an individual will view the environment as the most important problem.

Hypothesis 2 is based on the literature that notes that older people are less likely to see the importance of climate change. Hypothesis 3 is based on the literature explaining how Democratic areas would change towards pro-environmental voting patterns after California wildfires while Republican areas would not. Hypotheses 4 and 6 similarly follow from the conclusions in the Literature Review and Theory sections of this paper. Meanwhile, income, the focus of Hypothesis 4, is theorized to have no impact due to the fact that conclusions on its influence are inconsistent and may even cancel one another out. Lastly, Hypothesis 7 is based on the agenda-setting theory. This theory discusses how significant and rare events would lead to policy

discussions and change. Therefore, it is theorized that events that are more significant, i.e., those that affect more people and cause more deaths, would be more likely to generate conversations around climate change policies because they are more "significant" and/or "rare" than the average storm or smaller storms.

To test my hypotheses, I will look at respondent-level, monthly polling on public opinion along with data on the state-level and national-level occurrence of a natural disaster. The idea will be to examine the number of disasters that impacted individuals in the U.S. a specific month and year. I will analyze the changes within each state and throughout the nation month by month in order to examine the effect that natural disasters have on public opinion.

Databases

EM-DAT: For information on natural disasters, I am using EM-DAT data. This data gives the full list of natural disasters occurring in the United States from 2000-2020. Specifically, it lists the type of disasters that have occurred (tropical cyclone, forest fire, ground movement, flash flood, convective storm, etc.). Within that variable, the dataset also explains whether convective storms are tornados, winter storms, thunderstorms, hail, or something else. The dataset lists all areas and states impacted by the natural disaster along with the total number of people affected, deaths, and cost in U.S. dollars of the damages. Lastly, it gives the day, month, and year of the start dates and end dates of each natural disaster. The dataset originally included disasters that are not weather-related, specifically geophysical and biological disasters. However, these were removed to focus on the hydrological, meteorological, and climatological disasters, all of which are weather-related and associated with climate change.

GALLUP POLL SOCIAL SERIES: For public opinion data, I am using the Gallup Poll Social Series, which is a monthly, themed series at the respondent-level in the United States. For every month excluding December from 2000-2020, the poll asks the question "What do you think is the most important problem facing the United States today?" to respondents. Their answers are categorized into sections such as "Economy", "Iraq", or "Environment-Pollution". Furthermore, the dataset asks respondents questions about their age, income, gender, marital status, political affiliation, education level, state, zip-code, and more. It also provides the exact day, month, and year that a respondent was polled.

Methods

Data was tested on Stata using both logit models and the reghdfe command. A logit model is ideal because it is able to test binary variables, which is the type of variable used to measure whether an individual views the environment as the most important problem. Meanwhile, the reghdfe command allows one to examine binary variables and multiple fixed effects directly and simultaneously. This thesis will look at tables using the logit commands; however, one can refer to the appendixes to find the same regressions using reghdfe (Appendix A). Findings do not differ much between the two regression commands. The unit of analysis of the data is the individuals in a specific U.S. state, month, and year at the state level. At the national level, the thesis examines the individuals throughout the United States in a specific month and year.

With the assumption that Y is a binary variable and that the betas are coefficients to the variables; the basic form of the models in this essay will look like this:

$$Y = T^{FE} + S^{FE} + \beta_1 Disaster + \beta_2 Age + \beta_3 Education + \beta_4 Gender + \beta_5 Income + \beta_6 Ideology + e$$

Dependent Variable, Y: Whether a respondent in a particular month and year views the environment as the "most important problem facing the U.S. today." For example, the public opinion of an individual in July 2015. With the logit/probit model, we will be looking at the probability of Y being equal to 1.

- 0= Individual does not view the environment as the most important problem
- 1= Individual views the environment as the most important problem.

Fixed Effect variables: Time (T^{FE}) (measured by month and year) and U.S. State (S^{FE}).

Independent Variable, X: The number of natural disasters both statewide and nationwide in a particular month and year. For example, 3 disasters occurred in California in July 2015, and 5 disasters occurred in the U.S. in July 2015. This is above as β_1Disaster and β_1 is the coefficient to the variable.

The other variables in the equation look at the age, gender, income, education, and political affiliation of individuals in a particular month, year, and state. These variables will be added to test hypotheses 2-6. These variables are measured by the Gallup Poll Social Series mostly as continuous variables. The age variable is continuous and accounts for all ages of respondents. The gender variable labels male as equal to 1 and female as equal to 2. Education is listed into four categories: "HS or less", "Some College", "College Grad only", and "Post-grad". Similarly, ideology is listed into 5 categories: "Very Conservative" "Conservative" "Moderate" "Liberal" and "Very liberal".

Income -- Full Categories
Less than $10K
$10-$20K
$20-$30K
$30-$40K
$40K-$50K
$50-$75K
$75K-$99k
$100K-$149K
$150k-$249K
$250k-$499k
$500K and over

Income has 11 categories, listed to the right. Lastly, there is an error term (e) in the equation that can account for information on outliers.

This data will be observed on two levels: the state-level and national-level. At the state-level, the numbers on natural disasters will only refer to disasters occurring within that state and will be during a specified month and year. Furthermore, the analysis will look at the data in the months immediately before a natural disaster in order to see any changes more directly. This will ensure that if changes in public opinion only occur in the few months following a disaster, but revert back to some average later on, then that immediate impact of the natural disaster on public opinion will still receive observation.

In terms of nation-level data, there is a variable that examines how many natural disasters occurred in the entire country in a particular month and year. This will help this essay analyze whether individuals react to experiencing a disaster, as will be measured by looking at the state-level data, or if they react due to hearing about the disaster from far away on the news or through other sources, as seen through nationwide data. Note that all individuals within a state may not directly experience the disaster but, nonetheless, are in closer proximity to it than other states in the country.

Also, this thesis analyzes all of the natural disasters listed as Meteorological, Hydrological, or Climatological in EM-DAT. Geophysical and Biological disasters, such as earthquakes, volcanic eruptions, and epidemics, will not be included in the analysis of data, because these disasters are not weather-related, and therefore, not closely associated with climate change.

Lastly, data will be from 2000 to the beginning of 2020 (the first 3 months), because the datasets are within these years, and global warming had entered the United States as a topic of conversation by 2000.

Analyzing the Data: With the logit/probit model, a positive coefficient to the variables means that the Y variable increases in likeliness with the corresponding X variable, and a negative coefficient means that the Y variable decreases in likeliness when the X variable increases. Hypothesis 1 would be supported by a positive and statistically significant coefficient next to the X variable of the occurrence of a natural disaster. Meanwhile, the hypothesis will be falsified with a negative and statistically significant coefficient. Furthermore, coefficients that are not statistically significant will not properly support the hypothesis either.

For Hypothesis 2, the coefficient will need to be negative and statistically significant. If it is positive and statistically significant or is not statistically significant, then Hypothesis 2 will not be supported. For Hypotheses 3, 4, 6, and 7 the coefficients for the variables on political affiliation, gender, education, total affected, and total deaths need to be positive and statistically significant. If the coefficient is negative or not statistically significant, then these hypotheses will not be supported. Lastly, Hypothesis 5 on income is not supported if the coefficient is positive or negative and statistically significant, for that would suggest that income has an impact on opinions on the environment.

The empirical results will speak to the theoretical questions asked by showing the relationship between the X and Y variables. If there is a positive and statistically significant relationship between the probability of Y and the variables of natural disasters, political affiliation, gender, education, total affected, and total deaths then it means that natural disasters, being a Democrat,

being a woman, having a higher education, and higher impact disasters lead to a higher likeness that an individual sees the environment as the most important problem in the United States. The same logic applies to the age variable, except that a negative coefficient is hypothesized. This coefficient would mean that the older an individual is in age, the less likely it is that they will see the environment as the most important problem. Lastly, when looking at state-level data, any changes in public opinion would need to appear after the occurrence of the disaster and, for the state-level analysis, should be in the state(s) where the disaster happened rather than other areas. That way one can more directly attribute any changes to the disaster itself.

Data Organization: To give a sense of how the data is organized, the finalized dataset lists the number of the hydrological, meteorological, and climatological disasters that each individual in the public opinion dataset experienced. For example, the main variables are the individual, their state, the month and year they were surveyed, their opinion on if the environment is the most important problem, their demographics, and the number of disasters they experienced. There is also information for the total number of people affected and total deaths from the disasters in a specific month and year, and the three months after an individual was surveyed. Providing this information allows one to see if disasters with a higher impact change public opinion differently than those with a lower impact. It is also useful to look at the months before individual was surveyed in case an individual was surveyed before a disaster occurred in the month and date of the survey. That way there is a more accurate representation on whether the individual experienced a disaster or not. It also allows one to see how long the impacts of a disaster may last.

Furthermore, the total affected and total deaths variables are the logarithmic versions of the variables, rather than the numbered count of individuals that died or were impacted. It is preferable to use logarithms in this scenario because of the magnitude of these variables compared to the other variables in this study.

Once again, note that the variables on the number of disasters, total affected, and total deaths are measured at the both state-level and nation-level. At the state-level, this is the number of disasters, deaths, and people affected in a state during a specific month and year. For example, this level of analysis would explain that 2 natural disasters occurred in California in June 2015. At the nation-level, this is the number of disasters, deaths, and people affected across the country during a specific month and year. For example, this level of analysis would say that 6 natural disasters occurred in the United States in June 2015.

Models

To begin, the first model tested is the basic relationship between the environment and the occurrence of a natural disaster within a state at a specific month and year. It controls for the demographic factors that could influence opinions.

Model 1: Y (Opinion on the Environment) = Time (month/year) Fixed Effect + State Fixed Effect+ β_1(The Occurrence of a Disaster the month of the survey) + β_2Age+ β_3Education + β_4Gender + β_5Income + β_6Ideology + e

Next, the below table is the same as Model 1, but it examines the data on natural disasters that occurred over three months. These three months are the two months before the survey and the month of the survey.

Model 2: Y (Opinion on the Environment) = Time (month/year) Fixed Effect + State Fixed Effect+ β_1(Number of Disasters in the 3 Months before the survey) + β_2Age + β_3Education + β_4Gender + β_5Income + β_6Ideology + e

Now, the models examine national data, in case that those watching the news from other states react differently to the disasters than those that were directly impacted within the state. Specifically, this variable examines how many total disasters occurred across the United States during a specific month and year. Note that the fixed effects for time on nationwide variables control for month and year separately instead of together as a particular month in a specific year.

Model 3: Y (Opinion on the Environment) = Time (month and year, separately) Fixed Effect + State Fixed Effect + β_1(Number of Disasters Nationwide in the month of the survey) + β_2Age + β_3Education + β_4Gender + β_5Income + β_6Ideology + e

Model 4: Y (Opinion on the Environment) = Time (month and year, separately) Fixed Effect + State Fixed Effect+ β_1(Number of Disasters Nationwide in the 3 Months before the survey) + β_2Age + β_3Education + β_4Gender + β_5Income + β_6Ideology + e

Table 1: Impact of the Number of Disasters on Environment Public Opinion

	Model 1	Model 2	Model 3	Model 4
Environment				
Natural Disasters, State-level (month of survey)	0.0331			
	(0.66)			
Natural Disasters, State-level (last three months)		0.0274		
		(0.98)		
Natural Disasters Nationwide (month of survey)			0.00486*	
			(2.04)	
Natural Disasters Nationwide (last three months)				-0.000502
				(-0.33)
Gender	-0.0591	-0.0592	-0.0616	-0.0614
	(-1.24)	(-1.24)	(-1.30)	(-1.29)
Age	-0.0117***	-0.0117***	-0.0117***	-0.0116***
	(-8.54)	(-8.54)	(-8.53)	(-8.53)
Education	0.333***	0.333***	0.331***	0.332***
	(13.14)	(13.14)	(13.12)	(13.12)
Income	0.0173	0.0172	0.0156	0.0156
	(1.50)	(1.49)	(1.36)	(1.36)
Ideology	0.809***	0.809***	0.807***	0.808***
	(33.18)	(33.18)	(33.24)	(33.26)
N	155838	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001	

Finally, information examining the total affected and total deaths are included in order to examine whether these variables impact how individuals view the environment. It may be the case that they are a better representation of how individuals respond to natural disasters than listing the number of disasters. These are observed at both the state level and nationwide level of analyses.

At this point in the study, the focus is on the disasters in the last three months, because it is small enough time for an individual to still have the disasters in their recent memories, but a long enough time for the data to better represent the number of disasters that an individual recently experienced. The latter point alludes to the fact that individuals may have been surveyed before a natural disaster occurred in the specific month and year, so examining the previous months may be a better example of the true number of disasters that impacted them. For more detailed information about the code for these models, see Appendix A.

Model 5: Y (Opinion on the Environment) = Time (month/year) Fixed Effect + State Fixed Effect + β_1(State Number of Disasters in the last 3 Months) + β_2(State Total Deaths by Disasters in the last 3 Months) + β_3(State Total Affected from Natural Disasters in the last 3 Months) + β_4Age+ β_5Education + β_6Gender + β_7Income + β_8Ideology + e

Model 6: Y (Opinion on the Environment) = Time (month and year separately) Fixed Effect + State Fixed Effect + β_1(National Number of Disasters in the last 3 Months) + β_2(National Total Deaths by Disasters in the last 3 Months) + β_3(National Total Affected from Natural Disasters in the last 3 Months) +β_4Age + β_5Education + β_6Gender + β_7Income + β_8Ideology + e

Model 7: Y (Opinion on the Environment) = Time (month and year separately) Fixed Effect + State Fixed Effect + β_1(State Number of Disasters in the last 3 Months) + β_2(State Total Deaths by Disasters in the last 3 Months) + β_3(State Total Affected from Natural Disasters in the last 3 Months) + β_4(National Number of Disasters in the last 3 Months) + β_5(National Total Deaths by Disasters in the last 3 Months) + β_6(National Total Affected from Natural Disasters in the last 3 Months) + β_7Age + β_8Education + β_9Gender + β_{10}Income + β_{11}Ideology + e

Table 2: Impact of Number of Disasters, Total Affected, and Total Deaths on Environment Public Opinion

	Model 5	Model 6	Model 7
Environment			
Natural Disasters, State-level (last three months)	0.125**		0.110**
	(3.03)		(2.76)
Total Deaths, State-level (last three months)	-0.0681*		-0.0507
	(-2.25)		(-1.74)
Total Affected, State-level (last three months)	-0.0123		-0.0150
	(-1.21)		(-1.58)
Natural Disasters Nationwide (last three months)		-0.000805	-0.00195
		(-0.45)	(-1.02)
Total Deaths Nationwide (last three months)		0.00893	0.0175
		(0.33)	(0.64)
Total Affected Nationwide (last three months)		-0.00183	0.00196
		(-0.22)	(0.23)
Gender	-0.0580	-0.0615	-0.0604
	(-1.22)	(-1.29)	(-1.27)
Age	-0.0117***	-0.0116***	-0.0116***
	(-8.54)	(-8.53)	(-8.53)
Education	0.333***	0.332***	0.332***
	(13.15)	(13.12)	(13.13)
Income	0.0170	0.0156	0.0153
	(1.47)	(1.35)	(1.33)
Ideology	0.809***	0.808***	0.808***
	(33.18)	(33.26)	(33.26)
N	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001

Results and Analysis

Hypothesis 1: Number of Disasters

To begin, this data does not support Hypothesis 1. This is because there is an inconsistency in results leading to the conclusion that the occurrence of a natural disaster does not cause an increase in concern for the environment. At the state-level with demographic controls, a disaster has no statistically significant impact on opinions, whether it is the number of disasters within that month or over the last three months (Model 1, Model 2). Once one accounts for total deaths and total affected in the regressions in Models 5 and 7, there is positive coefficient and statistical significance at the $p<0.01$ level, but the relationship is not very strong.

At the national level, the story changes. The coefficient in Models 4, 6, and 7 are all statistically insignificant. Only Model 3, which examines the national number of disasters the month of the survey, shows a positive and statistically significant response ($p<0.05$), but the coefficient is small. All of this suggests that when a natural disaster occurs anywhere in the country, individuals in the U.S. do not change their opinions on the environment as the most important problem.

This can lead to multiple interpretations. For one, when people see that environmental destruction caused by climate change is occurring in the nation, there is only weak and minimal evidence showing that public opinion views the environment as the top priority of the nation in the following months. In fact, it appears that there is not truly a relationship between the two variables at all. There are multiple reasons that this could be occurring. It is possible that other concerns top the environment after a disaster. For example, maybe the immediate economic

consequences are considered a top priority instead of climate change. Perhaps the environment is a higher concern in general, but it never reaches the point of becoming what individuals consider the top priority in the United States that month. Individuals also may not understand the direct relation between the environment and the occurrence of the natural disaster, prompting them to not understand why one would list the environment as a problem after disasters.

Hypothesis 2: Age

Age has a more consistent impact on one's view on the environment in these findings. Throughout Models 1-7, age has a negative coefficient that is statistically significant at the $p<0.001$ level. This means that individuals of a younger age are more likely to view the environment as a top concern. These disasters may occur nationally, they may experience it themselves, they may be a summation of the last several months, and still a younger individual will be more likely to view the environment as the most important problem.

There are many theories to why this result is occurring. First of all, these individuals are more likely to feel the impact of climate change throughout their lifetimes. This is due to the fact that climate change is a more recent topic, for global warming only became a public talking point around 1988, and it will be a problem continuing into the future (Egan & Mullin, 2017). In general, older individuals will not have to experience a lifetime of impacts from climate change like younger individuals will. However, it could also be the case that younger individuals happen to have more education on the connection between climate change and events such as natural disasters.

Hypothesis 3: Political Affiliation

Political affiliation's results are consistent, similar to age. Hypothesis 3 is strongly supported by the data, for ideology routinely has a positive coefficient that is statistically significant at the $p<0.001$ level. In this data, the scale of ideologies goes from 1 to 5, with 1 as very conservative and 5 as very liberal. Therefore, these results suggest that the more liberal an individual is, the more likely they will view the environment as a priority.

The reasoning for this result is likely straight forward. While both left-leaning and right-leaning individuals have historically supported efforts on the environment, when it comes to climate change, the story is different. Left-leaning individuals and their parties, such as the Democrats, tend to support climate change mitigation efforts more often than right-leaning individuals and republicans (Dunlap & McCright, 2008). Furthermore, right-leaning individuals are also less likely to believe in climate change and its science (Dunlap & McCright, 2008). This means that they may not see its importance and the current urgency associated with environmental issues.

Hypothesis 4: Gender

Gender's impact was not predicted. In all 7 models, the coefficient to gender has no statistical significance. This means that gender does not have an impact on people's opinion of the environment. This does not support Hypothesis 4, which theorizes that women would be more likely to believe the urgency of environment issues than men.

The reasoning for this result is that other demographic factors, such as some of the ones used in this study, cause differences in opinions instead. One does not heavily use the historical and

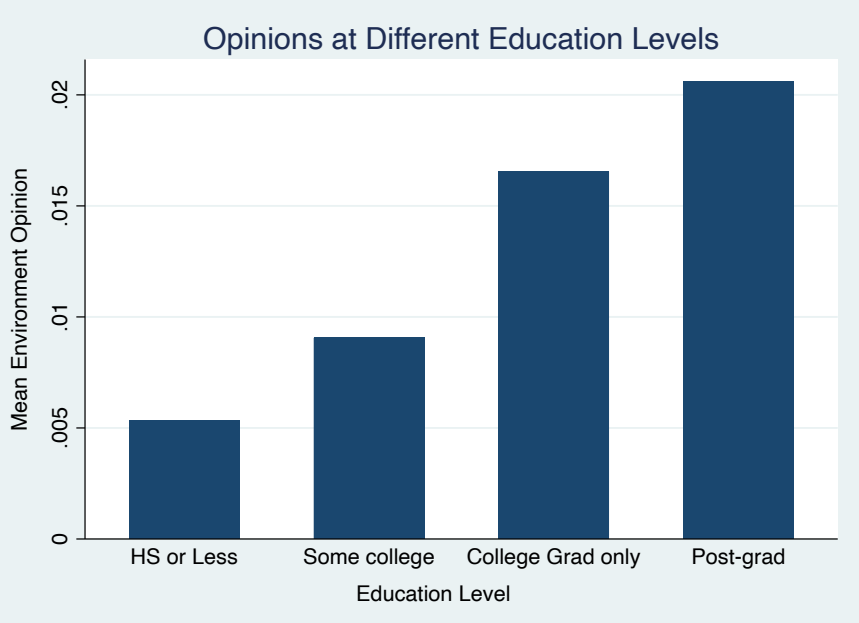
societal circumstance surrounding their gender to decide their beliefs on the environment according to this data. Furthermore, the fact that women are more vulnerable to climate change weather events does not impact results. However, it is important to note that this study only looks at the male and female genders, and not at non-binary individuals or other genders. It is plausible that the inclusion of more genders could change these conclusions.

Hypothesis 5: Income

Hypothesis 5 theorized that income would not have an impact on one's view on the environment. The models with fixed effects on both year and month display a similar story and support Hypothesis 5 for none of the coefficients are statistically significant, suggesting that there is not a relationship between income and beliefs on climate change. This means that as one's income rises or falls, they are not more likely to see the environment the most important problem in the country.

This finding is particularly of interest because several conclusions could be made. Individuals with a lower income could be hypothesized to suffer more from environmental issues such as an increase in natural disasters, and thus see the environment as a top priority. This would suggest a negative relationship between income and opinions on the importance of the environment. However, it is possible that these lower income individuals either do not have a high-level education that informs them about the risk of environmental problems or are more concerned about other issues such as healthcare or the economy. The latter point assumes that their health or finances are impacted by environmental issues.

Meanwhile, those of a higher income may not feel the economic, healthcare, or other burdens of climate change. This could prompt the wealthy to see the environment as a primary concern over other issues, for they have the funds to combat it. However, it could also cause them to not care too much for environmental issues, for they did not endure much aftermath and impacts of occurrences such as climate change and natural disasters. Lastly, it may also simply be the case that income status has no impact on how one views the environment, and the factors discussed above do not strongly influence opinions. All in all, it is difficult to discern the reasons that income does not have an impact, but there are some theories.



Hypothesis 6: Education

Education is consistently positive and statistically significant at the $p<0.001$ level in every model, showing that as education rises, the more likely it is that an individual sees the importance of the environment. This supports Hypothesis 6.

The likely reasoning behind this result is that not only do these individuals understand the risks associated with environmental issues and climate change, but also understand complex environmental concepts such as relationship between climate change and disasters. Knowledge on the high risk of climate change allows one to grasp why it could be considered a higher priority than other issues such as the economy, for one would understand that other issues such as the economy will worsen if climate change isn't addressed. Thus, those of a higher educational level may be more likely to view the environment as a priority for this reason.

Hypothesis 7: Impact-Level

Hypothesis 7 has several levels. One can analyze both the total number of deaths and total affected in order to support or falsify the hypothesis. On the state-level, it appears that Hypothesis 7, which theorizes that the more impact a disaster has, the more likely people are to see the environment as a top priority, is not supported. The logarithm of the total deaths in Model 5 has a negative coefficient that is statistically significant at the $p<0.05$ level. Meanwhile, the coefficient in Model 7 on total deaths is not statistically significant. In terms of total affected, the results are not statistically significant in either model.

At the national level, none of the results for total deaths or total affected are statistically significant. Once again, there is no support for Hypothesis 7. Instead, the evidence supports the claim that there is no relationship between the variables. This means that individuals are not more or less likely to list the environment as the most important problem when a disaster occurs that impacts a higher number of people.

It may not be too surprising to see that there is no relationship between opinions and total affected. This is because the definition of total affected can have a wide range of meanings. For some, an individual saw a storm out their window and had to clean-up a few tree branches in their yard afterward. For others, their home was destroyed, and their life changed. Those who experience the former may not see the need for their beliefs to change, for the impact was minimal. Situations like this could be causing this study's insignificant results.

The results on total deaths are more surprising. As total deaths rise, people are not more likely to see the environment as a top issue. The reasons behind this may be similar to those for the number of disasters in Hypothesis 1. People may not understand the relationship between the environment and natural disasters or may see other issues as more important when total deaths rise. It may also be the case that impact-level is measured incorrectly in this study. Disasters that are more common in the news or costing individuals more money could be a more accurate representation of the impact-level of a disaster.

Disasters' Influence on the Economy, Unemployment, and Healthcare: Due to the lack of a relationship between natural disasters and opinion of the environment as a top priority, this study examined whether there was a shift in opinion after disasters in one of the other categories that respondents could say is the "most important problem facing the country." Responses other than the environment include the economy, unemployment, and healthcare. Each of these answers have a higher number of responses in the survey than the environment. Appendix C displays results. It appears that on the nationwide level, respondents are more likely to see healthcare and unemployment as a top priority as the number of disasters increases, for there is positive and

statistically significant coefficients at the $p<0.001$ level. However, as national deaths increase, individuals become less likely to see healthcare or unemployment as the most important problem. In terms of the economy response, a strong relationship is not found between public opinion and natural disasters except for a negative coefficient for the number of disasters at the state level ($p<0.01$) and a positive coefficient for the total deaths nationwide ($p<0.001$).

Essentially, this data shows that disasters influence opinions on issues other than the environment. The finding most relevant to this thesis is that nationwide disasters influence how individuals prioritize healthcare and unemployment, causing them to view these issues as more important. Therefore, individuals could be prioritizing other issues over the environment after a disaster, for there are positive correlations found on these non-environmental issues. However, it is important to note that these correlations are only at the nationwide level and not at the state-level.

Conclusion

Beyond numbers, this data suggests several conclusions about the hypotheses. To begin, natural disasters do not have a significant impact on public opinion on the urgency of climate change. At times, there does seem to be some evidence that they might cause more individuals to view the environment as a top concern; however, this relationship is weak. In is more common to find that the demographic factors have straightforward analyses, for younger, left leaning, and highly educated individuals are more likely to see the importance of the environment.

One must note that this does not necessarily mean that the average person's opinion of climate change does not change after a disaster. The question in the survey asks about what individuals consider to be the top problem in the United States. It is still plausible that the environment becomes a higher priority but is never the *top* priority. Perhaps other issues still concern individuals more, such as unemployment or healthcare.

Proceeding forward, future studies could address some of the issues that this study does not yet reach. For one, it could be helpful to compare this data to new variables, such as the monthly unemployment numbers of each state, in order to analyze whether the economy could change how people view the importance of climate change during a disaster. Furthermore, a study that looks only at the disasters with higher media coverage could also be useful. This is because of the agenda-setting theory, a theory that explains how rare and significant events are those that cause policy discussions and change (Birkland & Schwaeble, 2019). This paper looked only at the disasters that impacted more people or caused more deaths, but not those that had a higher presence in the news and other media.

For now, however, this study of disasters over the long term does not show the same results as past studies on the topic. Disasters did not have a clear and significant impact on climate change opinions in the U.S. This could mean either that either more education is needed on the relationship among natural disasters, climate change, and their risks, or that media attention on disasters are not the correct way to get people mobilized on climate change opinions and policies. Furthermore, activists could focus their efforts on the groups that don't yet show strong support for climate change mitigation, such as Republicans or those who are of an older age.

Nonetheless, climate change is a top priority issue in the world right now, and if not addressed, will cause the U.S. and the world more problems down the road.

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Appendix

Appendix A

Regressions with fixed effects on month/year for state variables, and month and year separately for nationwide variables.

Logit commands (This is the regression used throughout the essay):

Code (this is Table 1 in the essay):
eststo: logit env Numberdisaster gr age educ income ideol i.State_num i.mdate
eststo: logit env m3Numberdisaster gr age educ income ideol i.State_num i.mdate
eststo: logit env NATNumberdisaster gr age educ income ideol i.State_num i.yr i.month
eststo: logit env NATm3NumberDisaster gr age educ income ideol i.State_num i.yr i.month

Table 1: Impact of the Number of Disasters on Environment Public Opinion

	Model 1	Model 2	Model 3	Model 4
Environment				
Natural Disasters, State-level (month of survey)	0.0331			
	(0.66)			
Natural Disasters, State-level (last three months)		0.0274		
		(0.98)		
Natural Disasters Nationwide (month of survey)			0.00486*	
			(2.04)	

Natural Disasters Nationwide (last three months)				-0.000502
				(-0.33)
Gender	-0.0591	-0.0592	-0.0616	-0.0614
	(-1.24)	(-1.24)	(-1.30)	(-1.29)
Age	-0.0117***	-0.0117***	-0.0117***	-0.0116***
	(-8.54)	(-8.54)	(-8.53)	(-8.53)
Education	0.333***	0.333***	0.331***	0.332***
	(13.14)	(13.14)	(13.12)	(13.12)
Income	0.0173	0.0172	0.0156	0.0156
	(1.50)	(1.49)	(1.36)	(1.36)
Ideology	0.809***	0.809***	0.807***	0.808***
	(33.18)	(33.18)	(33.24)	(33.26)
N	155838	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001	

Code (this is Table 2 in the Essay):
eststo: logit env m3Numberdisaster logm3TD logm3TA gr age educ income ideol i.State_num i.mdate
eststo: logit env NATm3NumberDisaster NATm3logTD NATm3logTA gr age educ income ideol i.State_num i.yr i.month
eststo: logit env m3Numberdisaster logm3TD logm3TA NATm3NumberDisaster NATm3logTD NATm3logTA gr age educ income ideol i.State_num i.yr i.month

Table 2: Impact of Number of Disasters, Total Affected, and Total Deaths on Environment Public Opinion

	Model 5	**Model 6**	**Model 7**
Environment			
Natural Disasters, State-level (last three months)	0.125**		0.110**
	(3.03)		(2.76)

Total Deaths, State-level (last three months)	-0.0681*		-0.0507
	(-2.25)		(-1.74)
Total Affected, State-level (last three months)	-0.0123		-0.0150
	(-1.21)		(-1.58)
Natural Disasters Nationwide (last three months)		-0.000805	-0.00195
		(-0.45)	(-1.02)
Total Deaths Nationwide (last three months)		0.00893	0.0175
		(0.33)	(0.64)
Total Affected Nationwide (last three months)		-0.00183	0.00196
		(-0.22)	(0.23)
Gender	-0.0580	-0.0615	-0.0604
	(-1.22)	(-1.29)	(-1.27)
Age	-0.0117***	-0.0116***	-0.0116***
	(-8.54)	(-8.53)	(-8.53)
Education	0.333***	0.332***	0.332***
	(13.15)	(13.12)	(13.13)
Income	0.0170	0.0156	0.0153
	(1.47)	(1.35)	(1.33)
Ideology	0.809***	0.808***	0.808***
	(33.18)	(33.26)	(33.26)
N	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001

Regdfe commands (note that these tables show the models out of order):
Code:
reghdfe env Numberdisaster gr age educ income ideol, absorb(mdate statestring)
estimates store Model1
reghdfe env m3Numberdisaster gr age educ income ideol, absorb(mdate statestring)
estimates store Model2

reghdfe env NATNumberdisaster gr age educ income ideol, absorb(statestring yr month)
estimates store Model3
reghdfe env NATm3NumberDisaster gr age educ income ideol, absorb(statestring yr month)
estimates store Model4

Impact of the Number of Disasters on Environment Public Opinion using regdfe command

	Model 1	Model 2	Model 3	Model 4
Natural Disasters, State-level (month of survey)	0.000383			
	(0.66)			
Natural Disasters, State-level (last three months)		0.000369		
		(1.18)		
Natural Disasters Nationwide (month of survey)			0.0000422	
			(1.68)	
Natural Disasters Nationwide (last three months)				-0.00000983
				(-0.65)
Gender	-0.000264	-0.000265	-0.000267	-0.000269
	(-0.47)	(-0.47)	(-0.47)	(-0.48)
Age	-0.000116***	-0.000116***	-0.000116***	-0.000115***
	(-7.19)	(-7.19)	(-7.18)	(-7.17)
Education	0.00369***	0.00369***	0.00368***	0.00368***
	(13.07)	(13.07)	(13.05)	(13.06)
Income	0.000177	0.000176	0.000168	0.000169
	(1.28)	(1.28)	(1.22)	(1.23)
Ideology	0.0100***	0.0100***	0.0100***	0.0101***
	(35.85)	(35.85)	(35.90)	(35.91)
N	155838	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001	

Code:

```
reghdfe env m3Numberdisaster logm3TD logm3TA gr age educ income ideol, absorb(mdate statestring)
estimates store Model1
reghdfe env NATm3NumberDisaster NATm3logTD NATm3logTA gr age educ income ideol, absorb(statestring yr month)
estimates store Model2
reghdfe env NATm3NumberDisaster m3Numberdisaster NATm3logTD logm3TD NATm3logTA logm3TA gr age educ income ideol, absorb(statestring yr month)
estimates store Model3
```

Table 2: Impact of Number of Disasters, Total Affected, and Total Deaths on Environment Public Opinion using reghdfe command

	Model 1	Model 2	Model 3
Natural Disasters, State-level (last three months)	0.00125**		0.00115*
	(2.59)		(2.45)
Total Deaths, State-Level (last three months)	-0.000736*		-0.000562
	(-2.21)		(-1.75)
Total Affected, State-Level (last three months)	-0.0000322		-0.0000730
	(-0.30)		(-0.71)
Natural Disasters Nationwide (last three months)		-0.00000633	-0.0000207
		(-0.35)	(-1.07)
Total Deaths Nationwide (last three months)		-0.0000865	0.0000420
		(-0.30)	(0.14)
Total Affected Nationwide (last three months)		-0.0000188	0.000000355
		(-0.20)	(0.00)
Gender	-0.000261	-0.000270	-0.000267
	(-0.46)	(-0.48)	(-0.47)
Age	-0.000116***	-0.000115***	-0.000115***
	(-7.18)	(-7.17)	(-7.17)
Education	0.00369***	0.00368***	0.00368***
	(13.07)	(13.06)	(13.06)

Income	0.000175	0.000169	0.000167
	(1.27)	(1.23)	(1.22)
Ideology	0.0100***	0.0101***	0.0101***
	(35.85)	(35.91)	(35.91)
N	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001

Appendix B

Regressions with fixed effects on month/year for state variables, and year for nationwide variables.

Code:

eststo: logit env Numberdisaster gr age educ income ideol i.State_num i.mdate
eststo: logit env m3Numberdisaster gr age educ income ideol i.State_num i.mdate
eststo: logit env NATNumberdisaster gr age educ income ideol i.State_num i.yr
eststo: logit env NATm3NumberDisaster gr age educ income ideol i.State_num i.yr

Impact of the Number of Disasters on Environment Public Opinion (Without Nationwide Month Fixed Effect)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Environment				
Natural Disasters, State-level (month of survey)	0.0331			
	(0.66)			
Natural Disasters, State-level (last three months)		0.0274		
		(0.98)		
Natural Disasters Nationwide (month of survey)			0.00247	
			(1.14)	
Natural Disasters Nationwide (last three months)				-0.00112
				(-0.88)
Gender	-0.0591	-0.0592	-0.0630	-0.0632
	(-1.24)	(-1.24)	(-1.33)	(-1.33)

Age	-0.0117***	-0.0117***	-0.0116***	-0.0116***
	(-8.54)	(-8.54)	(-8.47)	(-8.48)
Education	0.333***	0.333***	0.332***	0.332***
	(13.14)	(13.14)	(13.14)	(13.14)
Income	0.0173	0.0172	0.0166	0.0165
	(1.50)	(1.49)	(1.44)	(1.43)
Ideology	0.809***	0.809***	0.806***	0.806***
	(33.18)	(33.18)	(33.21)	(33.23)
N	155838	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001	

Code:
eststo: logit env m3Numberdisaster logm3TD logm3TA gr age educ income ideol i.State_num i.mdate
eststo: logit env NATm3NumberDisaster NATm3logTD NATm3logTA gr age educ income ideol i.State_num i.yr
eststo: logit env NATm3NumberDisaster m3Numberdisaster NATm3logTD logm3TD NATm3logTA logm3TA gr age educ income ideol i.State_num i.yr

Impact of Number of Disasters, Total Affected, and Total Deaths on Environment Public Opinion (Without Nationwide Month Fixed Effect)

	Model 5	**Model 6**	**Model 7**
Environment			
Natural Disasters, State-level (last three months)	0.125**		0.107**
	(3.03)		(2.68)
Total Deaths, State-Level (last three months)	-0.0681*		-0.0566
	(-2.25)		(-1.95)
Total Affected, State-Level (last three months)	-0.0123		-0.0143
	(-1.21)		(-1.51)
Natural Disasters Nationwide (last three months)		-0.000440	-0.00142

		(-0.28)	(-0.85)
Total Deaths Nationwide (last three months)		-0.0174	-0.00650
		(-0.72)	(-0.26)
Total Affected Nationwide (last three months)		0.00177	0.00491
		(0.23)	(0.60)
Gender	-0.0580	-0.0633	-0.0624
	(-1.22)	(-1.33)	(-1.31)
Age	-0.0117***	-0.0116***	-0.0116***
	(-8.54)	(-8.48)	(-8.47)
Education	0.333***	0.332***	0.332***
	(13.15)	(13.14)	(13.15)
Income	0.0170	0.0166	0.0163
	(1.47)	(1.44)	(1.42)
Ideology	0.809***	0.806***	0.806***
	(33.18)	(33.23)	(33.23)
N	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001

Appendix C

Regressions on alternate responses on the question of "What is the most important problem facing the United States today?" The first row shows information on those who answered "the Economy", the second row are those who answered "Unemployment" and the last row are those who answered "Healthcare".

Code:

eststo: logit econ NATm3NumberDisaster m3Numberdisaster NATm3logTD logm3TD NATm3logTA logm3TA gr age educ income ideol i.State_num i.yr i.month
eststo: logit unemploy NATm3NumberDisaster m3Numberdisaster NATm3logTD logm3TD NATm3logTA logm3TA gr age educ income ideol i.State_num i.yr i.month
eststo: logit HC NATm3NumberDisaster m3Numberdisaster NATm3logTD logm3TD NATm3logTA logm3TA gr age educ income ideol i.State_num i.yr i.month

Alternate Responses to the Most Important Problem

	Economy	Unemployment	Healthcare
Natural Disasters, State-level (last three months)	-0.0315**	-0.0357*	0.0296
	(-2.59)	(-2.19)	(1.44)
Total Deaths, State-Level (last three months)	0.00195	0.0153	0.0440**
	(0.23)	(1.39)	(3.07)
Total Affected, State-Level (last three months)	0.00480	-0.00318	-0.0297***
	(1.87)	(-0.96)	(-6.28)
Natural Disasters Nationwide (last three months)	-0.000796	0.00396***	0.00550***
	(-1.69)	(6.82)	(6.78)
Total Deaths Nationwide (last three months)	0.0268**	-0.0665***	-0.0778***
	(3.26)	(-6.27)	(-5.95)
Total Affected Nationwide (last three months)	0.00215	0.00406	-0.0151***
	(0.83)	(1.24)	(-3.42)
Gender	-0.0816***	0.0252	0.423***
	(-5.51)	(1.32)	(17.01)
Age	-0.00370***	0.00623***	-0.00687***
	(-8.59)	(11.61)	(-9.82)
Education	0.113***	-0.200***	0.0255*
	(15.52)	(-20.71)	(2.08)
Income	0.0659***	-0.0535***	0.00814
	(18.20)	(-11.47)	(1.37)
Ideology	0.0117	0.0845***	0.199***
	(1.58)	(8.97)	(16.56)
N	155838	155838	155838
t statistics are in parentheses	* p<0.05	** p<0.01	*** p<0.001