

**SHOULD I STAY OR SHOULD I GO? AN ANALYSIS OF WEATHER SOURCE
INFORMATION AND ITS IMPACT ON THE RESPONSE BEHAVIOR OF THE
SOUTHEASTERN U.S AND GULF COAST COASTAL POPULATIONS DURING A
HURRICANE EVENT**

A thesis submitted in partial fulfillment of the requirements for the degree

MASTER OF SCIENCE

in

ENVIRONMENTAL AND SUSTAINABILITY STUDIES

by

**KRISTIN E. SHERLOCK
DECEMBER 2020**

at

**THE GRADUATE SCHOOL OF THE UNIVERSITY OF CHARLESTON, SOUTH
CAROLINA AT THE COLLEGE OF CHARLESTON**

Approved by:

Dr. Matthew C. Nowlin, Thesis Advisor

Dr. Kendra Stewart

Dr. Norm Levine

Dr. Kim Klockow-McClain

Dr. Godfrey Gibbison, Dean of the Graduate School

ABSTRACT

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Hurricanes pose a consistent problem for people in coastal communities, especially the southeastern and Gulf Coast population of the United States. Given the potential for hurricanes to produce high winds, flooding, and tornadic activity, it is imperative for the affected communities to seek shelter and/or evacuate when advised to by local officials. However, there are still people who do not evacuate when it is most important. This poses a major problem for first responders and local rescue workers; putting their lives on the line to provide services to those that did not evacuate. A person's decision to evacuate is influenced by many different factors (Gladwin, *et al.*, 2002). This study focused on the influence of weather information sources on the response behavior of individuals living in coastal communities within the southeastern U.S and Gulf Coast. By analyzing data collected from over 1500 participants of an original survey, I examined the relationship between weather information sources and stated response behavior. I found that more engaged users, that is, users who reported using more than two sources, were more likely to evacuate compared to users who used two information sources or less. It was also determined that local, state and federal emergency managers were most influential on both self-reported evacuated and non-evacuated populations. This information is invaluable to the social behavioral science community, specifically within the weather enterprise and the emergency communication community.

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Chapter 1. Introduction

In 2018 Hurricane Florence hit the Carolinas' coasts as a Category 2 Hurricane and forced state and local governments to send out a mandatory evacuation to over 1 million people (Mindock, 2018). Although the media coverage was widespread, there were residents in the affected area that ignored the evacuation order. This poses a major problem for first responders and local rescue workers who may need to put their lives on the line to provide services to the people that did not evacuate. This also leads to an increase in probability of death and injury for the population that decided to stay behind. While a person's decision to evacuate is influenced by many different factors (Gladwin, *et al.*, 2002), this project focuses on the influence of weather information sources on the response behavior of those living in communities that are vulnerable to hurricanes.

1.1 Dangers of Hurricanes

It is no question that hurricanes in the past 20 years have increased in categorical strength. Lim *et al.* (2018) noted that an unusually warm sea-surface temperature in the Eastern Maine Development Region, where many tropical cyclones that later develop into hurricanes, was one of the key factors that led to the extremely active 2017 hurricane season. This increase in sea-surface temperature is a direct effect of our changing climate. It is important to note that these hurricane events will only continue to increase as well as the resulting hazards that effect coastal communities, specifically the southeastern region of the United States (Scavia *et al.*, 2002). These hazards include storm surge, heavy rainfall and inland flooding, high winds, and in some extreme cases, tornadoes (nhc.noaa.gov, 2019). This is why following evacuation protocol is vital for the safety and survival of coastal populations. Staying behind

during a mandatory evacuation for future hurricane events leads to an increase in the probability of death or injury. It also leads to an increase in the need for first responders and rescue crews during these dangerous events. Ignoring the need to evacuate not only puts that persons' life at risk, but the lives of others.

Storm Surges

Storm surges are the abnormal rise in water, above the predicted astronomical tide (Helderop and Grubestic, 2018). A storm tide is when “the water level rise during a storm due to the storm surge and astronomical tide” (nhs.noaa.gov, 2019). These are produced by the strong winds from a hurricane. Storm surges and storm tides are a major cause of flooding on the coast (nhs.noaa.gov, 2019). Both of these hazards cause large waves, massive erosion of beaches and dunes as well as large infrastructure damage, such as damage to bridges, roads, buildings and residences. Storm surges and storm tides are the greatest threats to life and property during a hurricane event (Helderop and Grubestic, 2019). Figures 1 and 2 show the National Storm Surge Hazards Maps for Category 1 and Category 5 Hurricanes provided by the NOAA/NWS/NHC Storm Surge Unit. As shown, the majority of coastal areas that have been studied in this thesis have been impacted by a storm surge event in some capacity in recent history. These figures show the storm surge impacts as of 2018 to the affected areas.

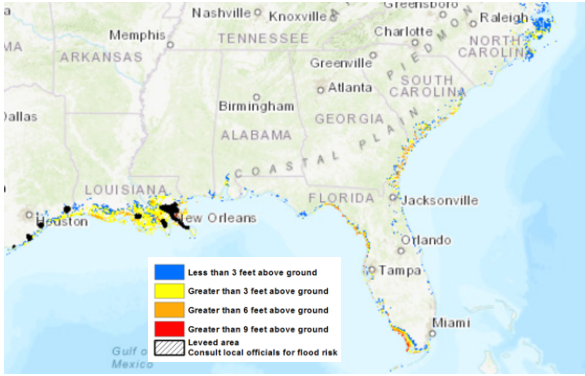


Figure 1: Category 1 hurricane storm surge impact

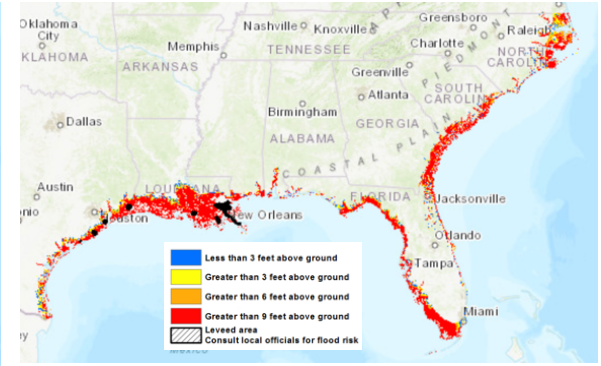


Figure 2: Category 5 hurricane storm surge impact

Heavy Rains and Flooding

Heavy rains and inland flooding are another hazard associated with hurricanes that greatly impact the affected populations. The National Hurricane Center (2019) states that “tropical cyclones often produce widespread, torrential rains, in excess of 6 inches.” Over the 20-year period from 1996 to 2015, a total of 107,743 floods occurred resulting in 1,593 direct fatalities (Lim and Skidmore, 2019). This statistic results in an average of 84 floods per year in the past 30 years due to flooding events (Lim and Skidmore, 2019). One of the most recent hurricane events that caused massive flooding was Hurricane Harvey in 2017.

Hurricane Harvey dumped over 50 inches of rain on Houston, Texas over a three-day period. FEMA reported over 6,500 highway rescues and 122,231 people were rescued by local, state and federal first responders (Tolentino-Serrano, Miller and Karnovsky, 2019). Flooding represents the greatest number of first responder rescue services during a hurricane event.

High Winds

High winds are another hurricane-related hazard that greatly impacts people who choose not to evacuate during a major hurricane event. According to the National Hurricane Center (2019), tropical-storm force winds are strong enough to be dangerous to anyone caught in them. This is why state and local emergency managers plan on having the evacuation plans

complete and in place before approaching tropical-storm force winds arrive. Hurricane-force winds, which are stronger than tropical-force winds, are classified as winds that are 75 mph or more. These winds can not only destroy buildings and mobile homes but can turn loose debris into flying missiles during hurricane events (nhc.noaa.gov, 2019). Between the years of 1995-2007 there were 407 wind-related, tree-falling deaths. 40% of these fatalities were due to high winds during tropical cyclones (Schmidlin, 2009).

Tornadoes

According to the National Hurricane Center (2019), tropical cyclones and hurricanes can also produce tornadoes. They typically occur far away from the center of the hurricane in the flanks of the hurricane structure, most often in the thunderstorms associated with the outer bands of a hurricane. However, in rare events they can occur in the eyewall. Although they are likely to be weak and short-lived, tornadoes are still considered a significant threat during hurricanes and tropical cyclones (nhs.noaa.gov, 2019).

1.2 Hurricane Warning Communication Process

Hurricane warning communication is a complex communication ecosystem. Many factors and people come into play to develop and release hurricane warnings (Demuth *et al.* 2012). The groups include the National Hurricane Center and local weather offices, local emergency managers, and local media such as television and radio personnel. These are the players who identify, synthesize, and release information and warnings to vulnerable communities.

The National Hurricane Center, National Weather Service and Local Weather Offices

The National Hurricane Center (NHC) is the first step and key player in the hurricane warning process. They are the ones who monitor the activity in the Atlantic Ocean and identify areas of concern and the development of tropical storms and hurricanes (NHC, 2020). They are the ones who predict the direction in which it will go, which areas are potentially going to be affected, how strong the hurricane will be and how big it will be (Demuth *et al.*, 2012). The National Hurricane Center partners with the National Weather Service and local weather offices to triangulate their data and identify regions that have a high potential of being affected by the hurricane through the use of regularly scheduled hurricane hotline calls and other communication mechanisms (NOAA, 2017). The local weather offices identify and communicate hurricane threats, however with more of an emphasis at regional and local scales, compared to the NHC, which emphasizes a more national scale. Once a hurricane threat has been identified, these entities provide hurricane forecasts and warnings to emergency managers of the predicted localities that could potentially be affected by this hurricane threat. The main goal of the NHC and NWS is to “provide forecasts and warnings for the protection of life and property and enhancement of the economy” (NOAA, 2020). However, this goal cannot be accomplished by the NWS and NHC alone, which is why there is such a complexity to the hurricane communication ecosystem. They must rely on the local emergency managers as well as local media personnel to accomplish this goal (Demuth *et al.*, 2012).

Emergency Managers

Emergency managers’ primary goal is to “protect the public by informing people at-risk and help keep them out of harm’s way” (Demuth *et al.*, 2012 pg. 1136). Emergency managers are

the ones that obtain the hurricane information and threats directly from the NHC and NWS (Lindell, Prater and Peacock, 2007). Their job is to translate this information and assess the potential impacts on their jurisdiction of the hurricane threat in both physical and societal realms. They must then begin the process of identifying and planning risk reduction actions within their emergency management office. There are several actors that play a role in making decisions about risk-reduction actions, with the main actors being elected officials. Elected officials obtain information from the emergency management office and use that information to make evacuation decisions. Then members of the public, businesses and other governmental and non-governmental actors implement protective actions (Lindell, Prater and Peacock, 2007). Emergency managers have a role in developing hurricane warning communications to save lives and reduce harm. However, they also cannot reach this goal by themselves due to the constraints of their organization and bureaucratic roles (Demuth *et al.*, 2012). They must rely on the media to communicate the NHC and NWS information as well as their recommended risk-reduction actions to the public.

Local Media

The final step in the hurricane warning process includes possibly the most important actors; the local media personnel. Television and radio are the most common sources of hurricane warnings and information for the public vulnerable to the storm (Piotrowski and Armstrong, 1998) Their main role is to synthesize all of the information for the NHC, NWS and local emergency managers into digestible material for the public and communicate it accordingly (Lindell *et al.* 2007). These media personnel are the “everyday faces and voices that serve as a primary conduit for weather warning information to the public” (Demuth *et al.*, 2012,

pg.1137). Media personnel are unique in this communication process in the fact that they are a private organization. Their goals differ in this communication ecosystem since their goal is to maintain market share and generate profit. Although their goal is different from the rest of the actors in the hurricane communication process, they aim to effectively communicate the information and risk of the impending hurricane threats because to do so helps them maintain their audience's trust, therefore meeting their goal (Demuth *et al.*, 2012).

Goal of the Hurricane Warning Process

The hurricane warning process is a complicated communication ecosystem. Every step requires a different actor or group of actors that has different goals compared to the others. These groups have barriers and constraints within each of their organizations, whether it be political or organizational. However, they all share a common goal: to “save lives, reduce injury, property loss, economic disruption and overall harm” during a hurricane event (Demuth, *et al.*, 2012). To do so, they must collaborate and work together.

1.3 Warning to Action Process

The process in which the weather warning turns into action by the affected population has been analyzed and defined to illustrate how warnings are perceived and are then turned to action (Milet and Sorensen, 1988). The first step in the process is hearing the warning itself through different weather warning sources. Once the warning is heard, the next step is to understand the contents of the warning. There are many things that play a part in this step that affect the next portion of this warning to action process, which is believing the warning is credible and accurate. This is a major part of this process in which a person's worldview

and analysis of the world around them is used. After analyzing a warning through checking accuracy and credibility, the person must personalize the warning to oneself, whether that is through checking their locality with regard to the warning or their connection to the source of the warning itself. The next step is for the person to confirm the warning is true, which is the focus of this project. Confirmation is a key component in the warning to action process and may be demonstrated by a person using multiple warning sources to triangulate warning data then decide on a response or even checking in with friends, neighbors, etc. to see how they are responding to the warning. Finally, the last step is taking action such evacuating, going to a community shelter, or sheltering at home.

1.4 Factors that Influence Hurricane Response Behavior

There are many factors that influence a person's decision to evacuate (Gladwin *et al.*, 2002). By and large, studies point to the same set of factors as being important with regard to evacuation. For this study, I focused primarily on sources of weather information while also considering risk perception, previous experience, and demographics. All of these factors are likely to impact a person's evacuation behavior.

Source of Weather Information

The source of weather information is an important factor that might impact a person's evacuation behavior and will be the main focus of this project. Wehde (2019) found that some weather sources, such as electronic and media sources, increase safe action, while sirens actually decrease safe action during tornado events. Adeola (2008) studied Hurricane Katrina (2005) and found that the persuasion of family and close friends positively correlated

to evacuation behavior. Dow and Cutter (1998) found that people used the media more than official authorities as their main source of information during Hurricane Bertha (1996) and Hurricane Fran (1996). Lindell, Lu and Prater (2005) stated that the local news media was most often relied upon during Hurricane Lili. Spence *et al.* (2007) found that television was the most trusted source of information during Hurricane Katrina (2005). However, Baker (1995) found that warnings from local officials had the most influence on evacuation. Burnside (2006) found that warning information from public officials correlated to greater evacuation potential. Overall, the source of a person's warning information plays an integral part in their evacuation behavior.

Risk Perception

Risk perception was one of the most common influences on evacuation behavior. It is defined in this study as a person's perceived risk of themselves in a high-risk event. It is measured in this research as a participants self-reported hurricane concern. Drabek (2001) studied both Hurricane Felix (2007) and Hurricane Fran (1996) and found that risk perception was one of the significant predictors of evacuation behavior. Stein *et al.* (2013) came to the same conclusion when studying Hurricane Rita (2005). During Hurricane Bonnie (1998), Whitehead *et al.* (2000) found that risk perception increased the likelihood that a household would evacuate during a hurricane. However, Bateman and Edwards (2002), who also studied responses to Hurricane Bonnie (1998), found a difference in risk perceptions between men and women. They found that women have a higher risk perception, meaning they perceive themselves at higher risk, than men regarding hurricanes. It is clear that risk perception is one of the biggest influences on evacuation behavior.

Previous Experience

Another factor that might influence evacuation behavior is previous experience with hurricanes. Baker (1979) found that although previous experience is important, it is not a significant factor in predicting evacuation behavior. However, Dow and Cutter (2000) found that during Hurricane Floyd (1999), which impacted the U.S Atlantic coast, the majority of people who evacuated had previously experienced multiple hurricane events in their lifetime. Lindell Kang and Prater (2011) studied Hurricane Lili (2002) and came to a similar conclusion. Solis, Thomas and Letson (2010) studied the whole 2005 hurricane season and found that previous experience increased the likelihood of someone evacuating. While studying future hurricane events, Burnside, Miller and Rivera (2007) found that previous experience with hurricanes was one of the best predictors for evacuation behavior. However, Hasan *et al.* (2011) found that during Hurricane Ivan (2004), previous hurricane experience decreased the likelihood of evacuating. As these studies indicate, previous experience is an important factor to look into when studying factors that influence evacuation behavior, however, the findings seem to be inconsistent across studies.

Demographics

The demographics of an individual play a vital role in their evacuation behavior. Specifically, evacuation behavior seems heavily dependent of gender, ethnicity, and income. Dixit *et al.* (2008) found that during Hurricane Frances (2004), households with high incomes took the longest to evacuate. Spence *et al.* (2007) found similarly, that people in higher income brackets are less likely to be prepared for a hurricane. However, Thiede and Brown (2013)

found that lower income predicted a decrease in likelihood of a person to evacuate. In terms of ethnicity, there are also conflicting findings. Elliot and Pais (2006), Spence *et al.* (2007) and Thiede and Brown (2013) studied Hurricane Katrina (2005) evacuation behavior and found that people who reported African American as their race were less likely to evacuate than other reported races. However, Van Willigenn (2005) studied the evacuation behaviors during Hurricane Floyd (1999) and found that both lower income and Black racial identity increased a person's likelihood of evacuating during this event. Yet, Zhang, Prater and Lindell (2004) found that white racial identity increased the likelihood of a person evacuating. In terms of gender, most studies found that females have a higher likelihood of evacuating during a hurricane than males. Elliot and Paris (2006) found that males were less likely to evacuate during Hurricane Katrina (2005). Smith and McCarty (2013) studied the 2004 hurricane season and found that being female increased the likelihood of evacuating. Overall, it appears as though the demographic of an individual does have a significant impact on their evacuation behavior, but the findings vary across studies and across storms with regard to the impacts of income and race, therefore their impact have been inconclusive.

Chapter 2. Methods

The data for this study come from a public opinion survey. Survey methods are typically used to gather information “about the characteristics, behaviors and/or attitudes of a population” (McLafferty, 2010). This was chosen to be the most effective way to collect demographic data, as well as data that would give details about the stated evacuation behavior of a population. The target population of this survey was residents in coastal communities in the Southeast and Gulf Coast regions of the United States. This includes North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Texas, and Louisiana. This population was chosen to analyze due to their vulnerability and history with hurricane events, and they are the most likely to be given an evacuation summons during a major hurricane.

2.1 Data Collection

Survey respondents came from participants recruited by Qualtrics. Respondents were 18+ and they were allowed to withdraw at any time. The sampling method used when collecting these data was stratified sampling. Rice (2010) defines stratified sampling as “a number of homogeneous sub-groups, or strata, differentiated by some relevant characteristic, are recognized within the population.” These questions were designed to identify and equally distribute our sampling, therefore reducing the probability of oversampling relative to US Census data. Specifically, this study used proportionate stratified sampling, which means that the number of persons included in the survey were drawn from distinctive strata in proportion to their true size in the population (Rice, 2010). This was done using the quota tool within the Qualtrics Online Survey Platform.

2.2 Variables

Hurricane Evacuation

The main dependent variable for this thesis is self-reported warning response behavior. The following question was used for analysis:

The National Hurricane Center has indicated that a **Category 2 hurricane**, with winds of 96-110 miles per hour, is likely to impact your local area.

Which of the following most accurately describes what you would do?

Nothing

Move to the most sheltered part of your residence when the storm approaches, but do not leave your residence

Move to an evacuation shelter in your community

Leave your residence and drive away from the hurricane warning area, that is *evacuate*

Other (please specify) _____

Given the categorical nature of the dependent variable, for the analysis I used a multinomial logistic regression model, with *do nothing* as the referent category, to examine stated evacuation behavior. Multinomial logit regression is used when there are multiple possible outcomes of a dependent variable given a set of independent variables. The dependent

variable that was analyzed using a multinomial logit is the multiple actions response question above. The results show the likelihood that the respondent would choose the other actions compared to the base-line action of Nothing. Additionally, those that answered “other” were able to be placed in one of the other categories by coded their verbatim answers.

Information Sources

The main independent variable for this thesis is the sources of weather information on which the respondents rely. The following question will be used:

Which of the following sources do you use to get information about the WEATHER? Please check all that apply.

Newspapers

Non-government Internet websites (such as weather.com)

Government sponsored Internet websites (such as noaa.gov)

Local TV (television) news

Cable TV (television) news (such as The Weather Channel)

Radio

Family, friends or colleagues

Social Media, such as Facebook and Twitter

Cell phone applications or automated text messages

Other (please specify)

To determine the types and categories of information sources, I used a Latent Class Analysis (LCA). Latent class analysis is primarily used to categorize and structure data (Wehde, 2019). In terms of this study, I used LCA to categorize the underlying structure associated with weather information sources. This analysis illustrated any patterns associated with the various types of weather information sources that respondents use.

Additionally, I controlled for other factors that previous research has shown to be important predictors of hurricane response behavior including previous experience, risk perception, and demographics.

Hurricane Concern

To measure hurricane concern, I used the following question:

Listed below are several issues that may impact the natural environment and human health.

On a scale from 0 to 10, with **0** being *not at all concerned* and **10** being *extremely concerned*, how concerned are you about...

[An increase in the intensity of hurricanes]

Past Hurricane Damage

Past hurricane damage was measured using the following question:

Has your home ever been damaged by a hurricane? Either wind or water damage.

No

Yes

Evacuated Before

Evacuated before was measured with this question:

Have you ever left your home for someplace safer to avoid a major natural disaster; that is have you ever evacuated?

No

Yes

Distance to Coast

To measure distance from the coast, I first geolocated the respondents of the survey using their zip code data. I then introduced a shapefile of the map of the coastlines. The approximated coordinates of the coastline are then plotted. By doing so, I was able to identify each respondents' approximated distance to the coast by calculating the distance between the geolocated data points of the respondents and the approximated coastline data points by creating a continuous distance variable, which identified each respondents' distance to the coast (Jones, 2019).

Household Preparations

Household preparations were measured with this question:

How prepared do you feel your *household* is to cope with future severe weather events?

Not at all prepared (1)

Somewhat unprepared (2)

Unsure (3)

Well prepared (4)

Very well prepared (5)

Finally, I controlled for age, gender, race/ethnicity, education, and income.

Descriptive Statistics

Descriptive Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Hurricane Concern	1,520	7.700	2.612	0	10
Past Hurricane Damage	1,519	0.444	0.497	0.000	1.000
Evacuated Before	1,520	0.588	0.492	0	1
Distance to Coast	1,498	14.312	24.457	0.641	269.683
Household Prep	1,520	3.634	0.967	1	5
Age	1,520	48.497	17.450	18	90
Male	1,520	0.491	0.500	0	1
White	1,520	0.718	0.450	0	1
Education	1,520	4.766	1.781	1	7
Income	1,520	4.646	3.629	1	12

Table 1: Descriptive Statistics

The descriptive statistics of the sample of users who participated in the survey is shown above. A user's hurricane concern on a scale from 0 to 10 averaged a 7.7 with a standard deviation of 2.6. This shows that the population in which was sampled has, on average has significant concern when it comes to hurricane events. On average, 44% of the participants of

the survey stated they have experienced past hurricane damage. About 58% of the participants stated that they have evacuated before during a hurricane event. In a range of 1 to 5, the average participant reported a 3.634 in terms of preparing their household for a hurricane. This states that, on average, the sample population has significantly prepared their household for a hurricane event. The average age of the users who participated in the survey is 48 years old, with a standard deviation of 17.45, where the age range was 18-90. It was found that 49% of the participants of the survey were male, with a standard deviation of .5. About 72% of the participants were white, with a standard deviation of .45. The average education of the sample population was between some college to receiving a 2 year associates degree. Finally, the average income for the sample population was between \$60,000 to \$99,999 for the year of 2017.

These are the variables that were used in the multinomial logit analysis. This analysis examines these variables which affect evacuation behavior by identifying their influence on evacuation behavior. These behaviors include evacuate, go to a community shelter and shelter in home. To determine their influence, these actions are compared to a baseline of “do nothing” resulting in either a positive result, indicating that the statistically significant factor is more likely to result in that specific action taken, or a negative result, indicating that the statistically significant factor is less likely to result in that specific action compared to “do nothing.” I also examined reasons for not evacuating.

Reasons for Not Evacuating

I then examined reasons that respondents stated for not evacuating. First, I examined descriptive statistics for the following question:

Below are a list of reasons why some people might have for not evacuating the area where they live if there were a major natural disaster. For each one, *please indicate if it is a reason why you would not/might not evacuate.*

	Yes (1)	No (2)	Don't know (3)
You don't know where to go (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You don't have adequate transportation (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You have medical or physical problems that would make it difficult to leave (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You have to take care of someone who would be physically unable to leave (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You would be worried your possessions would be stolen or damaged if you left (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You would not want to leave your pet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You would not be able to afford to leave (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You would not be able to leave your job (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You think your home is well-built and you will be safe at home (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You think evacuating would be dangerous (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You think the roads would be too crowded to leave (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Table 2: Reasons for Not Evacuating Question

Second, I examined open-ended responses that respondents gave as to why they didn't evacuate. In the survey, respondents were asked whether they had ever stayed in their home when their area was advised to evacuate. Overall, 57 percent of respondents indicated that they have stayed home when advised to leave, and those respondents received a follow-up, open-ended question about why they decide not to evacuate. I then coded those responses into one of several categories. The codebook can be found in Appendix A.

Below is a list of people that may encourage you to evacuate due to the **hurricane**.

- Would you be *more or less likely to evacuate if encouraged by ...*
 - Extremely unlikely (1)
 - Moderately unlikely (2)
 - Slightly unlikely (3)
 - Neither likely nor unlikely (4)
 - Slightly likely (5)
 - Moderately likely (6)
 - Extremely likely (7)

Finally, I identified and examined the sources in which the respondents were most influenced in their reported evacuation behavior then the above question was prompted. First the respondents were divided into two groups: evacuated users and non-evacuated users. Then the sources in which they identified as influential were ranked based on populous of response. I then divided up the sources of information into four different “actor” groups:

local actors, state actors, federal actors and social actors. Using an Ordinary Least Squares (OLS) statistical technique, I was able to examine the variables with each source actor to determine which variables were more influential within these four source actor groups.

Chapter 3. Results

Due to the scope of this study, I have come to find multiple results. I identified 4 classes of users within the target population of this survey, which led to finding which class, or group, was most likely to evacuate using the LCA. I then was able to conclude which action was most used as well as least used, during a hurricane evacuation. I was also able to identify the main reasons why participants who did not evacuate chose not to. I then was able to identify the most influential actors on both evacuated and non-evacuated users. Finally, I have found which source actors affect the users that did evacuate as well as the users that did not evacuate using the OLS Analysis.

3.1 Latent Class Analysis

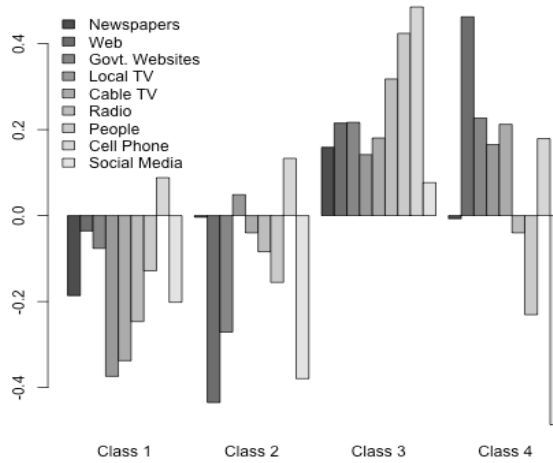


Figure 3: Latent Class Analysis Results

The results of the Latent Class Analysis (LCA) is presented in Figure 3. Overall, I found four main classes of weather information users. Figure 3 shows how each of the four classes differ from the average. The first class, Class 1, are participants that exclusively use cell phones more than average. Class 2 are participants that use both cell phone and television communication more than average. Class 3 are participants that use every communication medium more than average. Finally, Class 4 are participants that use web sources more than average. Using this method of categorizing the participants, I am able to identify the group, or class, whom are more likely to evacuate compared to the others. For the analysis, I created dummy variable for each class and used class 3, the most engaged users, as the excluded referent group.

3.2 Hurricane Response Actions

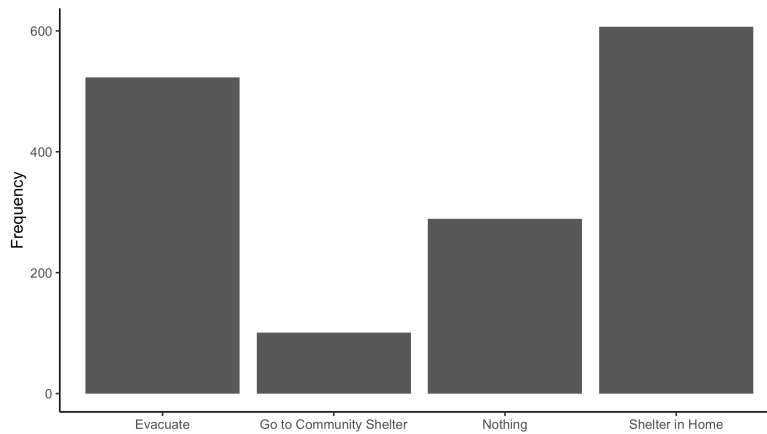


Figure 4: Response Actions Results

The main dependent variable for this project is self-reported hurricane response action from the users of the survey. As can be seen in Figure 4, the majority of the users sheltered at home during hurricane warnings. The next most popular action was to evacuate the affected

area of the warning. Over 200 of our participants, stated that they would do nothing during a category 2 hurricane. Finally, the least used action that was reported was going to a community shelter. This information shows that most of our participants are likely to shelter at home and that our sample population are more likely to do nothing during a hurricane evacuation than go to a community shelter.

Multinomial Logit Analysis

Multinomial Logit Estimates of Stated Evacuation Behavior

	<i>Dependent variable:</i>		
	Evacuate	Community Shelter	Shelter in Home
	(1)	(2)	(3)
Cell Only Users	-0.168 (0.244)	-0.319 (0.356)	-0.166 (0.225)
Cell and Local TV Users	-0.396 (0.211)	-0.626* (0.308)	-0.551** (0.198)
Web Users	0.202 (0.272)	-0.718 (0.516)	0.169 (0.259)
Hurricane Concern	0.191*** (0.031)	0.131** (0.049)	0.096*** (0.027)
Past Hurricane Damage	0.111 (0.163)	-0.125 (0.254)	0.128 (0.153)
Evacuated Before	1.512*** (0.171)	0.544* (0.252)	0.168 (0.153)
Distance to Coast	0.001 (0.003)	0.003 (0.004)	0.0004 (0.003)
Household Prep	-0.032 (0.084)	-0.117 (0.119)	0.066 (0.079)
Age	0.017** (0.005)	0.005 (0.008)	0.007 (0.005)
Gender (Male=1)	-0.226 (0.172)	-0.229 (0.265)	-0.312 (0.161)
Race (White=1)	-0.320 (0.190)	-1.465*** (0.269)	0.195 (0.179)
Education	-0.022 (0.050)	-0.135 (0.075)	0.021 (0.046)
Income	0.070** (0.026)	0.021 (0.044)	0.040 (0.024)
Constant	-2.294*** (0.513)	-0.355 (0.724)	-0.685 (0.462)
Akaike Inf. Crit.	3,440.843	3,440.843	3,440.843

Note: * p<0.05; ** p<0.01; *** p<0.001

Table 3: Multinomial Logit Analysis Results

I conducted a multinomial logit analysis to find which factors influence evacuation behavior such as evacuate, go to a community shelter or shelter in home compared to doing nothing and the results are shown in Table 3. I found that cell phone and local television users are less likely than those that consume weather information from multiple sources to shelter in home compared to do nothing. Hurricane concern is a big factor in evacuation behavior. Users reported that they are more likely to evacuate, go to a community shelter, or shelter in home compared to doing nothing depending on their hurricane concern. Users who reported that they evacuated before are more likely to evacuate again in the event of a hurricane. Users who reported their race as white are less likely to go to a community shelter than do nothing. Finally, increasing income is shown to influence evacuation more positively compared to do nothing. All other factors were considered statistically insignificant.

Reasons for Not Evacuating

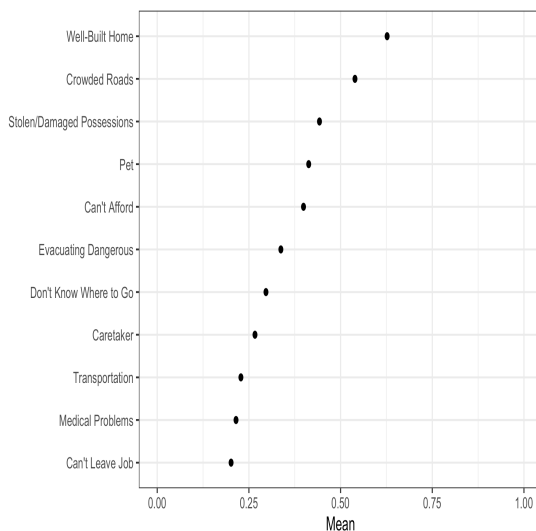


Figure 5: Reasons for not evacuating



Figure 6: Word Cloud of Open-ended Question

To analyze the users reasoning for not evacuating I analyzed both through Rstudio for the multiple-choice question as well as created and used a codebook for the open-ended question to triangulate the data and find any commonalities between the responses. This study did find that both analysis showed that users who did not evacuate felt safe at home, did not have a place to go, as well as felt as though they could not leave because of their pets. As can be seen we did have some differences in responses between both the multiple answer question as well as the open-ended question.

With the multiple-choice question, the leading answers were somewhat different to the open-ended question. This is most likely due to the fact that the user could go into more detail in the open-ended question compared to the multiple-choice question. As seen in the graph above for the multiple-choice answers from our users, the other top choices that did not triangulate with the codebook were crowded roads, stolen-damaged goods, evacuating dangerous, transportation, medical problems and can't leave job. These answers show that the users overall feel that evacuating is more dangerous than staying put during a hurricane warning.

As can be seen in the codebook in Appendix A, I was able to get more data as well as a better insight into the users reasoning for not evacuating through using their own words. The word cloud above in Figure 6, shows the most popular words found in the open-ended responses. The results showed through the use of coding that risk perception was the number one reason for not evacuating. Users did not feel they were at-risk during an evacuation, therefore stayed behind. The user's perception of the storm as well as the strength of the hurricane were also big factors in not evacuating. The users also stated that their locality to the hurricane itself

also deterred them from evacuating. Also, some users felt as though if anyone in their immediate social circle (family, friends, neighbors, etc.) were not evacuating, they chose to not evacuate. Finally, another major factor in choosing not to evacuate was the user's financial status. A lot of users who did not evacuate could not afford to, or thought that evacuating would put a strain on their finances.

Warning Source Influence: Evacuated vs. Non-Evacuated Users

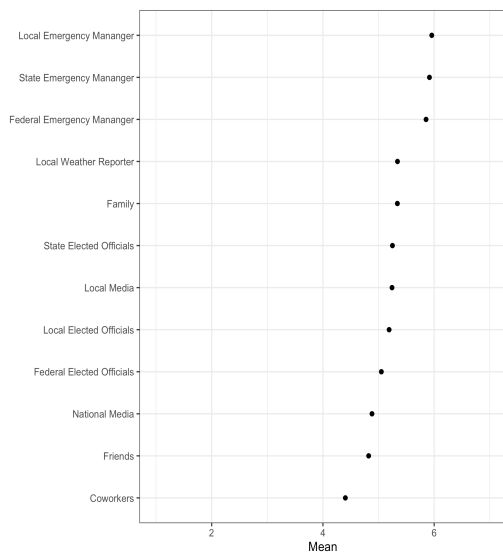


Figure 7: Warning Source Influence Evacuated Users

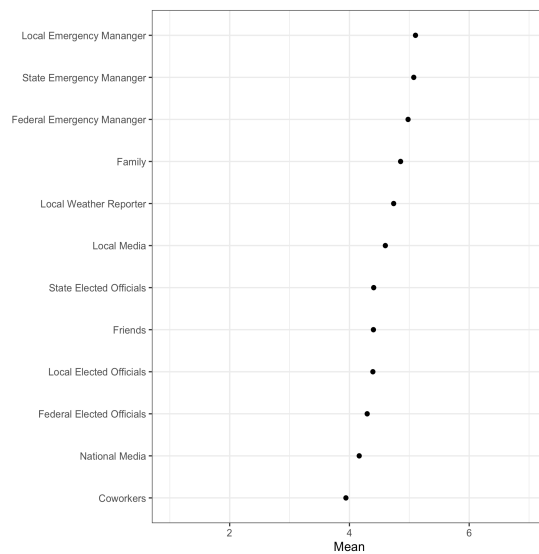


Figure 8: Warning Source Influence Non-Evacuated Users

In this survey, I listed and identified actors who are the source of hurricane warnings. These are local emergency managers, state emergency managers, federal emergency managers, local weather reporters, local media, local elected officials, federal elected officials, state elected officials, national media, family, friends and coworkers. I analyzed source actor rankings for both users who evacuate as well as users who do not evacuate. I found that in

both evacuated and not evacuated populations that the three most influential sources are local emergency managers, state emergency managers as well as federal emergency managers, in that order. I found in both groups that coworkers the least influential when deciding on evacuation behavior.

After these source actors is where there is some variation between the two groups. Users who evacuated were more likely to get their hurricane warning information from local weather reporters over their family, however users who did not evacuate, were more likely to get their warning information from family over local weather reporters. Users who reported evacuation relied more on state elected officials, local media and local elected officials more than users who reported not evacuating. It appears in the data that users who reported not evacuating are more likely to listen to their social circle, such as family and friends more than users who reported evacuation. These results shine a light on the most influential warning sources, which are the emergency managers at the federal, state and local levels. This information is crucial to know for future hurricane warnings.

3.3 OLS Analysis

To analyze the different sources of information that our users marked as sources, I used OLS to divide the sources into four different groups. The first group are the local actors, which include local weather reporters, local media, local emergency manager, and local elected officials. The second group are the state actors, which include state emergency officials and state elected officials. The next group are the federal actors, which include federal emergency managers, federal elected officials, and national media. Finally, the last group are the social actors, which include friends, family, and coworkers.

OLS Estimates of Local Actors

	<i>Dependent variable:</i>			
	Weather Reporter	Media	Emergency Manager	Elected Officials
	(1)	(2)	(3)	(4)
Not Evacuated	-0.551 ^{***} (0.083)	-0.601 ^{***} (0.084)	-0.771 ^{***} (0.078)	-0.766 ^{***} (0.088)
Cell Only Users	-0.455 ^{***} (0.122)	-0.471 ^{***} (0.125)	-0.405 ^{***} (0.115)	-0.367 ^{**} (0.130)
Cell and Local TV Users	0.031 (0.105)	-0.140 (0.107)	-0.239 [*] (0.098)	-0.210 (0.111)
Web Users	-0.107 (0.127)	-0.198 (0.130)	-0.081 (0.120)	-0.242 (0.135)
Hurricane Concern	0.127 ^{***} (0.016)	0.117 ^{***} (0.016)	0.122 ^{***} (0.015)	0.115 ^{***} (0.017)
Past Hurricane Damage	0.106 (0.081)	0.128 (0.083)	0.045 (0.076)	0.187 [*] (0.086)
Distance to Coast	0.001 (0.002)	0.002 (0.002)	-0.002 (0.002)	-0.0001 (0.002)
Household Prep	-0.026 (0.043)	-0.004 (0.044)	-0.033 (0.040)	0.017 (0.046)
Age	-0.001 (0.003)	0.001 (0.003)	0.003 (0.003)	-0.002 (0.003)
Gender (Male=1)	-0.069 (0.088)	-0.112 (0.090)	-0.256 ^{**} (0.083)	-0.007 (0.094)
Race (White=1)	-0.237 [*] (0.096)	-0.290 ^{**} (0.098)	-0.203 [*] (0.090)	-0.286 ^{**} (0.102)
Education	0.054 [*] (0.025)	0.017 (0.026)	0.082 ^{***} (0.024)	0.043 (0.027)
Income	-0.006 (0.012)	0.005 (0.013)	0.006 (0.012)	-0.003 (0.013)
Constant	4.497 ^{***} (0.263)	4.536 ^{***} (0.269)	4.987 ^{***} (0.248)	4.427 ^{***} (0.279)
Observations	1,493	1,493	1,493	1,493
Adjusted R ²	0.101	0.094	0.148	0.099

Note:

* ** ***
p p p<0.001

Table 4: OLS Analysis of Local Actors

The local actors, have the most actors out of all of the source groups. It was found that users who reported that they have not evacuated are less likely to evacuate if influenced by local weather reporters, local media, local emergency managers, and local elected officials. Cell phone only users were found to be less likely to evacuate if told by local weather reporters, local media, local emergency managers, and local elected officials. Users that reported hurricane concern were more likely to evacuate if they received hurricane warnings from local weather reporters, local media, local emergency managers, and local elected officials. Users who reported being male were less likely to evacuate if told by local emergency managers. Users who reported white as their race are less likely to evacuate if being told by local weather reporters, local media, local emergency managers and local elected officials. Finally, education was found to be positively correlated with warnings from local emergency managers, meaning that the more educated users are, the more likely they are to evacuate if told by their local emergency managers. All other factors were found to be statistically insignificant.

OLS Estimates of State Actors

<i>Dependent variable:</i>		
	Emergency Manager Elected Officials	
	(1)	(2)
Not Evacuated	-0.792*** (0.079)	-0.820*** (0.086)
Cell Only Users	-0.401*** (0.117)	-0.302* (0.128)
Cell and Local TV Users	-0.205* (0.101)	-0.168 (0.109)
Web Users	-0.040 (0.122)	-0.270* (0.133)
Hurricane Concern	0.107*** (0.015)	0.118*** (0.017)
Past Hurricane Damage	0.135 (0.078)	0.188* (0.085)
Distance to Coast	0.001 (0.002)	0.002 (0.002)
Household Prep	-0.045 (0.041)	-0.042 (0.045)
Age	-0.002 (0.003)	-0.004 (0.003)
Gender (Male=1)	-0.119 (0.085)	0.042 (0.092)
Race (White=1)	-0.309*** (0.092)	-0.341*** (0.101)
Education	0.052* (0.024)	0.020 (0.027)
Income	0.006 (0.012)	-0.0002 (0.013)
Constant	5.394*** (0.253)	4.877*** (0.275)
Observations	1,493	1,493
Adjusted R ²	0.129	0.115

Note: * p < 0.05 ** p < 0.01 *** p < 0.001

Table 5: OLS Analysis of State Actors

The state actors, which as stated prior, are state emergency managers and state elected officials. Users who reported that they did not evacuate are less likely to evacuate if being told by state emergency managers and state elected officials. Cell phone only users are less likely to evacuate if being told by state emergency managers and state elected officials. Users who reported using cell phone and local television are less likely to evacuate if being told by state emergency managers. Hurricane concern was found to be positively correlated with both state emergency managers and state elected officials, which means that users who reported hurricane concern are more likely to evacuate if being told by both state emergency managers and state elected officials. Users who reported past hurricane damage are more likely to evacuate if told by state elected officials. Users who reported white as their race are less likely to evacuate if told by state emergency managers and state elected officials. Finally, education was found to be positively correlated with state emergency managers, which means that the more educated users are more likely to evacuate if being told by state emergency managers. All other factors were found to not be statistically significant.

OLS Estimates of Federal Actors

	<i>Dependent variable:</i>		
	Emergency Manager	Elected Officials	National Media
	(1)	(2)	(3)
Not Evacuated	-0.821*** (0.080)	-0.730*** (0.090)	-0.655*** (0.088)
Cell Only Users	-0.545*** (0.118)	-0.314* (0.133)	-0.266* (0.130)
Cell and Local TV Users	-0.327** (0.101)	-0.249* (0.114)	-0.073 (0.111)
Web Users	-0.194 (0.123)	-0.332* (0.139)	-0.159 (0.135)
Hurricane Concern	0.125*** (0.015)	0.110*** (0.017)	0.167*** (0.017)
Past Hurricane Damage	0.156* (0.078)	0.259** (0.088)	0.202* (0.086)
Distance to Coast	-0.003 (0.002)	-0.001 (0.002)	0.002 (0.002)
Household Prep	-0.068 (0.041)	-0.032 (0.047)	-0.014 (0.046)
Age	-0.002 (0.003)	-0.006 (0.003)	-0.008** (0.003)
Gender (Male=1)	-0.095 (0.085)	0.014 (0.096)	-0.052 (0.094)
Race (White=1)	-0.461*** (0.093)	-0.443*** (0.105)	-0.603*** (0.102)
Education	0.069** (0.025)	0.037 (0.028)	0.022 (0.027)
Income	0.009 (0.012)	-0.003 (0.014)	-0.019 (0.013)
Constant	5.429*** (0.254)	4.832*** (0.287)	4.452*** (0.279)
Observations	1,493	1,493	1,493
Adjusted R ²	0.164	0.103	0.154

Note:

* ** *** p p p<0.001

Table 6: OLS Analysis of Federal Actors

The federal actors, which stated prior, are federal emergency managers, federal emergency managers and national media. Users who reported that they did not evacuate are less likely to evacuate if told by federal emergency managers, federal elected officials and national media. Cell phone only users are less likely to evacuate if told to do so by federal emergency managers, federal elected officials and national media. Cell phone and local television users are less likely to evacuate if told by federal emergency managers and federal elected officials. Users who reported hurricane concern are more likely to evacuate if told by federal emergency managers, federal elected officials and national media. Users who reported past hurricane damage are more likely to evacuate if told by federal emergency managers, federal elected officials and national media. Age was found to have a negative correlation with national media, which means that the users who reported a higher age are less likely to evacuate if told by the national media. Users who reported white as their race are less likely to evacuate if told by federal emergency managers, federal elected officials and national media. Finally, education is positively correlated with federal emergency managers, which means that the more educated a user reported they are, the more likely they are to evacuate if told by federal emergency managers. All other factors were found to be statistically insignificant.

OLS Estimates of Social Actors

	<i>Dependent variable:</i>		
	Friends (1)	Family (2)	Coworkers (3)
Not Evacuated	-0.413*** (0.083)	-0.443*** (0.085)	-0.454*** (0.086)
Cell Only Users	-0.390** (0.122)	-0.409** (0.125)	-0.488*** (0.127)
Cell and Local TV Users	-0.342** (0.105)	-0.370*** (0.107)	-0.345** (0.109)
Web Users	-0.450*** (0.127)	-0.383** (0.130)	-0.557*** (0.132)
Hurricane Concern	0.104*** (0.016)	0.092*** (0.016)	0.078*** (0.017)
Past Hurricane Damage	0.208* (0.081)	0.118 (0.083)	0.123 (0.084)
Distance to Coast	-0.0001 (0.002)	-0.001 (0.002)	0.003* (0.002)
Household Prep	-0.079 (0.043)	-0.053 (0.044)	-0.051 (0.045)
Age	-0.007** (0.003)	-0.008** (0.003)	-0.017*** (0.003)
Gender (Male=1)	0.128 (0.088)	-0.052 (0.090)	0.188* (0.092)
Race (White=1)	-0.071 (0.096)	-0.147 (0.099)	-0.011 (0.100)
Education	0.053* (0.025)	0.051 (0.026)	0.081** (0.026)
Income	0.004 (0.012)	0.013 (0.013)	0.009 (0.013)
Constant	4.552*** (0.264)	5.235*** (0.270)	4.479*** (0.273)
Observations	1,493	1,493	1,493
Adjusted R ²	0.076	0.071	0.087

Note: * ** *** p p p <0.001

Table 7: OLS Analysis of Social Actors

Social actors, as stated prior, are friends, family, coworkers. Users who reported that they have not evacuated are less likely to listen to friends, family or coworkers. Cell phone only users are less likely to evacuate if told by friends, family or coworkers. Cell phone and local television users are less likely to evacuate if told by friends, family or coworkers. Web users were found to be less likely to evacuate if told by friends, family or coworkers. Users who reported hurricane concern are more likely to evacuate if told by friends, family and coworkers. Users who reported past hurricane damage are more likely to evacuate if told by friends compared to family or coworkers. Users who reported their distance to coast are more likely to evacuate if told by coworkers compared to family or friends. The age of our users is negatively correlated with family, friends or coworkers, meaning that users reporting higher ages are less likely to evacuate if told by family, friends or coworkers. Users who reported being male are more likely to evacuate if told by coworkers compared to family or friends. Finally, education was positively correlated with friends and coworkers, meaning the more education users reported the more likely they are to evacuate if told by friends and coworkers compared to family. All other factors were found to be statistically insignificant.

Chapter 4. Discussion

4.1 LCA Class Analysis

Research in the source of weather information has varied much throughout recent history. Many studies have been done, with a multitude of different findings. I have found, using Latent Class Analysis, as stated prior, that more engaged users of the survey were more likely to evacuate compared to cell phone only users, cell phone and local television users, as well as web only users. These findings correlate with the current research in this area. As stated in the prior, the source of weather information is a big factor on evacuation behavior. All of these different studies have concluded one influential source as superior to others, from the Adelo (2008) study that concluded the persuasion of friends and family positively correlated to evacuation behavior to Dow and Cutter (1998) which concluded that people use media more than official authorities in their study. Due to these conflicting findings, it can be seen that finding a single source of information that greatly impacts evacuation behavior over others, is difficult, if not impossible to find. I have found, using latent class analysis, that users who are the most engaged, meaning that they use multiple sources of information, are more likely to evacuate compared to do nothing. This shows that all of these past studies are correct in their findings in a way. Dependent upon the year and the storm, all of the findings of the studies done in the past have found different sources to be more influential compared to others. This study adds to this as to not necessarily look at individual sources per say, but

look at the bigger picture and identify users who use multiple sources to triangulate the information being disseminated and decide on taking safe action.

4.2 Evacuation Actions and Dangers of Hurricanes

As can be seen in the results above, the most reported action taken during a hurricane warning was taking shelter at home. Although it was found that people feel safest at home, there are many dangers that come with it. The dangers that the users that reported sheltering at home include heavy rain and storm surges that leads to dangerous flooding events, as well as high wind speeds and tornadic events. These dangers are a major threat to human life and sheltering at home could lead to disastrous outcomes. A positive outcome that was found that next to sheltering in home, evacuating during a hurricane was the second most popular action taken. This means that a major portion of the users of the survey, that live in areas most vulnerable to hurricanes and the dangers that come along with it, take safe action and evacuate. A more concerning finding was that doing nothing during a hurricane event is more popular than going to a community shelter, which as seen above, was the least popular decision made during an evacuation. After analyzing the open-ended question that 835 of our users answered which asked why they did not evacuate or take safe action during a previous hurricane event, the majority of them stated that when it comes to community shelters, they are generally known to be perceived as “unsafe” or “dangerous”. This answers the question as to why users of this survey are more likely to do nothing than to go to a community shelter.

4.3 Multinomial Logit Analysis

For the multinomial logit analysis, I found multiple sources of hurricane warning information as well as factors that influence evacuation behavior. It was found that users who relied on cell phone and local television sources are less likely to shelter in home than do nothing. This result compared to Wehde (2019), who found that electronic and media sources increase safe action, shows that there is a disparity between the two studies. The users in the survey analyzed through this study showed that users who use electronics such as cell phones and local media were less likely shelter in home than do nothing, while Wehde (2019)'s results found the opposite. This result also opposes all of the other studies in this area which found electronic sources and media to have a positive correlation to evacuating or taking safe action during a hurricane. This is most likely due to a change in mindset when it comes to local media and electronic information. The studies that were reviewed and analyzed prior to this study were conducted before the "fake news" era, which we are in now. Demuth *et al.* (2012) stated in their breakdown of the hurricane warning communication process that each organization that is involved in the process, each has their own goal, which differs between them. In the current state of our society, information sources have been more transparent in the goals in which they want to obtain by disseminating information, thus showing more of the disparity between the goals for each organization. This then leads to more of a distrust in information sources within society now than there has been in the past, which illustrates that the results of these findings are to be expected.

Hurricane concern was found to be a major factor that influences evacuation behavior. Users reported that they are more likely to take safe action, that is, to evacuate, go to a community shelter, or shelter in home compared to doing nothing. A user's concern about a hurricane

illustrates their risk perception, which Drabek (2001) found to be one of the most common influences on evacuation behavior. Hurricane Concern was one of the most statistically significant factors, which makes sense due to a person's perceived risk in a dangerous situation, such as a hurricane, greatly influences their behavior. These results align well with previous research done in this area.

Another factor that was found to be statistically significant was a user's previous experience in evacuating. It was found in this study that if a user evacuated before, they are more likely to evacuate again compared to doing nothing. Dow and Cutter (2000) found that the majority of people who evacuated for Hurricane Floyd (1999) had previously experienced multiple hurricane events. The results of this study align with the same conclusion. In order for our user's to have evacuated prior to a hurricane, they must have previously experienced a hurricane in their lifetime, therefore illustrating that previous experience in evacuating is found to be a positive significant factor when it comes to evacuating.

In terms of demographic data, both race and income were found to be statistically significant. It was found that users who reported their race as white were less likely to go to a community shelter than do nothing. Also, a user's income positively influences their action to evacuate compared to do nothing. Both of these demographic influences show similar conclusions to past research. Thiede and Brown (2013) found that lower income predicted a decrease in likelihood of a person to evacuate, which is reflected in the positive influence income has on a user's evacuation behavior. The higher the income of a user, the more likely they are to evacuate and vice versa. In terms of race, there has been conflicting findings in the behaviors taken during a hurricane. Thiede and Brown (2013) found that people who reported black as their race, were less likely to evacuate, however Van Willigenn (1999) found that people who

reported black as their race had an increased likelihood of evacuating. Because of these conflicting findings, the results do not align much with prior research, however it does illustrate that users who reported white as their race are more likely to do nothing during a hurricane than go to a community shelter.

4.4 Reasons for Not Evacuating

There are many reasons that people in vulnerable areas do not evacuate during hurricane events. This study's survey used two different methods of collecting the data to attempt to find any commonalities between them. The multiple-choice answer found that the number one reason for users who did not evacuate was due to their perception of having a well-built home, thus leading them to shelter in place, which as stated earlier was the most popular action taken of the target population during a hurricane. This survey also prompted an open-ended question to the 835 respondents, which is about 55% of the target population, who stated that they did not evacuate in the past storm. This question led to similar responses as well as some outlying reasons as well. The main reason found through the open-ended question was the user's risk perception. Most of the respondents stated that they did not feel they were in danger during a hurricane event. This lack of risk perception may also lead to respondents sheltering in home during a hurricane event, which aligns with the data collected through the multiple-choice question.

Other popular answers from the multiple-choice question were that the respondents feared crowded roads, which was the only other response that was above the mean. This illustrates that the target population does not feel confident in the logistics of evacuations that are prepared by local emergency management. This fear of crowded roads is a major reason for

not evacuating as the media often depicts evacuation routes as looking as stand-still traffic and builds fear in people that they may run out of gas and resources while stuck in these crowded roads. These responses align with the research done by Sankar, Doshi and Goodie (2020) where they found a few of the key variables to their decision-making model, which analyzes the reasons for why people stay behind during evacuations, to be “preparation to stay” as well as “traffic”.

The codebook illustrates the second major reason as to why respondents don't evacuate is tied with their perception of the storm itself as well as the hurricane strength. This survey was conducted in the most vulnerable areas of the United States, which as stated earlier is the southeastern portion as well as the Gulf coast. This population has had significantly more experience with hurricane events as compared to other parts of the United States. A lot of the open-ended responses, showed that users have certain rules regarding evacuation during a hurricane. Most of it regarding the strength as well as their actual perception of the storm itself, which go hand in hand. A majority of the respondents that fell into these categories stated that they felt if a hurricane was a certain category or under, they perceived that the storm would not affect them as harshly, therefore leading them to stay home.

There were also some interesting and still significant reasons that were found through both the multiple-choice question and open-ended question that beg for discussion. In both of the codebook as well as the analysis of the multiple-choice question, it was found that users felt as though they needed to stay home due to the potential of looters and to protect their property. It was also found in the responses of both of these questions that respondents felt they could not leave due to their pets. Both of these responses were found to be more prevalent than financial status or a lack of places to go, which is interesting. It shows that this

target population is more geared toward protecting their property and pets than worrying about the financial hardships of evacuating. This analysis also shows that, although not the most popular reason, that transportation and a lack of place to evacuate to are major concerns for people during a hurricane event. Both of these are key factors that go into deciding to evacuate or stay during a hurricane event.

Other findings that were not as popular as the ones stated above dealt with a variety of reasons as to why the respondents decided not to evacuate. From the multiple choice question these were that the respondent found evacuation dangerous, was a caretaker at the time, had medical problems or that they could not leave their job. The codebook was able to produce more detailed findings due to the open-ended nature of the questions. Respondents were able to use their own words as well as go into more detail as to why they made the decision to not evacuate. A few of these reasons align with the multiple-choice answers such as they could not leave work or had medical issues. Some major outliers found through analyzing the open-ended question through the use of a codebook were the impacts of their social circle, their distrust in the forecast as well as their fear of not being able to return to their county if they left. Although these findings are not as significant as the ones listed above, it is still important to analyze and discuss them. A major factor of moving forward in evacuation behavior research is cultivating a more understanding environment to allow for further insight into these vulnerable populations, which include analyzing the reasons people do not evacuate. This information and insight is crucial to the research of evacuation behavior and should be researched more in depth in future research

4.5 Warning Source Influence and OLS Analysis

As stated above, in the survey, this study listed and identified actors which are the source of hurricane warnings. We compared and contrasted these results to find any type of pattern within the data we collected between two groups: Evacuated Users and Non-Evacuated Users. The rankings as shown in the results section illustrate the likelihood that either group would be influenced by the actors listed in the figures. In both the evacuated and non-evacuated groups, it was found that local emergency managers, state emergency managers as well as federal emergency managers were ranked highest in influence for both groups. This shows that the most influential actors that disseminate hurricane warning information are emergency managers within all three tiers of government. This is also reflected in the OLS analysis, where local, state and federal emergency managers had statistical significance in both evacuation and non-evacuation behaviors dependent on different factors. In contrast, it was found that in both groups, coworkers were the least influential on evacuation behavior. This is also reflected in the OLS analysis where within social actors, coworkers had the most statistical significance compared to the other social actors dependent on different factors. Users who evacuated were more likely to rely on local weather reporters, state elected officials, local media and local elected officials. In the OLS analysis, users who were more positively influenced by local weather reporters reported hurricane concern and education as significant factors on their evacuation behavior. Users that were more positively influenced by state elected officials reported hurricane concern and past hurricane damage as significant factors. The OLS analysis also showed that users who were positively influenced by local media reported hurricane concern as a significant factor. It was also found through the OLS analysis that users who were positively influenced by local elected officials reported hurricane concern and past hurricane damage as significant factors as well. These results

align with much of the previous research done within evacuation behavior studies. Lindell, Lu and Pratter (2005) found that local media was relied on most during Hurricane Lili (2002) as well as Baker (1995) found that local officials had the most influence on evacuation. Through the warning source ranking, it was found that users who reported not evacuating are more likely to listen to their social circle, family and friends specifically, more than users who reported evacuation. In the OLS analysis, it was found that users who reported that they were more negatively influenced, or less likely to evacuate if told by a friend reported that they have not evacuated, used cell phones only, used cell and local television only, used web sources only and age as significant factors in evacuation behavior. The OLS analysis also shows users that reported that they are less likely to evacuate if told by a member of their family, reported that they have not evacuated, used cell phones only, used cell phone and local television only, used web sources only and age as significant factors on their evacuation behavior. These results show a disparity compared to past research such as Adeola (2008) who studied Hurricane Katrina (2005) and found that the persuasion of family and close friends positively correlated to evacuation behavior, where this study shows that specifically, family, friends as well as coworkers are more likely to influence users not to evacuate. This is most likely due to the time disparity between Adeola (2008) and this current study and potentially the social network systems and community structure of the area that Hurricane Katrina (2005) hit, which could allude to a social network system analysis study of evacuation behavior influence in the future.

Chapter 5. Conclusion

This study was able to analyze and produce insightful information about response behavior and the factors that affect it within the southeastern U.S and Gulf coast populations, whom are most vulnerable to hurricane events and the dangers of the Hurricanes have the ability to produce storm surges, massive flooding, dangerously high winds as well as the potential for tornadoes. It is imperative for the science communication community to better understand these vulnerable populations so that they may better the hurricane warning communication system. This system, as stated prior includes the NHC and local weather offices, local emergency managers as well as local media dissemination sources whom all have the goal of serving the community and disseminating information that will give the affected population the tools they need to be safe in an unsafe atmospheric event. This study also looked into the warning to action process briefly, however emphasized on analyzing warnings and how factors that affect the decision-making process that leads to response behavior during a hurricane. The factors that were analyzed were hurricane concern, previous experience, demographic information of the sample population, however mainly focused on sources of weather information.

5.1 Methods of Study

Using a public opinion survey through an online survey tool, Qualtrics, a stratified sample population of over 1500 participants was created and distributed in 2018. Within this population, 44% of the population state they have experienced past hurricane damage, 58% were male as well as the average age was 48 with an age range of 18-90. Also, 72% of the population were white, the average education was between some college to receiving a 2 year

associates degree with an average income between \$60,000 to \$99,999, as stated earlier.

These descriptive statistics illustrate what would be identified as an approximated snapshot of the coastal communities within the southeastern U.S and gulf coast. There is naturally a bias as the nature of the survey was online, therefore leaving out specific groups who do not have access to devices that connect to the internet.

For the analysis portion of this study, there were many factors and analysis techniques used.

For the main dependent variable, which was self-reported evacuation behavior, a multinomial logit regression model was used to obtain results that show the likelihood that the respondent would choose shelter in home, evacuate, or go to shelter compared to “do nothing”. Also, a simple descriptive statistics analysis was done to find the most reported action taken during a hurricane which includes the aforementioned actions with the addition of “do nothing”.

Then to determine types and categories of the respondents, a Latent Class Analysis was used to find structure within the data and create the four groups of respondents which were cell phone only users, cell phone and local television users, users of all listed communication mediums and web only users. Using this type of analysis, I was able to identify the group which would be most likely to evacuate. To determine reasons for not evacuating the multiple-choice question was analyzed using simple statistics, while the open-ended question that asked respondents who reported not evacuating for their reasoning behind the choice was analyzed using coding to create a codebook (Appendix A). Finally, an OLS analysis was performed in which source actors were divided up into four categories: local actors, state actors, federal actors and social actors, then analyzed with the independent variables to determine which actors within these four groups were most influential on the likelihood that a respondent would either evacuate or not evacuate. By performing multiple analyses, this

creates a robust analysis that produces multiple results that can be triangulated to generate more concrete results.

5.2 Findings of Study

This study has analyzed major factors that influence response behavior including hurricane concern, past experience, demographics of the population as well as specifically focusing on sources of hurricane warning information. Using a variety of statistical analysis techniques, this study has created robust findings by triangulating data through these techniques. It is concluded that the main reasons people don't evacuate is due to their hurricane concern as well as feeling that they have a well-built home. Other significant reasons for not evacuating were the fear of crowded roads, or heavy traffic, as well as the perception and strength of the storm. It was found that both users who evacuated as well as did not evacuate were influenced in their decision by local, state and federal emergency managers, which signifies these three sources as the most influential when it comes to evacuation behavior. It was also found that users who get their warning information from their social circle such as family and friends, are less likely to evacuate, while both evacuated and non-evacuated users found their coworkers to be the least popular source of their weather information. Through the multinomial logit analysis, the study opposed previous studies done in that finding that users who reported using cell phone and local television were more likely to do nothing compared to sheltering in home. It was also found that hurricane concern was the most influential factor of evacuation behavior, which aligns with previous studies.

The most popular action taken during a hurricane was found to be sheltering in home followed by evacuating. Over 200 of the participants of the study reported that they would

rather do nothing during a hurricane than go to a community shelter, which begs the question of the safety and environment of the current community shelters. Finally, the major finding of this study was that although there are more influential sources of weather information, such as emergency managers, compared to others, the most important conclusion was that the more engaged a user, meaning that they used a multitude of sources, was more likely to evacuate compared to the other groups in the LCA.

Therefore, this study has both created more robust research of hurricane response behavior by contributing to the field as well as created new findings. A major take-away from this study is that emergency managers are the most influential sources of information during a hurricane event on response behavior. This conclusion is monumental in identifying these sources at every level of government, which could lead to contributing better communication between emergency managers and their affected populations during an evacuation order.

Also, finding that the more engaged a participant of the study was adds a new element to the evacuation behavior research field. Instead of finding one major source that influences populations to evacuate more than others, it is the combination of all sources that leads to the highest likelihood of evacuation. These findings could greatly benefit not only the behavioral science field within the weather enterprise, but also benefits local, state and federal emergency managers in concluding that they have the most influence on hurricane response behavior, which could lead to saving future lives from the disasters of hurricane events.

5.3 Future Research

There is still much to be done in terms of analyzing hurricane response behavior, looking specifically at the population analyzed in this study. Performing a social network analysis on

these vulnerable coastal populations, especially focusing on lower socioeconomic populations and how it impacts their hurricane response behavior would give insight into more social sources of weather information. This would include looking not only at a participant's immediate social circle such as friends, family and coworkers, but also web-based social network communities. Another potential for future research would be to analyze weather information sources on a more local scale and identify potential differences of weather source influence based on geographical information. This would result in valuable information for local emergency managers, who are a popular source for hurricane warning information as well as play an integral role in keeping their community safe during emergency situations. The main goal of this current study as well as the potential for future studies is to better understand how to more effectively communicate emergency information, specifically during dangerous weather events such as hurricanes, to not only preserve the community but to save future lives in the event of a natural disaster.

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Appendix A

Thesis Codebook: Reasons Not to Evacuate
Total Responses: 835

Code	Definition	Example	Count
Stayed Home	Respondent felt safe/prepared at home	“Trusted Home	97
Locality	Respondent was not located in the affected area of evacuation/ near the coast	“Not within affected area”	67
Property Protection	Respondent wanted to protect property	“Protect from looters”	11
Pets	Respondent had pets at home	“Pets”	33
Time	Respondent did not feel they had enough time to evacuate	“Didn’t have enough time”	16
Traffic	Respondent did not want to deal with traffic	“Traffic”	15
Travel	Respondent did not want to travel	“too much travel”	5
Transportation	Respondent did not have transportation	“No transportation”	15
Nowhere to go	Respondent did not have anywhere to go	“No place to go”	36
Perception of Storm	Respondent did not think the storm was that bad	“Didn’t think it was that serious”	102
Financial	Respondent did not have the financial means to evacuate	“Not enough money”	34
Independence	Respondent knew about the storm, but just did not choose to evacuate	“My choice”	27

Previous Experience	Respondent chose not to evacuate based on previous hurricane experience.	“Previous experience with hurricanes”	41
Risk Perception	Respondent did not feel they were at risk of impending hurricane event	“Not afraid of what nature brings”	144
Hurricane Strength	Respondents did not evacuate based on strength of hurricane	“will stay home for cat 2 or less, evacuate for anything stronger”	102
Work	Respondent could not evacuate because they had to work	“Work”	21
Religion	Respondent did not evacuate due to religious beliefs	“Knew God was in control”	4
Shelter	Respondents did not want to go to a shelter	“did not want to go to shelter”	7
Social Circle	Respondents made decision not to evacuate based on other people	“Discussion with neighbors/friends”	36
Forecast	Respondents did not trust forecast	“Did not trust forecast”	23
Perception of Government	Respondents did not trust officials making evacuation order	“Evacuation order was the result of a coward governor”	1
Age	Respondents did not evacuate due to age at the time of storm.	“I was 9”	10
Ignorance	Respondents either did not know the storm was coming identified themselves as being ignorant during the evacuation.	“Stubborn” “Did not know storm was coming”	5

Medical	Respondent did not leave due to medical reasons.	“Just had surgery”	4
Return	Respondents believed that they would not be able to return or have a hard time returning to their home.	“hard to return”	11

Appendix B

Survey Questions

OCFF - Coastal Counties

Start of Block: Welcome

Q2 Welcome

You are invited to participate in this research survey because you are an adult, 18 years of age or older, and are living in a coastal county in the United States. The purpose of this research is to better understand how residents in the United States view important environmental issues facing the country and their local area. This survey should take about 15 minutes to complete. ***Participation is entirely voluntary, and you may withdraw at any time.*** Completion of the survey constitutes your consent to participate in this research. All data obtained will be anonymous. We ask that you do not provide any information that could identify you personally. If you have any questions concerning this research study, please contact Dr. Matthew Nowlin, assistant professor in the Department of Political Science at the College of Charleston at nowlinmc@cofc.edu or (843) 953-0279. This research study has been reviewed by the Human Research Protection Program at the College of Charleston and covers all relevant requirements of the EU General Data Protection Regulations. For information about the review process, please contact the Office of Research and Grants Administration, compliance@cofc.edu or 843-953-5885.

If you wish to participate, please proceed to the questionnaire by clicking "I agree" and the forward arrow button. If not, click "I do not agree." If you would like to leave the survey at any time, just click "Exit this survey."

- I agree (1)
- I do not agree (2)

Skip To: End of Block If Welcome You are invited to participate in this research survey because you are an adult, 18 yea... = I do not agree

End of Block: Welcome

Start of Block: Demographics for Quotas



Q3 How old are you?

Skip To: End of Block If How old are you? < 18

Q4 Are you male or female?

Male (1)

Female (2)

Q5 Which of the following best describes your race or ethnic background?

American Indian (1)

Asian (2)

Black (3)

Hispanic (4)

White (5)

Something Else (6)

Page Break

Q6 Please select the state of your primary residence.

- Alabama (1)
 - Florida (2)
 - Georgia (3)
 - Louisiana (4)
 - Mississippi (5)
 - North Carolina (6)
 - South Carolina (7)
 - Texas (8)
 - Other (please specify) (9)
-

Skip To: End of Block If Please select the state of your primary residence. = Other (please specify)

Display This Question:

If Please select the state of your primary residence. = Alabama

Q7 In which county is your primary residence?

- Baldwin (1)
 - Mobile (2)
 - Other (please specify) (3)
-

Skip To: End of Block If In which county is your primary residence? = Other (please specify)

Display This Question:

If Please select the state of your primary residence. = Florida

Q8 In which county is your primary residence?

- Bay (1)
- Brevard (2)
- Broward (3)
- Charlotte (4)
- Citrus (5)
- Clay (6)
- Collier (7)
- Dixie (8)
- Duval (9)
- Escambia (10)
- Flagler (11)
- Franklin (12)
- Gulf (13)
- Hernando (14)
- Hillsborough (15)
- Indian River (16)
- Jefferson (17)
- Lake (18)
- Lee (19)
- Leon (20)

- Levy (21)
- Liberty (22)
- Manatee (23)
- Martin (24)
- Miami-Dade (25)
- Monroe (26)
- Nassau (27)
- Okaloosa (28)
- Orange (29)
- Palm Beach (30)
- Pasco (31)
- Pinellas (32)
- Polk (33)
- Putnam (34)
- St. Johns (35)
- St. Lucie (36)
- Santa Rosa (37)
- Sarasota (38)
- Seminole (39)
- Taylor (40)
- Volusia (41)

- Wakulla (42)
- Walton (43)
- Other (please specify) (44)
-

Skip To: End of Block If In which county is your primary residence? = Other (please specify)

Display This Question:

If Please select the state of your primary residence. = Georgia

Q9 In which county is your primary residence?

- Brantley (1)
- Bryan (2)
- Camden (3)
- Charlton (4)
- Chatham (5)
- Glynn (6)
- Liberty (7)
- McIntosh (8)
- Wayne (9)
- Other (please specify) (10)
-

Skip To: End of Block If In which county is your primary residence? = Other (please specify)

Display This Question:

If Please select the state of your primary residence. = Louisiana

Q10 In which parish is your primary residence?

- Calcasieu (1)
 - Cameron (2)
 - Iberia (3)
 - Jefferson (4)
 - Lafourche (5)
 - Livingston (6)
 - Orleans (7)
 - Plaquemines (8)
 - St. Bernard (9)
 - St. Charles (10)
 - St. James (11)
 - St. John the Baptist (12)
 - St. Martin (13)
 - St. Mary (14)
 - St. Tammany (15)
 - Tangipahoa (16)
 - Terrebonne (17)
 - Vermilion (18)
 - Other (please specify) (19)
-

Skip To: End of Block If In which parish is your primary residence? = Other (please specify)

Display This Question:

If Please select the state of your primary residence. = Mississippi

Q11 In which county is your primary residence?

- Hancock (1)
 - Harrison (2)
 - Jackson (3)
 - Other (please specify) (4)
-

Skip To: End of Block If In which county is your primary residence? = Other (please specify)

Display This Question:

If Please select the state of your primary residence. = North Carolina

Q12 In which county is your primary residence?

- Beaufort (1)
- Bertie (2)
- Brunswick (3)
- Camden (4)
- Carteret (5)
- Chowan (6)
- Craven (7)
- Currituck (8)
- Dare (9)
- Gates (10)
- Hertford (11)
- Hyde (12)
- New Hanover (13)
- Onslow (14)
- Pamlico (15)
- Pasquotank (16)
- Pender (17)
- Perquimans (18)
- Tyrrell (19)
- Washington (20)

Other (please specify) (21)

Skip To: End of Block If In which county is your primary residence? = Other (please specify)

Display This Question:

If Please select the state of your primary residence. = South Carolina

Q13 In which county is your primary residence?

- Beaufort (1)
 - Berkeley (2)
 - Charleston (3)
 - Colleton (4)
 - Dorchester (5)
 - Georgetown (6)
 - Horry (7)
 - Jasper (8)
 - Other (please specify) (9)
-

Skip To: End of Block If In which county is your primary residence? = Other (please specify)

Display This Question:

If Please select the state of your primary residence. = Texas

Q14 In which county is your primary residence?

- Aransas (1)
 - Brazoria (2)
 - Calhoun (3)
 - Cameron (4)
 - Chambers (5)
 - Galveston (6)
 - Harris (7)
 - Jackson (8)
 - Jefferson (9)
 - Kenedy (10)
 - Kleberg (11)
 - Matagorda (12)
 - Nueces (13)
 - Orange (14)
 - Refugio (15)
 - San Patricio (16)
 - Victoria (17)
 - Willacy (18)
 - Other (please specify) (19)
-

Skip To: End of Block If In which county is your primary residence? = Other (please specify)

End of Block: Demographics for Quotas

Start of Block: Coastal Issues 1



Q15 Listed below are several issues that may impact the natural environment and human health. On a scale from 0 to 10, with **0 being not at all concerned** and **10 being extremely concerned**, how concerned are you about...

	Not at all concerned 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 (6)	6 (7)	7 (8)	8 (9)	9 (10)	Extremely Concerned 10 (11)
The availability of fresh and locally harvested seafood (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The impacts of development on the land and water quality of coastal areas (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The contamination of coastal waters (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of biodiversity (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sea-level rise (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flooding in your local area (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increases in population in your local area (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Coastal Issues 1

Start of Block: Coastal Issues 2



Q16 Listed below are several issues that may impact the natural environment and human health. On a scale from 0 to 10, with **0** being *not at all concerned* and **10** being *extremely concerned*, how concerned are you about...

	Not at all concerned 0 (1)	1 (2)	2 (3)	3 (4)	4 (5)	5 (6)	6 (7)	7 (8)	8 (9)	9 (10)	Extremely Concerned 10 (11)
Drought in your local area (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Changes in the chemical balance of the oceans (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An increase in infections resistant to antibiotics (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An increase in the intensity of hurricanes (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The availability and costs of energy (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The quality of natural waterways such as streams, lakes, and rivers in your local area (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Coastal Issues 2

Start of Block: Policy Measures 2



Q18 Listed below are several actions that private businesses and/or state and local governments can take to resolve some community concerns. On a scale from 1 to 7, with **1**

being strongly oppose and *7 being strongly support*, please indicate your view on the following actions.

	Strongly Oppose 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Support 7 (7)
Drilling for oil and natural gas offshore (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Placing wind turbines for wind energy offshore (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beach restoration projects that move sand from the ocean or other areas to replace sand loss (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Habitat restoration projects to protect biodiversity along the coast (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Catch limits to ensure the presence of future fish populations for commercial harvest (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Require vulnerable, highly populated residential and commercial areas to retreat inland and away from the coast (6)

Change government regulations and zoning laws in coastal areas to restrict development (7)

Public investment in infrastructure projects to improve drainage following a flood (8)

Building sea walls or other barriers to protect coastal areas from sea-level rise and flooding (9)

End of Block: Policy Measures 2

Start of Block: Insurance

Q63 Do you own your home or are you renting?

- Own home (1)
- Rent (2)
- Other (please specify) (3)
-

Display This Question:

If Do you own your home or are you renting? = Own home

Q64 Do you have homeowners insurance?

- No (1)
- Yes (2)
- Not sure (3)
-

Display This Question:

If Do you have homeowners insurance? = Yes

Q65 Does your homeowners insurance cover damage from flooding?

- No (1)
- Yes (2)
- Not sure (3)
-

Display This Question:

If Do you own your home or are you renting? = Rent

Q65 Do you have renters insurance?

- No (1)
- Yes (2)
- Not sure (3)
-

Q66 Do you currently have flood insurance?

- No (1)
- Yes (2)
- Not sure (3)
-

Display This Question:

If Do you currently have flood insurance? = Yes

Q24 Is your flood insurance policy provided by the National Flood Insurance Program (NFIP)?

- No (1)
- Yes (2)
- Not sure (3)
-

Q25

As you may know, the Federal Emergency Management Agency (FEMA) is responsible for developing and maintaining a map of areas that are susceptible to flooding in the U.S. These areas are called Special Flood Hazard Areas or flood zones, or floodplains for short.

To the best of your knowledge, is your home located in FEMA flood zone?

- No (1)
- Yes (2)
- Don't know (3)

End of Block: Insurance

Start of Block: News



Q105 Which of the following sources do you use to get information about the WEATHER?
Please check all that apply.

- Newspapers (1)
- Non-government Internet websites (such as weather.com) (2)
- Government sponsored Internet websites (such as noaa.gov) (3)
- Local TV (television) news (4)
- Cable TV (television) news (such as The Weather Channel) (5)
- Radio (6)
- Family, friends or colleagues (7)
- Social Media, such as Facebook and Twitter (8)
- Cell phone applications or automated text messages (9)
- Other (please specify) (10)
-

Page Break



Q106 Which of the following sources do you TRUST the most to provide accurate information about the WEATHER? Please check only one.

- Newspapers (1)
 - Non-government Internet websites (such as weather.com) (2)
 - Government sponsored Internet websites (such as noaa.gov) (3)
 - Local TV (television) news (4)
 - Cable TV (television) news (such as The Weather Channel) (5)
 - Radio (6)
 - Family, friends or colleagues (7)
 - Social Media, such as Facebook and Twitter (8)
 - Cell phone applications or automated text messages (9)
 - Other (please specify) (10)
-

End of Block: News

Start of Block: Hurricane a

Q101

The National Hurricane Center has indicated that a **Category 2 hurricane**, with winds of 96-110 miles per hour, is likely to impact your local area.

Which of the following most accurately describes what you would do?

- Nothing (1)
 - Move to the most sheltered part of your residence when the storm approaches, but do not leave your residence (2)
 - Move to an evacuation shelter in your community (3)
 - Leave your residence and drive away from the hurricane warning area, that is *evacuate* (4)
 - Other (please specify) (5)
-

End of Block: Hurricane a

Start of Block: Hurricane b

Q134

The National Hurricane Center has indicated that a **Category 2 hurricane**, with winds of 96-110 miles per hour, is likely to impact your local area.

In addition, the hurricane is expected to produce heavy rain and will likely cause major flooding in your area.

Which of the following most accurately describes what you would do?

- Nothing (1)
 - Move to the most sheltered part of your residence when the storm approaches, but do not leave your residence (2)
 - Move to an evacuation shelter in your community (3)
 - Leave your residence and drive away from the hurricane warning area, that is *evacuate* (4)
 - Other (please specify) (5)
-

End of Block: Hurricane b

Start of Block: Hurricane II



Q140

Below is a list of people that may encourage you to evacuate due to the **hurricane**.

Would you be *more or less likely to evacuate if encouraged by ...*

	Extremel y unlikely (1)	Moderatel y unlikely (2)	Slightl y unlikel y (3)	Neither likely nor unlikel y (4)	Slightl y likely (5)	Moderatel y likely (6)	Extremel y likely (7)
The local weather reporter (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local media (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your friends (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your coworkers (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your family members (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local emergency manageme nt officials (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local elected officials (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
State emergency manageme nt officials (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
State elected officials (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Federal emergency manageme nt officials (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Federal
elected
officials
(11)



National
Media (12)



Page Break

Q141 Has your home ever been damaged by a hurricane? Either wind or water damage.

- No (1)
- Yes (2)

Display This Question:

*If Has your home ever been damaged by a hurricane? Either wind or water damage. =
Yes*

Q142 Approximately how long ago did damage caused by the *most recent* hurricane occur?

- 0 - 5 years ago (1)
- 6 - 10 years ago (2)
- 11 - 15 years ago (3)
- 16 - 20 years ago (4)
- 21 - 25 years ago (5)
- More than 25 years ago (6)

Q143 If you had to guess, what is the probability that your home will be damaged by a hurricane in the next year? Please indicate the probability as a percent between 0 and 100.

End of Block: Hurricane II

Start of Block: Evacuate

Q124 Have you ever left your home for someplace safer to avoid a major natural disaster; that is have you ever evacuated?

- No (1)
- Yes (2)

Display This Question:

If Have you ever left your home for someplace safer to avoid a major natural disaster; that is have... = Yes



Q97 What was the disaster for which you *most recently* evacuated?

- Hurricane (1)
- Flood (2)
- Tornado (3)
- Wildfire (4)
- Other (please specify) (5)
-

Page Break

Q125 Have you ever stayed in your home during a major natural disaster even though your area was advised to leave for someplace safer; that is to evacuate?

No (1)

Yes (2)

Display This Question:

If Have you ever stayed in your home during a major natural disaster even though your area was advis... = Yes

Q126 Why did you decide not to evacuate? (please specify)

Display This Question:

If Have you ever stayed in your home during a major natural disaster even though your area was advis... = Yes

Q127 Do you feel you made the right choice to not evacuate?

No (1)

Yes (2)

Not sure (3)

Page Break



Q128 Below are a list of reasons why some people might have for not evacuating the area where they live if there were a major natural disaster. For each one, *please indicate if it is a reason why you would not/might not evacuate.*

	Yes (1)	No (2)	Don't know (3)
You don't know where to go (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You don't have adequate transportation (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You have medical or physical problems that would make it difficult to leave (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You have to take care of someone who would be physically unable to leave (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You would be worried your possessions would be stolen or damaged if you left (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You would not want to leave your pet (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You would not be able to afford to leave (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You would not be able to leave your job (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You think your home is well-built and you will be safe at home (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You think evacuating would be dangerous (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You think the roads would be too crowded to leave (11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

Q129 In your view, are the hurricanes that have occurred in the last two years evidence of climate change or global warming?

- Definitely not (1)
- Probably not (2)
- Might or might not (3)
- Probably yes (4)
- Definitely yes (5)

End of Block: Evacuate

Start of Block: Severe Weather: Experience



Q17 In the last few years, have you experienced any of the following kinds of events in the area around where you live? Please indicate all that apply.

- Extreme high winds (1)
- Drought (2)
- Extreme rainstorms (3)
- Floods (4)
- Tornadoes (5)
- Wildfires (6)
- Earthquakes (7)
- Extreme cold temperatures (8)
- Extreme hot temperatures (9)
- Extreme snowstorms (10)
- Extreme ice storms (11)
- Hail storms (12)
- Hurricane (13)

End of Block: Severe Weather: Experience

Start of Block: Severe Weather: Preparedness

Q69 The next set of questions asks about you and your communities preparedness for future severe weather events

Q30 How prepared do you feel your *household* is to cope with future severe weather events?

- Not at all prepared (1)
 - Somewhat unprepared (2)
 - Unsure (3)
 - Well prepared (4)
 - Very well prepared (5)
-

Q68 How prepared do you feel your *community* is to cope with future servere weather events?

- Not at all prepared (1)
 - Somewhat unprepared (2)
 - Unsure (3)
 - Well prepared (4)
 - Very well prepared (5)
-

Page Break



Q31 Do you have any of the following available at your residence to protect you and others in your household from severe weather events? Please indicate all that apply

- An emergency response plan for you and your family (1)
 - A backup source of information about extreme weather, like a weather radio (2)
 - An emergency preparedness kit containing such things as first-aid supplies, flashlights, batteries, etc. (3)
 - Supplies of water and food specially packaged or designated for use in emergencies (4)
 - A generator (either mobile or fixed) to provide electricity in emergencies (5)
 - Other (please specify) (6)
-

Page Break

Q83 If it occurs, how likely is it that a severe weather event could have a lasting negative effect on your *household*?

- Extremely unlikely (1)
 - Moderately unlikely (2)
 - Slightly unlikely (3)
 - Neither likely nor unlikely (4)
 - Slightly likely (5)
 - Moderately likely (6)
 - Extremely likely (7)
-

Q84 If it occurs, how likely is it that a severe weather event could have a lasting negative effect on your *community*?

- Extremely unlikely (1)
- Moderately unlikely (2)
- Slightly unlikely (3)
- Neither likely nor unlikely (4)
- Slightly likely (5)
- Moderately likely (6)
- Extremely likely (7)

End of Block: Severe Weather: Preparedness

Start of Block: Resilient Responsibility

Q32 Being resilient and prepared for severe weather events requires having homes that are resistant to high winds and water; access to a sheltered location; and access to an effective warning system. Different types of people and organizations all have a part in assuring that households are prepared for a severe weather event: homeowners, residents of the local neighborhood, local officials, state officials, and federal officials.



Q34 In your view, who should be responsible for assuring that households are resilient and prepared for **hurricanes**? Assign responsibility across the following people and groups. The total should add up to 100%.

Household residents (homeowners or renters) : _____ (1)

Residents in the local area (neighbors) : _____ (2)

Local officials (emergency managers, mayors, etc.) : _____ (3)

State officials (state legislators, governors, etc.) : _____ (4)

Federal officials (members of congress, the president, etc.) : _____ (5)

Total : _____

End of Block: Resilient Responsibility

Start of Block: Community Resilience I



Q29 Using a scale from one to seven, where one means you strongly disagree and seven means you strongly agree, please respond to the following statements about your community including your neighborhood or immediate surrounding area

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree 7 (7)
People in this community feel like they belong to the community (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in this community are committed to the well-being of the community (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in this community have hope about the future (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in this community help each other (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This community treats people fairly no matter what their background is (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Community Resilience I

Start of Block: Community Resilience II



Q93 Using a scale from one to seven, where one means you strongly disagree and seven means you strongly agree, please respond to the following statements about your community including your neighborhood or immediate surrounding area

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree 7 (7)
This community has the resources it needs to take care of community problems (resources include money, information, technology, tools, raw materials, and services) (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This community has effective leaders (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in this community are able to get the services they need (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in this community know where to go to get things done (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Community Resilience II

Start of Block: Community Resilience III



Q94 Using a scale from one to seven, where one means you strongly disagree and seven means you strongly agree, please respond to the following statements about your community including your neighborhood or immediate surrounding area

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree 7 (7)
This community works with organizations and agencies outside the community to get things done (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in this community communicate with leaders who can help improve the community (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in this community work together to improve the community (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This community looks at its successes and failures so it can learn from the past (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

This community develops skills and finds resources to solve its problems and reach its goals (5)

This community has priorities and sets goals for the future (6)

This community has mechanisms for routinely providing accurate information to residents about local issues (7)

This community holds meetings so residents can voice their views and needs (8)

This community has a person(s) who is trusted to deliver accurate information to its residents in time of need or crisis. (9)

People in this community trust the local news media to deliver accurate information (10)

This community has a mechanism for providing accurate information to residents during emergencies (11)

People in this community support programs for children and families (12)

People in
this
community
trust public
officials (13)



End of Block: Community Resilience III

Start of Block: Community Resilience IV



Q95 Using a scale from one to seven, where one means you strongly disagree and seven means you strongly agree, please respond to the following statements about your community including your neighborhood or immediate surrounding area

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree 7 (7)
This community tries to prevent disasters (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This community actively prepares for future disasters (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This community can provide emergency services during a disaster (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This community has services and programs to help people after a disaster (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Community Resilience IV

Start of Block: Climate Change View/Perception 1

Q36 Recently, you may have noticed that climate change has been getting more attention in the news. Climate change refers to the significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, rainfall, or wind patterns, among other effects that occur over several decades or longer.

The next several questions ask about *your* views on climate change and environmental issues. These questions concern your perceptions and beliefs, so don't worry about being right or wrong when providing your answers.

Q37 Do you think that climate change is happening?

- Yes (1)
 - No (2)
 - Don't know (3)
-

Display This Question:

If Do you think that climate change is happening? = Yes

Q38 How sure are you that climate change is happening?

- Not at all sure (1)
 - Somewhat sure (2)
 - Very sure (3)
 - Extremely sure (4)
-

Display This Question:

If Do you think that climate change is happening? = No

Q39 How sure are you that climate change is *not* happening?

- Not at all sure (1)
 - Somewhat sure (2)
 - Very sure (3)
 - Extremely sure (4)
-

Q40 Assuming climate change is happening, do you think it is...

- Caused mostly by human activities (1)
 - Caused mostly by changes in the natural environment (2)
 - None of the above, because climate change isn't happening (3)
-

Q41 Which of the following statements comes closest to your view?

- Most scientists think climate change is happening. (1)
 - Most scientists think climate change is not happening. (2)
 - There is a lot of disagreement among scientists about whether or not climate change is happening. (3)
 - Don't know enough to say. (4)
-

Q42

In your view, what percentage of scientists, from 0 to 100 percent, think climate change is happening? Please specify.

Q107 Have you personally experienced the effects of climate change?

- No (1)
 - Yes (2)
 - Don't know (3)
-

Q42 On the scale from zero to ten, where **0 means no risk** and **10 means extreme risk**, how much risk do you think climate change poses for people and the environment?

	No	1	2	3	4	Moderate Risk	6	7	8	9	Extreme Risk
	Risk 0 (1)	(2)	(3)	(4)	(5)	5 (6)	(7)	(8)	(9)	(10)	10 (11)
Climate Change Risk (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Climate Change View/Perception 1

Start of Block: Social Capital: Bonding

Q43 This next set of questions asks you about your social relationships.

Q44 How do you rate the number of your friends? Would you say that you have a few, less than average, average, more than average, or a lot of friends?

- A few (1)
 - Less than average (2)
 - Average (3)
 - More than average (4)
 - A lot (5)
-

Q46 How do you rate the number of your old classmates with which you are still in contact? Would you say that you keep in touch with a few, less than average, average, more than average, or a lot?

- A few (1)
 - Less than average (2)
 - Average (3)
 - More than average (4)
 - A lot (5)
-

Q45 Among your coworkers, how many you can trust?

- None (1)
- A few (2)
- Some (3)
- Most (4)
- All (5)

Q48 Among your relatives, how many you can trust?

- None (1)
 - A few (2)
 - Some (3)
 - Most (4)
 - All (5)
-

Q49 Among all your relatives, neighbors, friends, co-workers, and classmates, how many have broad connections with others?

- None (1)
 - A few (2)
 - Some (3)
 - Most (4)
 - All (5)
-

Q50 Among all your family members, relatives, neighbors, friends, co-workers, and old classmates, how many hold a professional job?

- None (1)
 - A few (2)
 - Some (3)
 - Most (4)
 - All (5)
-

Q51 How many of your coworkers will definitely help you upon your request?

- None (1)
 - A few (2)
 - Some (3)
 - Most (4)
 - All (5)
-

Q52 How many of your friends will definitely help you upon your request?

- None (1)
- A few (2)
- Some (3)
- Most (4)
- All (5)

End of Block: Social Capital: Bonding

Start of Block: Social Capital: Bridging

Q53 This next set of questions asks you about groups and organizations within your community.

Q54 How do you rate the number of cultural, religious, recreational and leisure groups/organizations in your community? Would you say that there are a few, less than average, average, more than average, or a lot of such groups/organizations?

- A few (1)
 - Less than average (2)
 - Average (3)
 - More than average (4)
 - A lot (5)
-

Q55 How do you rate the number of governmental, political, economic and social groups/organizations in your community? Would you say that there are a few, less than average, average, more than average, or a lot of such groups/organizations?

- A few (1)
 - Less than average (2)
 - Average (3)
 - More than average (4)
 - A lot (5)
-

Q56 How many of these groups and organizations in your community possess broad social connections?

- None (1)
 - A few (2)
 - Some (3)
 - Most (4)
 - All (5)
-

Q57 How many of these groups and organizations in your community possess great social influence?

- None (1)
 - A few (2)
 - Some (3)
 - Most (4)
 - All (5)
-

Q58 How many of the cultural, religious, recreational and leisure groups/organizations represent your interests?

- None (1)
- A few (2)
- Some (3)
- Most (4)
- All (5)

Q61 How many of the governmental, political, economic and social groups/organizations represent your interests?

- None (1)
- A few (2)
- Some (3)
- Most (4)
- All (5)
-

Q60 How many of the cultural, religious, recreational and leisure groups/organizations will help you upon your request?

- None (1)
- A few (2)
- Some (3)
- Most (4)
- All (5)
-

Q62 How many of the governmental, political, economic and social groups/organizations will help you upon your request?

- None (1)
- A few (2)
- Some (3)
- Most (4)
- All (5)

End of Block: Social Capital: Bridging

Start of Block: Cultural Theory



Q43 Now, please respond to each of the following statements using a scale from 1 to 7, where **1 means strongly disagree** and **7 means strongly agree**.

	Strongly Disagree 1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	Strongly Agree 7 (7)
What society needs is a fairness revolution to make the distribution of goods more equal. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Even if some people are at a disadvantage, it is best for society to let people succeed or fail on their own. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The best way to get ahead in life is to work hard and do what you are told to do. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The most important things that take place in life happen by chance. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Society works best if power is shared equally. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Even the disadvantaged should have to make their own way in the world. (6)

Society is in trouble because people do not obey those in authority. (7)

No matter how hard we try, the course of our lives is largely determined by forces beyond our control. (8)

It is our responsibility to reduce differences in income between the rich and the poor. (9)

We are all better off when we compete as individuals. (10)

Society would be much better off if we imposed strict and swift punishment on those who break the rules. (11)

For the most part, succeeding in life is a matter of chance. (12)

End of Block: Cultural Theory

Start of Block: Demographics 1

Q74 The survey is almost complete. Please answer the following questions to tell us about yourself.

Q77 What is the highest level of education that you have **completed**?

- Less than high school (1)
- High school graduate / GED (2)
- Vocational or technical training (3)
- Some college (4)
- 2 year / Associate's degree (5)
- 4 year / Bachelor's degree (6)
- Graduate or professional degree (7)

Q79 How long have you lived in your current primary residence?

- Less than 2 years (1)
 - 2 to 5 years (2)
 - 5 to 10 years (3)
 - 10 to 20 years (4)
 - More than 20 years (5)
-



Q80 What is the five digit zip code of your primary residence?

Q103 Which one of the following BEST describes your current employment status?

- Not working and not seeking a job outside the home (1)
- Not working outside the home, but seeking work (2)
- Working part-time outside the home (3)
- Working full-time outside the home (4)
- Working full-time inside the home (5)
- Working part-time inside the home (6)
- Student (7)
- Retired (8)
- Disabled (9)

Display This Question:

*If Which one of the following BEST describes your current employment status? =
Working full-time outside the home*

*Or Which one of the following BEST describes your current employment status? =
Working part-time outside the home*

Q104 Are you currently employed in any of the following sectors? Check all that apply.

- Living Resources, such as fishing, aquaculture, fish and seafood markets (1)
 - Marine Construction and/or Engineering (2)
 - Marine Transportation, such as passenger transportation, freight transportation, port and harbor operations (3)
 - Offshore Mineral Resources, such as sand and gravel mining, natural gas extraction, oil and gas drilling (4)
 - Ship and Boat building (5)
 - Tourism and Recreation, such as restaurants, bars, hotel, marinas, water tours, and recreation services (6)
 - Other (please specify) (7)
-

End of Block: Demographics 1

Start of Block: Demographics 2

Q81 What is your present religion, if any? Are you...

- Protestant (1)
 - Catholic (2)
 - Mormon (3)
 - Orthodox (4)
 - Jewish (5)
 - Muslim (6)
 - Buddhist (7)
 - Hindu (8)
 - Atheist (9)
 - Agnostic (10)
 - Other (please specify) (11)
-

Display This Question:

If What is your present religion, if any? Are you... = Protestant

Or If

What is your present religion, if any? Are you... = Catholic

Or If

What is your present religion, if any? Are you... = Mormon

Or If

What is your present religion, if any? Are you... = Orthodox

Q82 Would you describe yourself as a "born again" or evangelical Christian, or not?

- Yes (4)
 - No (5)
 - Don't Know (6)
-

Q83 Aside from weddings and funerals, how often do you attend religious services?

- Never (1)
 - Seldom (2)
 - A few times a year (3)
 - Once or twice a month (4)
 - Once a week (5)
 - More than once a week (6)
-

Q84 With which political party do you most identify?

- Democratic (1)
 - Republican (2)
 - Independent (3)
 - Other (please specify) (4)
-

Display This Question:

If With which political party do you most identify? = Independent

Or With which political party do you most identify? = Other (please specify)

Q85 As of today do you lean more to the Republican Party or more to the Democratic Party or neither?

- Republican (1)
 - Democratic (2)
 - Neither (3)
-

Display This Question:

If With which political party do you most identify? = Democratic

Or With which political party do you most identify? = Republican

Q86 Do you completely, somewhat, or slightly identify with that party?

- Completely (1)
 - Somewhat (2)
 - Slightly (3)
-

Q87 On a scale of political ideology, individuals can be arranged from strongly liberal to strongly conservative. Which of the following best describes your views? Would you say that you are

- Strongly Liberal (1)
 - Liberal (2)
 - Slightly Liberal (3)
 - Middle of the Road (4)
 - Slightly Conservative (5)
 - Conservative (6)
 - Strongly Conservative (7)
-

Q89 Last year, that is in 2017, what was your total family income from all sources, before taxes?

- 0 to \$19,999 (1)
- 20 to \$39,999 (2)
- 40 to \$59,999 (3)
- 60 to \$79,999 (4)
- 80 to \$99,999 (5)
- 100 to \$149,999 (11)
- \$150,000 or more (12)

End of Block: Demographics 2

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789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346