Place, Perception, or Politics? Measuring U.S. Urban-Rural Natural Disaster Resilience Capacity

Thematic Area: Good Practices in Climate Change Mitigation, Adaptation, and Resilience

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Abstract

Natural disasters in the United States have caused a spur in conversations regarding best practices and solutions for preparing communities for the implications of climate change. Resilience practices specifically recognize the need to bolster socially vulnerable populations with increased technical assistance and planning capacity. Although efforts to equip socially vulnerable regions with the right resiliency tools have been underway, what is important to understand is the capacity of these communities to influence the effectiveness of natural disaster resiliency planning. Existing literature indicates that regional, economic and sociopolitical factors influence people's worldview, including their perceptions of the environment and vulnerability to natural disasters. Factors such as social capital conditions, natural disaster exposure risk, and political preferences have shown to be influential predictors in people's perception regarding the environment. Consequently, this affects their capacity for resilience. Therefore, the need to examine the capacity of communities in planning and implementing effective natural disaster resiliency measures is important. This study explores how urban-rural counties across the United States perceive the environment and climate change risk in the context of social vulnerability and their political preferences. As a result, this study serves as a practical application tool for decision-makers in allocating resources, given communities' capacity to prepare for natural disasters. We use county-level data across the continental United States to examine if the effects of social vulnerability characteristics, natural disaster exposure risk, and political affiliation vary across the urban-rural landscape with respect to peoples' environmental perceptions. The perception of the environment and the reception of natural disaster resiliency tools varies across urban-rural regions. This understanding provides an innovative approach to allocating natural disaster-related resources to communities based on their risk perception. These varied perceptions, in some instances, could result in an overly surplus or insufficient allocation of resources by public officials and planners. Hence, this study will assist stakeholders to understand the conditions under which individuals or communities may understate or exaggerate their need for natural disaster resilience resources. Additionally, exploring community perceptions of the environment, given their social vulnerability will highlight regions in need of resiliency education and capacity building tools. These tools are vital for informing strategies to safeguard communities from future natural disaster events and impacts

Keywords:
Natural Disasters, Resilience, Capacity Building, Risk Perception, Environmental Policy

Introduction

Since 1980 the United States has experienced 241 weather-related events where the cumulative costs from damages have been greater than $1 billion (Table 1, NOAA, 2019a). Additionally, the overall costs of these weather events is over $1.6 trillion so far, while more frequent weather-related natural disaster events are predicted (NOAA, 2019a). Disaster event types vary over the 1980-2018-time frame, with 42% reported as severe storms at $226.9B in loss as compared to $919.7B in loss for tropical cyclone events which had the second highest occurrence frequency at 17.4%. Freeze and winter storm events combined total 10.3% of all hazard events and make up for $70.3 B in losses. This show that geography matters when hazard/climate disaster strikes. After long deliberation and wait for disaster relief funds, in June 2019, the United States Congress passed a $19.1 billion bipartisan disaster assistance bill (Appropriation.House.Gov, 2019). The need for the United States Congress to approve supplemental disaster relief packages is not new and bipartisan support for natural disaster assistance policy makes sense because natural disasters are blind to geopolitical borders, socioeconomic conditions, gender, and race. What is relevant is that the June 2019 supplemental disaster relief package was delayed due to partisan disagreement about the amount of funds for Puerto Rico, post hurricane Maria. This was the longest time period recorded for the United States Congress vote for a disaster relief bill due to a specific disaster community. What this means for congressional support for future disaster aid in rural, suburban and urban communities is unknown.

When a natural disaster declaration event occurs the Federal Emergency Management Agency (FEMA)[1] deploys within its 10 United States regions, people and resources to assist state, county, and local government response and recovery efforts. Once the response and recovery efforts have stabilized, FEMA continues to support community resilience efforts with grant funds and technical assistance (FEMA, 2004; DRRA, 2018). The local government and community are responsible for deciding the new development and progress of the community in terms of 'bouncing back' from the disaster. This highlights the importance of equipping communities with the right tools to manage and bounce back from the impacts of a natural disaster. Therefore, the more knowledgeable and prepared a community is prior to a natural disaster event, the more resilient they may be once disaster strikes (NOAA, 2019b).

[1] On Oct. 5, 2018, President Trump signed the Disaster Recovery Reform Act of 2018 into law as part of the Federal Aviation Administration Reauthorization Act of 2018 (DRRA. 2018). The purpose of this reform is to acknowledge the shared responsibility for disaster response and recovery. It aims to reduce the complexity of FEMA and build the nation's capacity for the next catastrophic event. The law contains approximately 50 provisions that require FEMA policy or regulation changes for full implementation, as they amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act (https://www.fema.gov/robert-t-staford-disaster-relief-and-emergency- assistance-act-public-law-93-288-amended).

Table 1: Breakdown by hazard type of the 241-billion-dollar weather and climate disasters assessed from 1980-2018 (CPI-adjusted) (Source: NOAA, 2019a)

Disaster Type	Number of Events	Percent Frequency	CPI-Adjusted Losses (Billions of Dollars)	Percent of Total Losses	Average Event Cost (Billions of Dollars)
Drought	26	10.80%	$244.30	14.60%	$9.40
Flooding	29	12.00%	$123.50	7.40%	$4.30
Freeze	9	3.70%	$30.00	1.80%	$3.30
Severe Storm	103	42.70%	$226.90	13.60%	$2.20
Tropical Cyclone	42	17.40%	$919.70	55.10%	$21.90
Wildlife	16	6.60%	$78.80	4.70%	$4.90
Winter Storm	16	6.60%	$47.30	2.80%	$3.00
All Disasters	241	100%	$1,670.50	100%	$6.90

In order to receive grant funds and support to expedite recovery or 'bounce back' of the community, FEMA requires communities to have their disaster management plans in place prior to the disaster occurrence. Recognizing the limited ability of smaller communities to bounce back from natural disasters, FEMA provides additional resources for communities with less than 25,000 in population and small impoverished communities with less than 3,000 in population (FEMA, 2004, DRRA, 2018). Although FEMA provides the funds for disaster preparedness, it is the responsibility of states to implement FEMA approved hazard mitigation plans for all residents in order to be eligible for these grant funds.

The conversation regarding resiliency efforts is incomplete without an understanding of the spatial and demographic context within which these efforts can be operationalized. The United States consists of about 90% of rural land area populated by over 60 million people, reflecting less than 20% of the entire United States population (HAC, 2018). Rural areas are growing in diversity, have higher rates of homeownership and are increasing in age as compared to urban areas. The Redefining Rural America Report (CFAP, 2019) indicates that in order for a policy to be more equitable and effective, the urban-rural narrative needs to be more nuanced than a one size fits all solution. To provide more evidence against the one size fits all policy, rural areas now tend to have higher credit needs as compared to urban areas. Simultaneously, they are experiencing a decline in banks and federally backed lending institutions, thereby exasperating their situation. As of 2018, approximately 70% of rural mortgages are from urban lending institutions (HAC, 2018). Further, the stagnation of wages in rural areas continues as compared to urban areas. This stagnation coupled with the loss of younger populations and lower education attainment rates makes rural households more financially vulnerable. When this economic and social vulnerability is met with the occurrence of a natural disaster, it limits the ability of rural residents to plan for and implement their social and economic come back.

States ability to design and develop a disaster response plan is not void of political or ideological influence. Perceived level of disaster threat is typically viewed with partisan or ideological lenses (YPCC, 2019). Therefore, political office holders may choose to design a disaster preparedness plan in a manner that constituents will be happy with, not the plan that may be warranted. As a result, the disaster preparedness plan accepted by a community that believes in limited government interference in their affairs, may be different from one where the community supports greater government involvement. As long as a political leader's motives are incentivized by a

guaranteed win in the next election, there will always be the danger of making preparations that conform to the political preferences of the community rather than the actual degree of need.

The above-highlighted challenges call for new solutions to disaster preparedness in both rural and urban settings. Therefore, in light of this need, the purpose of this research is to assist policymakers with a greater understanding of how environmental perception and the reception of natural disaster resiliency tools may vary across urban-rural regions. This study seeks to better understand how support for environmental policies from the 2016 Cooperative Congressional Collection Survey (CCES) responses are influenced by the growing socio-political divide, the nature of urban-rural areas, race, social vulnerability conditions, and previous disaster exposure. Specifically, the study examines if support for environmental policy differs in urban-rural counties, amongst race and is influenced by political affiliation. Additionally, the nature of how previous disaster exposure and social vulnerability of the counties impact these perceptions is considered.

A greater understanding of how communities perceive environmental policy and risks may serve to inform context-sensitive narratives and outreach approaches that better reflect a community's values and understanding about how they should prepare for a natural disaster event. This understanding provides an innovative approach to allocating natural disaster-related resources to communities based on their risk perception. These varied perceptions, in some instances, could result in an overly surplus or insufficient allocation of resources by public officials and planners. Hence, this study will assist stakeholders to understand the conditions under which individuals or communities may understate or exaggerate their need for natural disaster resilience resources. Additionally, exploring community perceptions of the environment, given their social vulnerability will highlight regions in need of resiliency education and capacity building tools. These tools are vital for informing strategies to safeguard communities from future natural disaster events and impacts.

From a broader perspective, the differences in urban-rural political inclination, race, social vulnerability, and environmental policy perceptions may inform the nature and extent of United States disaster assistance funds and FEMA support actions across urban-rural areas. Will the increase in disaster costs and growing political divide amongst urban-rural populations mean that only some will be eligible for disaster assistance while others wait? The policy implications are already presenting themselves. The June 2019 bipartisan disaster assistance package that resulted in the longest delay between a disaster and the congressional approval of assistance is one example of this potential implication. (King, 2019). Increased delays in disaster aid funding approval will implicate communities with high social vulnerability in greater ways than those that are less vulnerable and more capable of addressing community needs while they await funding.

As our literature review details, there is a consensus that social vulnerability reduces natural disaster resilience. Also, the economic disparity between urban and rural areas is believed to be accompanied by a growing socio-political divide and differences in the perception of the value for enhanced environmental policy to address climate change. The literature with regard to greater education and understanding about the impending need for increased community resilience and preparedness to natural disaster events is substantive and aligned in its suggestion that more research and education is warranted.

Our study examines how attitudes towards enhanced environmental regulations vary based on geography, population density, race and political party preference to evaluate the nature of community perceptions about natural disaster events. The research design includes urban-rural counties across the United States to better understand the dilemma of how to improve education and communication about the relationship between environmental regulations and climate

science policy. We return to how differences that have resulted from the growing socio-political divide in the United States need to be understood by policymakers in the conclusion and emphasize the importance of the need for greater education and varied approaches for enhancing natural disaster resilience planning, practice, and narratives.

Literature Review

There is a growing consensus in the literature that populations with increased social vulnerability are less resilient to natural disaster events. Because all regions of the United States have experienced a natural disaster event, the concept of social vulnerability within a disaster management context continues to receive attention in the literature (ATSDR, 2018; Cutter, 2016; Flanagan, et al, 2011; Juntunen, 2005). One recent area of interest is understanding how congressional support for ever-increasing FEMA disaster relief funding will be influenced by an ever-growing political divide in the United States. While the literature does not expressively evaluate the nature of recent congressional action, it does evaluate the relationship between political partisanship and urban and rural support for enhanced climate change policies.

The work of Cutter et al. (2003; 2008) includes a social vulnerability index (SVI) related to disaster resilience. This tool was developed for researchers and policymakers for understanding the relationship between underlying community vulnerability factors and disaster risk. Currently, the Center for Disease Control (CDC) uses an SVI with 15 United States census variables at tract level to help local officials identify communities that may need support in preparing for hazards; or recovering from disaster (ATSDR, 2018). The 15 variables are represented by four themes: socioeconomic status, housing composition and disability, minority status, and language and housing and transportation. The CDC SVI has been supported in the literature as a tool for assisting with hazard mitigation planning studies, particularly for rural communities (Horney et al., 2015; 2017).

The spatial distribution of populations at greater risk to natural disaster events has been explored in the literature as well (Frazier et al, 2013). Ever since the 2016 presidential election, attention to the needs and desires of urban, suburban, and rural communities has increased and the topic of the urban-rural divide continuum has seen a resurgence in news stories, academic research, and philanthropic investments. Urban-rural counties are ideal for focusing on resilience building because states along with their county governments have the authority to oversee disaster policy (Cutter et al., 2010). Mapping CDC SVI county-level data reveal spatial patterns of potential vulnerability to disaster which assists in understanding how the disaster cycle: preparedness, response, recovery, and mitigation, may be an increased risk for some communities compared to others (ATSDR, 2018; Morrow, 1999). Additional work has explored the impact of natural disasters explicitly for rural communities (Dabson, 2011; Homsy & Warner, 2013). Problems in rural hazard preparedness may include limited funding for rural assistance agencies such as ambulance and fire staff, increased travel impedances, longer travel distances and response times for emergency management personnel, and out-migration of young people which affects workforce and staffing. Additionally, because public communication infrastructure is more expensive per capita, effective communication systems may be substandard or non-existent in these communities (RHIH, 2018).

More recently the role of political party affiliation as it relates to environmental policy support and climate science recognition has also been explored in the literature. The motivated attention experimental research by Luo and Zhao (2019) indicates that political orientation may bias the way individuals pay attention to climate change evidence. Individual perception of this evidence varies in accordance with their stated liberal or conservative values. The Yale Program on Climate

Change Communication (YPCC) conducted a national survey from 2008 to 2017 that clearly indicates the growing divide between democrats and republicans with regard to the role of anthropogenic sources, blame for increased severe weather events, and how individuals perceive their risk and vulnerability to severe weather events (YPCC and Mason4C, 2019; Ballow et al., 2019).

Among some of the factors explored in the literature regarding environmental perception and attitudes, racial background has been viewed as a key factor in influencing an individual's environmental perception. The Hierarchy of Needs Theory[2] (Maslow, 1970) and Environmental Deprivation Theory[3] (Liere & Dunlap, 1980) provide the theoretical framework for determining this relationship. According to the Hierarchy of Needs Theory we expect that minority populations, due to their higher socio-economic vulnerability, would be less likely to support environmental policy regulation. On the other hand, Environmental Deprivation Theory predicts that those at higher risks or exposure to deteriorating environments will be more likely to have positive environmental attitudes. One can infer from this that because minority populations are more likely to live in deteriorating environments, they will be have a higher likelihood of supporting environmental actions.

A review of the literature provides us with several variables that could influence one's perception of the environment and consequently their support for environmental regulation. These factors will help us determine the reception of environmental resources such as resiliency tools based on an individuals' location, exposure, political affiliation, and their racial background.

Methodology and Data

To analyze the underlying factors that cause disparities regarding perceptions of the environment across communities, we collect our variables from several sources. The 2016 Cooperative Congressional Election Survey (CCES) provides us with four questions regarding support for environmental policy, which were evaluated for 3,143 continental United States counties. The questions are listed in Table 2. Each of these questions tap into unique domains of an individual's environmental policy preferences. These preferences also suggest the degree of an individual's possible reception to suggested resiliency tools. Questions about the Environmental Protection Agency (EPA) and the Clean Air Act tap into an individual's preference of how much government involvement is acceptable to them. The questions on fuel efficiency and renewable probe into how much the individual is willing to sacrifice for the overall environmental good. A combination of these two aspects provides a measure of the overall stance an individual has with respect to environmental concerns. Thus, in order to analyze an individual's overall environmental preference, we created an additive index that unified the responses from the four questions. The categories and their distributions are provided in Table 3.

[2] The Hierarchy of Needs Theory suggests that poor or minority populations have more pressing daily needs, which include earning wages and taking care of dependents, and therefore, concerns regarding the environment or its protection become secondary.

[3] Environmental Deprivation Theory links exposure to deteriorating environments. The more exposed an individual is to environmental risk, the more likely they are to have positive environmental perceptions.

Table 2 Environmental policy perception questions from the Cooperative Congressional Election Survey of 2016

Variable Name	Survey Question Wording	Response Scale
EPA_regulate	Give Environmental Protection Agency power to regulate Carbon Dioxide emissions	0 – Oppose 1 – Support
Fuel Efficiency	Raise required fuel efficiency for the average automobile from 25 mpg to 35 mpg	0 – Oppose 1 – Support
Renewables	Require a minimum amount of renewable fuels (wind, solar, and hydroelectric) in the generation of electricity even if electricity prices increase somewhat	0 – Oppose 1 – Support
Strengthen_acts	Strengthen enforcement of the Clean Air Act and Clean Water Act even if it costs U.S. jobs	0 – Oppose 1 – Support

Table 3 Dependent Variable – Environmental Index created from the four environmental policy perception survey questions from the Cooperative Congressional Election Survey of 2016

Environmental Index	Frequency	Percent	Cum.
0 - Do not support any of the policy options	10,035	15.58	15.58
1 - Supports only one of the policy options	6,647	10.32	25.90
2 - Supports only two of the policy options	9,167	14.23	40.13
3 - Supports only three of the policy options	11,485	17.83	57.97
4 - Supports all four policy option	27,072	42.03	100.00
Total	N= 64,406	100	

The Social Vulnerability Index (SVI) and urban-rural divide were the key independent variables in the study. The SVI is from the ATSDR's Geospatial Research, Analysis & Services Program (GRASP) 2016 Social Vulnerability Index. SVI is a tool used by public health officials and emergency response planners to identify and map communities which might currently or in the future need support after a hazardous event such as severe weather, floods, disease outbreaks, or chemical exposure (SVI documentation). The index is made up of four components or themes, on the basis of which communities are ranked and given values between 0 to 1. The four themes range from socioeconomic, household composition and disability, minority status and language, and housing and transportation. In our study, we used the socioeconomic dimension of the SVI as our measure of vulnerability. This is because socioeconomic measures have been implicated in many studies as predictors of individual's capabilities to influence situations and or inform their

overall preferences, especially with regards to the environment (Liere & Dunlap, 1980; Whittaker et. al, 2005).

Our second key independent variable is the urban-rural Isserman code developed by Andrew Isserman (2005). This code deviates from the traditional method of categorizing counties as purely urban or rural, which does not accurately measure the diversity in population density which exists across counties. Instead, the Isserman code ranks counties on a continuum into four classes: urban, urban mixed, rural, and rural mixed. There are many ways to define and categorize urban and rural in the literature. We use the Isserman classification because it allows for inner and outer suburban counties or mixed urban and mixed rural areas to be evaluated along the rural-urban continuum. No one county is truly entirely urban or entirely rural, however the ability to categorize counties based on population density patterns across the county into four versus two categories is more reflective of US demographic and land use patterns (Isserman, 2005).

Our political variable is the presidential election results from 2016. Counties were categorized as Republican or Democrat based on which party's candidate received a majority vote from that county. This partisan variable also strongly correlates with the general ideological leaning of the county. The Race variable includes categories for White, Black, Hispanic, and other races. Finally, we add a variable indicating the total number of county disaster declarations that occurred between 1953 and 2018.

To measure the overall environmental preferences, we used simple linear regression models to analyze the relationship between our independent variables and our dependent variable. Though the focus of this study is on the overall environmental preferences or attitudes of individuals, for each of the four component parts of the overall policy preferences, we used a logistic regression to investigate each component part[4]. Regression model errors are independent across clusters but correlated within clusters. With expected correlation of individual responses in the same county that can bias our results, we controlled for that effect by clustering our regression at the county level. Furthermore, for the overall environmental preference model, we used dummy variables to parse out the effects of each of the categories in the independent variables.

We were also interested in finding out if an individual's social vulnerability has similar effects across the different geographic spaces. In other words, does an individual's geographic location increase or reduce any potential effect of the person's vulnerability status? To investigate this, we interacted the spatial variable and social vulnerability status. In both situations, we controlled for the effects of race, FEMA regions and number of disaster events experienced by the county. We assume that counties with high number of disaster events are more likely to have a more favorable outlook towards pro-environmental policies compared to counties with fewer disaster events. Race was also controlled for in the study because studies have shown that it is an important predictor of social, economic, and environmental policy preferences. The results are displayed in the next section.

Results and Discussion

In our main model, we regressed our environmental index on other independent variables. As can be seen from Figure 1 all variables except for disaster incidents and mixed urban are statistically significant. Increase in one's vulnerability reduces one's support for pro-environmental policies.

[4] See Appendix 1 for the results of all the five models

Also, in terms of geographic locations, individuals in either rural or mixed rural communities are less likely to support pro-environmental polices compared to people in urban communities. It should be noted that the urban-rural variable is a categorical variable. This mean that the relationship of the spatial variables: mixed urban, rural, and mixed rural, with environmental perception are all compared to urban areas. Race and partisanship also significantly influence environmental attitudes. Here, we see that compared to whites, blacks are more likely to allow broader government involvement or willing to make additional individual sacrifice for a better environment. The same behavior is seen with partisanship. Democrats are more likely to support more governmental influence or willing to make personal sacrifice for perceived better environment. In all, the biggest impact on individual's willingness to either make personal sacrifice or allow more government influence in their community is driven by the individual's partisan leaning.

This contrast to our expectations that individuals in communities that have more disaster exposures over time will be more willing to allow for either more government "help" or more willing to make personal sacrifice. In fact, the model shows the number of disaster declaration events have no relationship with an individual's environmental policy preferences. This is interesting as one would expect that exposure to a natural disaster would alter one's perception regarding the environment.

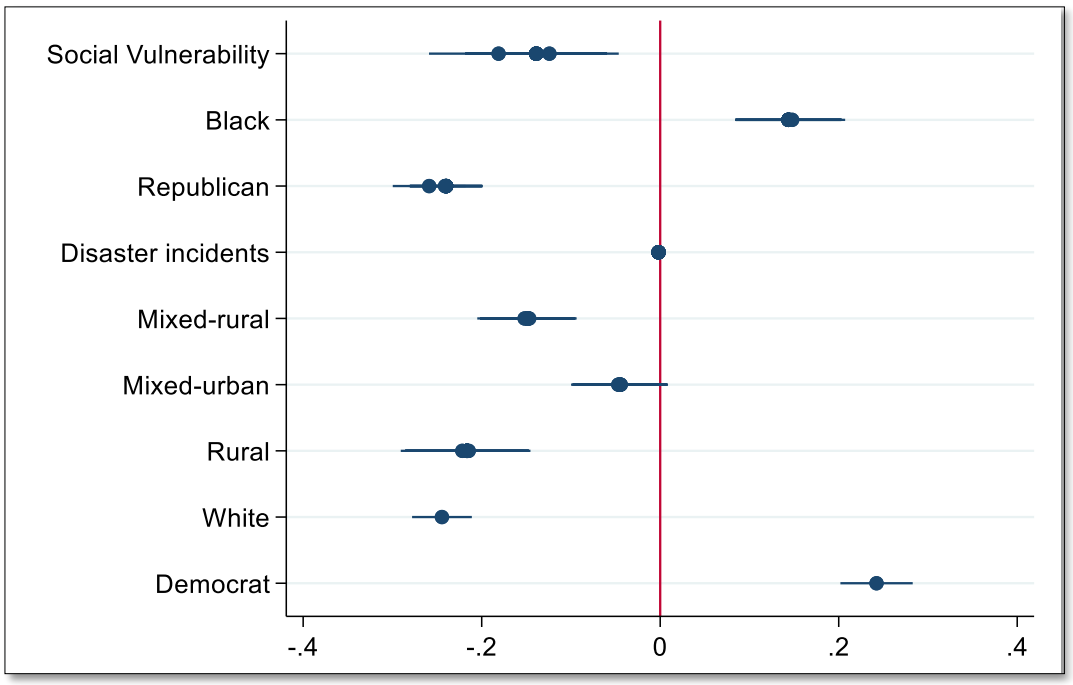

Figure.1. Model 1 - ***Factors that influence individuals' environmental policy perceptions.***

Note: The effects of Rural, Mixed-rural, & Mixed-urban all compare to Urban Areas.

In our interaction model, we test the effects of one's social vulnerability on environmental attitudes and the variation by geographic space. The results show that the effect of social vulnerability varies by location. Figure 2 provides the interaction effects of SVI with each of the spatial categories on an individual's support for pro-environmental policies. The SVI effect is almost zero if the individual lives in an urban community, but if the individual lives in a rural community, increasing social vulnerability reduces the likelihood for the individual to support pro-environmental policies. However, true to Isserman's (2005) notion that the urban-rural dichotomy does not tell the whole story, there is a nuanced relationship and interaction between the two extremes. Figure 3 shows the effect of vulnerability is less drastic for the mixed communities when compared to rural communities, but are more influential when compared to the urban communities. Hence, policymakers should take into consideration how the community or geographic space of an individual may interact with the person's social vulnerability status to increase or reduce the acceptability of proposed policies.

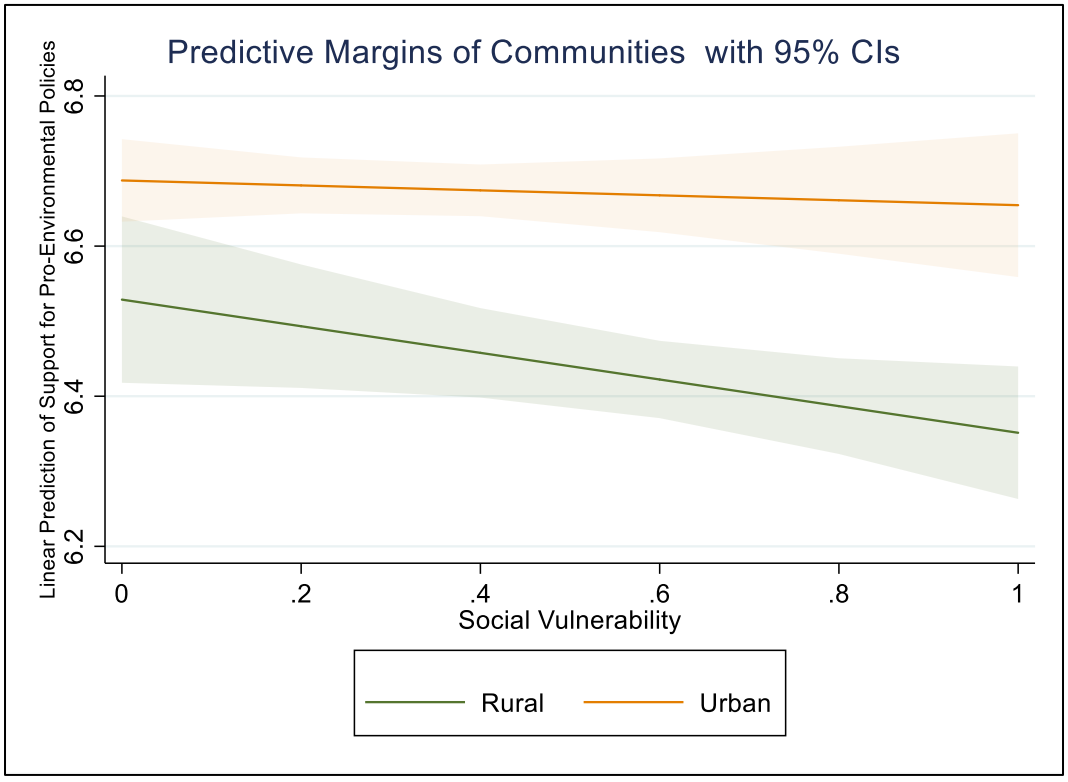

Figure.2. Interaction effects of SVI with only urban and rural spatial categories on an individual's support for pro-environmental policies.

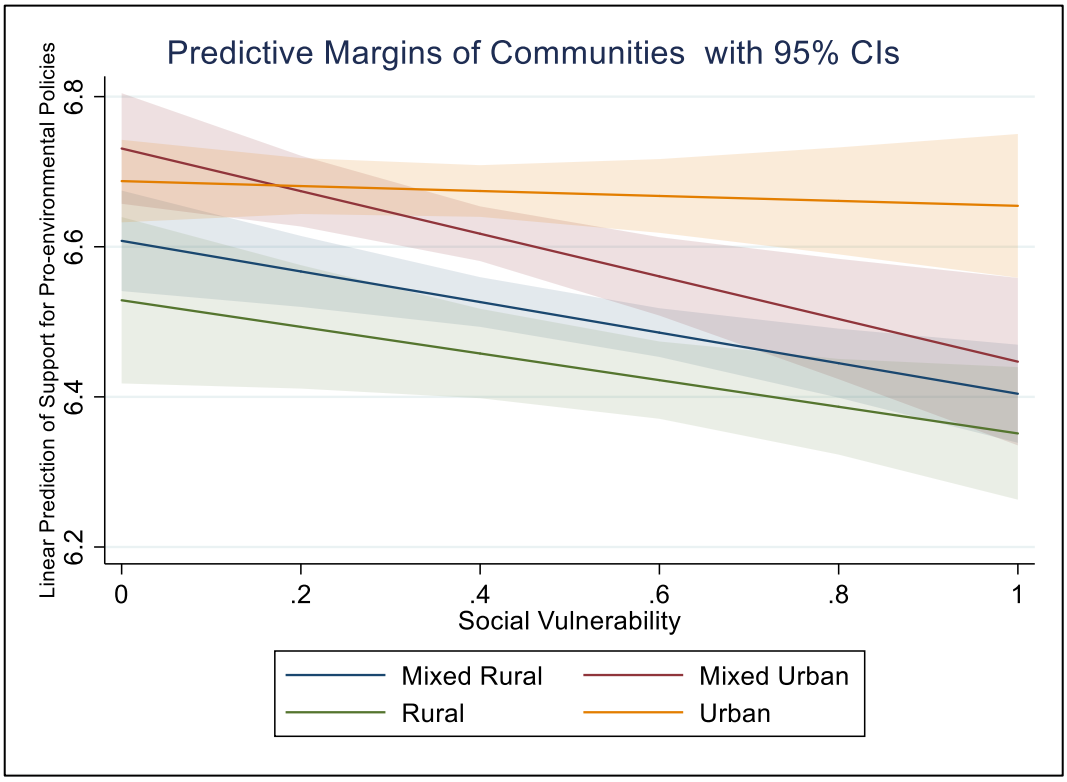

Figure.3. Interaction effects of SVI with each of the spatial categories on an individual's support for pro-environmental policies.

Conclusions

In order to mitigate and plan for emergencies, state, local, and tribal officials need to identify socially vulnerable communities to provide increased assistance during and post-disaster. However, such agencies are generally underfunded and burdened by other responsibilities or unequipped to undertake such a task (Flanagan et. al, 2011). It is then possible that urban or rural areas with higher social vulnerability and low perceived environmental risks will suffer more than areas with low social vulnerability and high perceived environmental risks. These differences in attributes are further nuanced by the political preferences of the community. Therefore, these differences suggest that resources need to be carefully allocated to communities at the nexus of their perceived risks, social vulnerability characteristics, political preferences, and their geographical location.

This study adds one more data point to the growing volume of evidence that the US rural community is far more diverse economically, demographically, and in terms of industry than is frequently reported. The moderating effect of socially vulnerable populations whether they be urban, suburban or rural indicates they are less apt to support enhanced environmental policy actions. Race matters with regard to social vulnerability and the spatial dimensions of urban and rural communities. The growing socio-political divide plays a key role in how an individual

perceives the need for enhanced environmental policies and government intervention in creating a more climate-resilient United States. The challenge of developing a narrative that can educate and inform communities across the United States about the relationship between the environment and natural disaster events will need to be nuanced and context-sensitive based on the nature of the audience. Thus, any discussion of urban, suburban or rural climate science environmental policy solutions will need to acknowledge these differences in order to be effective and equitable.

Finally, this study explores how urban-rural counties across the United States perceive the environment and climate change risk in the context of social vulnerability and their political preferences. As a result, the results from this study can be used as a practical application tool for decision-makers in allocating resources, given communities' capacity to prepare for natural disasters. As we stated above, the perception of the environment and the reception of natural disaster resiliency tools varies across urban-rural regions. This new understanding provides an innovative approach to allocating natural disaster-related resources to communities based on their risk perception. Hence, this study can assist stakeholders to understand the conditions under which individuals or communities may understate or exaggerate their need for natural disaster resilience resources. Additionally, exploring community perceptions of the environment, given their social vulnerability highlights regions in need of resiliency education and capacity building tools. These tools are vital for informing strategies to safeguard communities from future natural disaster events and impacts

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Appendix

Appendix1 … Regressions of environmental policy preference and support attitude

VARIABLES	(1) EPA support	(2) Fuel Efficiency Support	(3) Renewable Energy Support	(4) Clean Air Act Support	(5) Environmental Support Index
Mixed rural	-0.243***	-0.0920***	-0.149***	-0.184***	-0.148***
	(0.0405)	(0.0317)	(0.0323)	(0.0373)	(0.0271)
Mixed urban	-0.115***	-0.0222	-0.0348	-0.0548	-0.0451*
	(0.0414)	(0.0347)	(0.0312)	(0.0371)	(0.0270)
Rural	-0.312***	-0.0713	-0.223***	-0.323***	-0.216***
	(0.0501)	(0.0456)	(0.0438)	(0.0480)	(0.0353)
SVI (SocEcon)	-0.107*	-0.0747	-0.210***	-0.216***	-0.139***
	(0.0584)	(0.0517)	(0.0450)	(0.0558)	(0.0404)
Black	0.458***	0.0637	0.0327	0.171***	0.144***
	(0.0475)	(0.0433)	(0.0459)	(0.0420)	(0.0302)
Hispanic	0.200***	0.0523	0.126**	0.0799*	0.0951***
	(0.0495)	(0.0464)	(0.0521)	(0.0474)	(0.0329)
Other races	0.164***	0.115***	0.126***	0.304***	0.159***
	(0.0366)	(0.0343)	(0.0375)	(0.0322)	(0.0253)
Republican	-0.284***	-0.172***	-0.265***	-0.330***	-0.240***
	(0.0289)	(0.0266)	(0.0265)	(0.0272)	(0.0206)
FEMA1	-0.0723	-0.0685	-0.108**	-0.131**	-0.0832*
	(0.0711)	(0.0533)	(0.0478)	(0.0629)	(0.0450)
FEMA2	-0.136*	-0.0533	-0.166***	-0.213***	-0.127**
	(0.0821)	(0.0656)	(0.0547)	(0.0720)	(0.0515)
FEMA3	-0.0577	-0.00293	-0.0466	-0.0812	-0.0400
	(0.0671)	(0.0457)	(0.0422)	(0.0554)	(0.0396)
FEMA4	-0.278***	-0.154***	-0.211***	-0.244***	-0.196***
	(0.0624)	(0.0430)	(0.0442)	(0.0575)	(0.0405)
FEMA5	-0.153**	-0.0569	-0.102**	-0.140**	-0.0977**
	(0.0674)	(0.0502)	(0.0486)	(0.0633)	(0.0434)
FEMA7	-0.233***	-0.0749	-0.160***	-0.202***	-0.149***
	(0.0744)	(0.0581)	(0.0575)	(0.0636)	(0.0463)
FEMA8	-0.155**	0.0141	-0.198***	-0.204***	-0.121***
	(0.0699)	(0.0532)	(0.0456)	(0.0588)	(0.0420)
FEMA9	-0.239***	-0.0605	-0.153**	-0.158**	-0.135**
	(0.0836)	(0.0629)	(0.0738)	(0.0769)	(0.0589)
FEMA10	-0.141*	-0.0327	-0.140***	-0.195***	-0.113**
	(0.0744)	(0.0486)	(0.0469)	(0.0681)	(0.0470)
Disaster incidents	-0.00242	-0.00158	-0.00209*	-0.00244	-0.00184*
	(0.00190)	(0.00105)	(0.00109)	(0.00166)	(0.00108)
Constant	1.113***	1.016***	0.964***	0.740***	6.891***
	(0.0903)	(0.0577)	(0.0556)	(0.0775)	(0.0542)
Observations	64,344	64,348	64,338	64,351	64,294

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

NB: Models 1-4 are logistic regressions of different aspects of environmental policies, and Model 5 is OLS regression. FEMA 1-10 compared to FEMA 6 the largest of the 10 regions.