Capturing Local Knowledge in the Southeastern United States

Whitepaper

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Abstract

The U.S. rural Southeast is particularly vulnerable to the impacts of climate change, disproportionately affecting the poor, people of color, and other marginalized communities because of their socio-economic and historical conditions. Through NOAA's Climate Adaptation Partnerships (CAP), formerly known as the Regional Integrated Sciences and Assessments (RISA) Program, The Southeast Climate and Energy Network (SCEN) and its research partners, reached out to three rural communities in the Southeast (i.e., Peach County, GA, Macon County, AL, and Jefferson County, FL) to document and create collaborative relationships that help these communities build lasting and equitable climate resilience solutions. An additional objective was to incentivize local efforts to prepare these communities for present and future climate impacts. This study identified key stakeholders and opportunities to leverage local assets and recommend the creation of Resilience Hubs as an effective mechanism to educate, prepare, and adapt these communities to the impacts of climate change.

Capturing Local Knowledge in the Southeastern United States

The U.S. rural South is particularly vulnerable to the impacts of climate change, disproportionately affecting poor, Black, Indigenous, People of Color (BIPOC), and other marginalized communities. Many of these communities are facing an increase in extreme weather, flooding, heat-related deaths, energy cost burdens, and a decrease in agricultural output and labor productivity. Exemplified by rural Alabama, Georgia, and North Florida, the Deep South's rural communities have historically been supported by agricultural development and natural resources that are threatened by the impacts of climate change and the lack of planning for climate adaptation.

Through NOAA's Climate Adaptation Partnerships (CAP), formerly known as the Regional Integrated Sciences and Assessments (RISA) Program, The Southeast Climate and Energy Network (SCEN) and its research partners (The Team), reached out to three communities located in rural Alabama, Georgia, and Florida, to create collaborative relationships that help these communities build lasting and equitable climate resilience.

NOAA's Climate Adaptation Partnerships (CAP) Program

Formerly known as the Regional Integrated Sciences and Assessments (RISA) Program, the NOAA's Climate Adaptation Partnership (CAP) program is an engagement program that uses applied research to expand society's regional capacity to adapt to climate change in the U.S. (NOAA, n.d.). According to CAP/RISA, learning about and doing adaptation happens within social contexts and teams of research institutions, state/local/Tribal governments, and nonprofit organizations, such as SCEN, are the best entities able to build the necessary relationships with these communities.

Objectives of the Research

The objectives of this research were to explore existing collaborative relationships and create new ones in the U.S. Southeast that could help these communities build lasting and equitable climate resilience solutions. The objectives included:

1. Identification of three communities (one in Alabama, one in Georgia, and one in Florida) that meet the following criteria: (a) it is a rural community (b) it is ethnically diverse, and (c) it is economically challenged.
2. Identification of potential local partners including local governments, universities, business, and environmental organizations. Pre-visit the sites to engage with the identified community partners and determine a suitable location for the workshop, accommodations for researchers, and plan additional logistics for the workshop.
3. Perform an Anonymous Survey to community members to collect data about their perceptions related to climate change and climate change adaptation.
4. Perform a workshop to guide community members in the development of a Vulnerability, Consequences, and Adaptation Planning Scenarios (VCAPS) process to discover and understand these communities' assets, priorities and needs to address the most pressing issues of climate change.
5. Perform video-interviews of community members to collect stories about how these communities are dealing with the impacts of climate change and what these communities are doing to adapt to these changes.
6. Disseminate the information collected to these communities.
7. Write a Whitepaper with the results (i.e., this paper).

Process of Engagement of Collaborators and Development of Partnerships

The criterion for the selection of the subject communities is described in the Methods Chapter. The process of engagement consisted of contacting via phone and email potential partners from the following groups (1) local-governments; (2) local higher-education institutions; (3) local non-profits (e.g., environmental and religious institutions); and (4) local organizations representing for-profit groups (e.g., chambers of commerce). Those who responded to The Team's request were selected as collaborators and potential partners for future research. These collaborators/potential partners are listed in Appendix A.

The Team also performed a pre-workshop visit to each one of the selected communities and spoke with a variety of potential local partners who could be interested in the workshop. During these visits, The Team explored the best locations to host the workshop.

Subject Communities Selected and Communities' Partners

Based on the criteria above, The Team selected the following communities: Macon County in Alabama; Peach County in Georgia; and Jefferson County in Florida. Local universities expressed interest in participating and hosting the workshops and they were selected as the preferred communities' partners. A summary of the criteria for each one of the communities is shown in Table 1.

Table 1. *Communities Selected*

Community	**Population** (Estimates July 1, 2021)	**Race/Ethnicity**	**Persons in Poverty (%)**	**Closer Higher-Education Institution**
Macon County AL[(1)]	18,516	Black (79.5%), White (18.1%) & Hispanic or Latino (2.5%)	27.5%	Tuskegee University - HBCU
Peach County, GA[(2)]	28,417	White (51.7%) Black (44.6%) & Hispanic or Latino (8.4%)	19.5%	Fort Valley State University – HBCU
Jefferson County, FL[(3)]	14,555	White (64.9%), Black (32%) & Hispanic or Latino (4.7%)	16.4%	Florida A&M – HBCU Florida State University

Note: References:

(1) https://www.census.gov/quickfacts/fact/table/maconcountyalabama/PST045222

(2) https://www.census.gov/quickfacts/fact/table/peachcountygeorgia/PST045222

(3) https://www.census.gov/quickfacts/fact/table/jeffersoncountyflorida/PST045221

Climate Change Impacts on the Southeast (Inland)

The Southeast of the U.S. is particularly vulnerable to the impacts of climate change. These impacts include the increasingly extreme risks from heat, flooding, vector-borne diseases, wildfires, and sea level rise in coastal areas (USGCRP, 2018). Economic studies suggest that the Southeast and the Midwest are likely to suffer the largest losses from projected climate changes in the United States (Hisiang et al., 2017).

The topography of the region under this research is mostly inland low-lying areas, which is vulnerable to floods. Some impacts are already being felt, like extreme downpours, but other impacts such as exposure to dangerous high temperatures and new diseases are expected to become more significant in the coming decades (USGCRP, 2018).

Increase of temperature

The Southeast experienced high temperatures in the 1920s and 1930s and a decline in temperature in the 1970s; however, the annual average temperature has been increasing since then (USGCRP, 2018). In fact, the decade of 2010 was the warmest for average daily maximum and average daily minimum temperature (p. 749), and the number of nights with temperatures greater than 75°F was larger than any other decade in the century (p. 750). Studies have shown that hot night indexes are strongly associated with caused-specific deaths (Royé et al., 2021). The length of the freeze-free season in the region has been nearly 1.5 weeks greater than any other period in the historical record (USGCRP, 2018, p.750). Pests and pathogens that affect forests and crops are projected to benefit from warmer temperatures and longer frost-free seasons, which can potentially affect growing seasons for vegetation (USGCRP, n.d).

Increase of precipitation and intensification of hurricanes

More than 70% of the stations in the region have recorded an increase of extreme rainfall events since the 1950s, although there are some downward trends in Florida (USGCRP, 2018, p.751). Since 2014, there have been numerous examples of intense rainfall events across the region, many approaching levels that would be expected to occur only once every 500 years. Of these events, four major inland flood events have occurred in just three years (2014–2016) causing billions of dollars in damages and loss of life (p.763).

In 2018, Hurricane Michael made landfall along the Florida panhandle near Panama City as a Category 5 hurricane. Michael was the strongest hurricane on record to make landfall along the Florida panhandle as well as the first major hurricane (Category 3+) to directly impact Georgia since the 1890s (Weather.gov, n.d.). In southwest Georgia, wind gusts were as high as 115 mph causing widespread tree damage, power outages, severe crop damage, and 16 deaths. Michael totaled about $25 billion in damage in the United States (NOAA, 2019).

Climate Change Projections in the Southeast Inland

Increase of temperature and precipitation

Climate model simulations project increases in temperature and extreme precipitation for both lower and higher scenarios (i.e., RCP4.5 and RCP8.5) (USGCRP, 2018, p. 752). Under the higher scenario, the normal minimum temperature at night would be above 75°F and the normal maximum temperatures during the day would be above 95°F; during the summer, the normal temperature at night would be above 80°F and the normal temperature during the day would be above 100°F. These high

temperatures, now relatively rare to occur, will become commonplace (p. 752). Exposure to high temperatures at night reduces the ability of some people to recover from high daytime temperatures, resulting in heat-related illness and death (p. 753). The freeze-free season would extend by more than a month, and the frequency of freezing temperatures would decrease substantially.

Increase of precipitation and extreme weather events will likely impact infrastructure including roads, bridges, and freight rail, creating cascade effects in the region (p. 756). Water and wastewater treatment plants can also be compromised. The growing number of extreme rainfall events is stressing the deteriorating infrastructure in the Southeast, exacerbated by lack of maintenance due to limited funding allocations. Many transportation and storm water systems have not been designed to withstand these extreme weather events. The combined effects of rising numbers of high tide flooding and extreme rainfall events, along with deteriorating stormwater infrastructure, are increasing the frequency and magnitude of coastal and lowland flood events.

Vector-borne diseases

The present climatic conditions in the southeast are suitable for adult mosquitoes of the species Aedes aegypti, which can spread dengue, chikungunya, and Zika viruses, across most of the Southeast from July through September. The Southeast is the region of the country with the most favorable conditions for this mosquito and thus faces the greatest threat from diseases the mosquito carries (p. 754). Climate change is expected to make conditions more suitable for transmission of certain vector-borne diseases, including summer increases in dengue cases across every state in the Southeast, and it is

projected an increase in cases of West Nile neuro-invasive disease in both a lower and higher scenario (i.e., RCP4.5 and RCP8.5) (p. 755).

Shifting of Tornado Locations and Seasonal Timing

Scientists have detected a recent shift in the location and seasonal timing of tornadoes (Gensini & Brooks, 2018). There has been a significant decrease trend in the frequency of tornadoes over portions of Texas, Oklahoma, and northeast Colorado, while there has been a significant increase of tornadoes in portions of Mississippi, Alabama, Arkansas, Missouri, Illinois, Indiana, Tennessee, and Kentucky.

Presently, it is difficult for scientists to determine if this shift in tornado tracks are caused by anthropogenic factors; however, according to Gensini & Brooks, global and regional climate model studies suggest a general increase in severe weather frequency and variability in portions of the Midwest and Southeast that can cause these changes (2018). Furthermore, accumulating literature that examines tornado/severe weather frequency and variability also suggest that this trend may indeed be due to anthropogenic forcing (pg. 38). However, the authors indicated that future studies would be able to describe such causal mechanisms. The authors concluded that the economic losses associated with tornadoes will continue to increase in the future because of the combination of an increase in risk and exposure in areas that are not built to stand this shift.

Methods

The Team selected an exploratory-qualitative research method for this study for the following reasons: (1) Exploratory research is defined as an attempt to discover something new and interesting by working through a research topic (Swedberg, 2020); (2) exploratory research is particularly appropriate for this study because it is empirical in nature and the objective is to increase the knowledge of a topic that is little known (par. 49); and (3) exploratory studies can be about participant observations that require surveys and (focused) interviews, which was the case for this study.

Ethics Approval

The Team obtained ethics approval before contacting any subject community, communities' partners, or participants. The Team worked with SterlingIRB (2022) to obtain the respective ethical approval for the research. SterlingIRB is an independent institutional review board dedicated to providing IRB review services, expert guidance, and regulatory compliance for research involving all vulnerable populations, including prisoners, cognitively impaired persons, pregnant women, and children.

The Team submitted to SterlingIRB documentation related to the data collection protocol including locations (see next section), an anonymous survey (Appendix B), interviews' questions (Appendix C), and consent forms (Appendix D). SterlingIRB reviewed the documentation provided and granted consent for the research.

Selection of Subject Communities and Locations (Objective #1)

According to the objectives described in the Introduction section of this paper, the subject communities were selected to meet three main criteria: (1) rural communities that can portray an accurate representation of the rural Southeast; (2) historically ethnically

diverse, and (3) economically challenged. The Team opted to add an additional criterion to facilitate the collaboration with local partners, which was the proximity of the community to a higher education institution.

The Team selected the counties' seats to host the workshops. The counties' seats are the administrative centers where the government seats, or capital cities of a county. Figure 1 shows the counties selected with the estimated populations according to the U.S. Census Bureau as well as the seats of the counties where the workshops took place.

Criteria for the Selection of Communities' Partners (Objective #2)

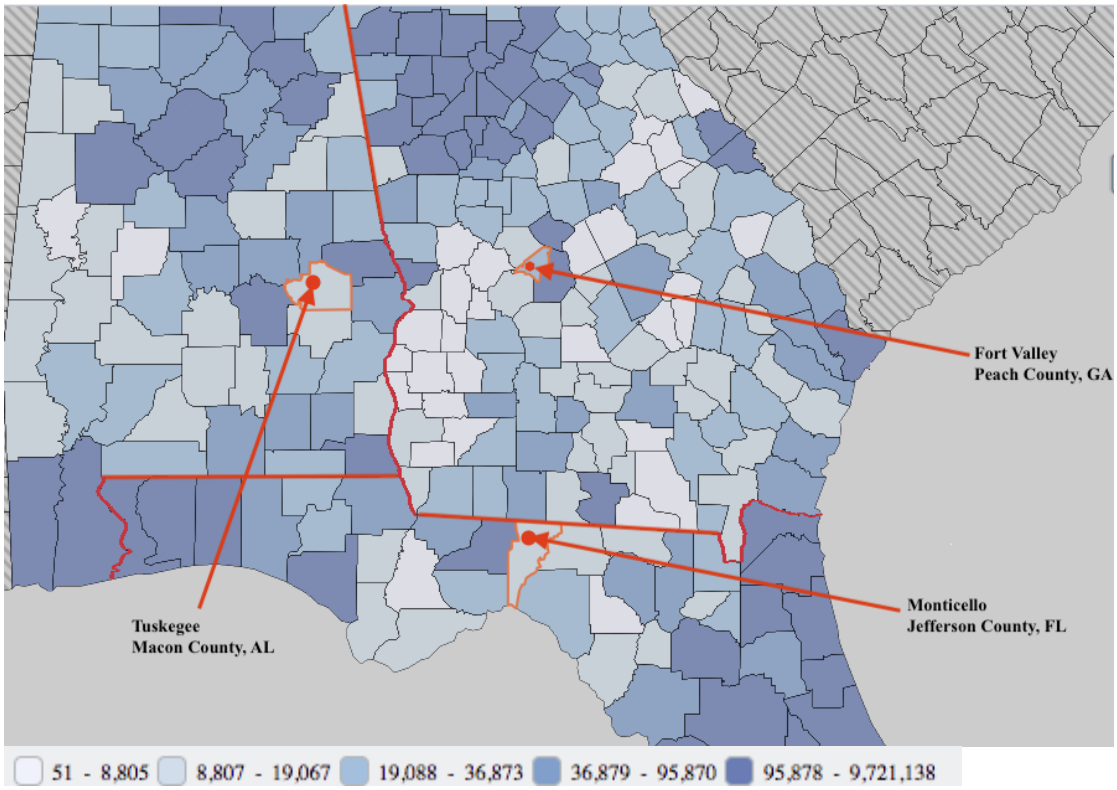
The Team contacted via phone and email potential partners from the following groups (1) local-governments, (2) local higher-education institutions; (3) local non-profits (e.g., environmental and religious institutions); and (3) local organizations representing for-profit groups (e.g., chambers of commerce).

The Team also performed a pre-workshop visit to each one of the selected communities and spoke with a variety of potential local partners who could be interested in the workshop. During these visits, The Team also explored locations to host the workshop.

Subject Communities Selected and Communities' Partners

Based on the criteria above, The Team selected the following communities: Macon County in Alabama; Peach County in Georgia; and Jefferson County in Florida (see Figure 1). Local universities expressed interest in participating and hosting the workshops and they were selected as the preferred communities' partners. A summary of the criteria for each one of the communities is shown in Table 1 (pg. 7).

Figure 1. *Locations Selected and Population Estimates*



Note: Modified map showing the counties and the cities selected. The map shows U.S. Census estimated populations in the respective counties on July 1, 2022. Retrieved and modified on July 20, 2023 from: https://www.census.gov/quickfacts/fact/map/fortvalleycitygeorgia,jeffersoncountyflorida,maconcountyalabama,peachcountygeorgia/PST045222

Subject Community #1: Macon County, Alabama. Macon County is located in the east central part of the State of Alabama 42 miles east of its capitol Montgomery (see Figure 1). The county's area is 608.8 square miles. The county was formed in 1832 from land ceded by the Creek people following the United States Congress's passage of the Indian Removal Act of 1930. Macon County took its name to honor Nathaniel Macon, a former Speaker of the United States House of Representatives and later Senator of North

Carolina in the United States Congress, who defended slavery (Price, 2008). Macon County's seat is Tuskegee.

Macon County is located in the "Black Belt" region of Alabama. This term was originally referred to the region's rich black soil, but it took an additional meaning when settlers brought African American slaves to work in cotton plantations (Alabama Genealogy & History Network, n.d.). After the American Civil War, many freemen stayed in the region. Since then and until now, Macon County's population has been majority black, which presently is around 79.9% of the total population.

The percentage of people living in poverty in Macon County is quite large (27.5%) compared to the state's percentage (16.10%). Educational services, health care, and social assistance sectors as the largest employer with 30.8% of the labor force, followed by Arts, entertainment, recreation, accommodation, and food services with 12.3%, and the Professional, scientific, management, administrative, and waste management services with 11.3% (U.S. Census Bureau, n.d.b).

Tuskegee University. This HBCU is located in the City of Tuskegee, which is the seat of the county. Created in 1881 by Lewis Adams, a former slave and local black leader, Lewis was able to negotiate with the then candidate for re-election to Alabama's Senate and former Confederate Colonel, W.F. Foster, to build the first school for black people in the county in exchange for the support of the black community during the elections. The Tuskegee Normal School for Colored Teachers was created with the support of a former slaveholder and banker, George W. Campbell, who shared a commitment to the education of black people (Tuskegee University, n.d.).

Campbell contacted the Hampton Institute in Virginia looking for a teacher. The President of the Hampton Institute at that time, Samuel Armstrong, recommended Booker T. Washington to become the first principal of the school. The school opened officially on July 4, 1881. Washington was principal of the school until his death in 1915. During Washington's tenure, the school expanded to 1,500 students, $2 million endowment, 40 majors (at that time called "trades"), 100 buildings, and about 200 faculty. Since then, Tuskegee has risen as a prominent national center of higher education for African Americans. In 1965 Tuskegee University was declared a National Historic Landmark (National Parks Foundation, n.d.) and in 1985 attained University status. Presently, Tuskegee University has more than 3,000 students in more than 70 buildings, and the extension of the campus, including farm and forestland, is around 5,000 acres (Tuskegee University, n.d.).

Subject Community #2: Peach County, Georgia. Peach County is located in the center of the state of Georgia (see Figure 1). Founded in 1924, Peach County is the newest county in the state. The county is named after its location in a peach-growing region (Krakow, 1975).

With an area of 150.3 square miles, the county is mainly located in the lower Ocmulgee River sub-basin, which is part of the Altamaha River Basin with a small section in the Upper Ocmulgee River Basin in the north and the Flint River sub-basin of the ACF River Basin in the west. Its county seat is Fort Valley.

The higher sector of employment is the educational services, health care, and social assistance sector (24.2%), followed by the retail-trade sector (16.3), and the professional, scientific, management, administrative and waste sector (10.4%). The

poverty level (19.2%) is higher than in the state of Georgia, which is 14.0% (U.S. Census Bureau, n.d.d).

Fort Valley State University. Formerly Fort Valley State College, Fort Valley State University (FVSU) is located in the city of Fort Valley, which is Peach County's seat. The university was created in 1939 as a result of consolidation of The Fort Valley High and Industrial School, founded in 1895, and the State Teachers and Agriculture College of Forsyth, which was founded in 1902 (FVSU, n.d.a).

The Fort Valley High and Industrial School was the result of a petition by 15 black men, half of them former slaves, and three white men, to the Superior Court of Houston County, GA to legalize the creation of the school.

In 2019, the total enrollment was 2,624 students. The university offers two associate degrees, 29 baccalaureates, eight master's programs, and one educational specialist program (FVSU, 2019).

Subject Community #3: Jefferson County, Florida. Located in the northern part of Florida bordering the State of Georgia, Jefferson County has an area of 637 square miles (see Figure 1). Although Jefferson County is part of Tallahassee's Metropolitan Statistical Area, it is considered a rural county in Florida (Florida Department of Health, n.d.). Its county seat is Monticello. Jefferson County was named after President Thomas Jefferson, who died the year before the county was created in 1827.

Jefferson County's economy has been centered on agriculture since its foundation. Cotton production and slaves were vital to the economy before the Civil War (Rivers, 1983). The county was ranked third in population among middle Florida counties and it was second to Leon County in the cultivation of cotton (p. 412).

By 1860, 64.5 percent of the population in Jefferson County was slaves (pg. 406). As many other counties in north Florida where the majority was freedmen, white leaders enacted laws to ensure that only white people capable of protecting the interest of white owners were elected (Works Progress Administration, 1939). During this period, Florida's constitution was reframed hinting that people of color were "unqualified" and "entrusted" to execute the law (p.3). Racial violence against black people rose in north Florida counties. Madison County, adjacent to Jefferson County, became one of the major contributors of lynching in the country (Davis, 1989).

The economy of the county is in transition from traditional agriculture and forestry, which nowadays represents only 24%, to services (Jefferson County, n.d.). The county serves as a suburb for Tallahassee, and almost half of the non-farm workforce commutes outside the county for employment, many to professional, academic, state government, service and trade jobs. Unemployment is consistently low (4.2%) compared with the state's average, which is 4.6%; however, people under the level of poverty in the county is higher (17.1%) than the state's average (13.1%) (Florida Health Charts, n.d.).

Florida State University Center for Ocean-Atmospheric Prediction Studies (COAPS). Florida Agricultural and Mechanical University (Florida A&M) and Florida State are a short distance from Jefferson County (less than 30 miles). Florida A&M, which is an HBCU, was contacted to serve as a partner but unfortunately declined.

Florida State University accepted to be a collaborator and one of its scientists attended the workshop and she is willing to serve as a partner (see Appendix A). This researcher works for Florida State University Center for Ocean-Atmospheric Prediction Studies (COAPS), which mission is "to promote interdisciplinary research in air-sea

interaction, the coupled ocean-atmosphere-land-ice earth system, and climate prediction" (COAPS, 2022). COAPS was founded in 1996 by the Florida Board of Regents and had led to new breakthroughs in understanding coastal upwelling, El Niño, La Niña, and hurricane effects on the ocean.

Participants

All members of the communities older than 18 years old were invited to participate in the workshops. The Team advertised the workshops using a variety of methods. For the workshop in Peach County, The Team visited local businesses, posted advertisements in public spaces and attended the Peach Festival in Fort Valley (see Figure 2). For the workshop in Macon County, The Team coordinated with administrators at Tuskegee University and local community leaders to disseminate the details of the workshop using their regular media. For the workshop in Jefferson County, The Team promoted the event in public spaces, to local businesses, and in the local newspaper (see Figure 3).

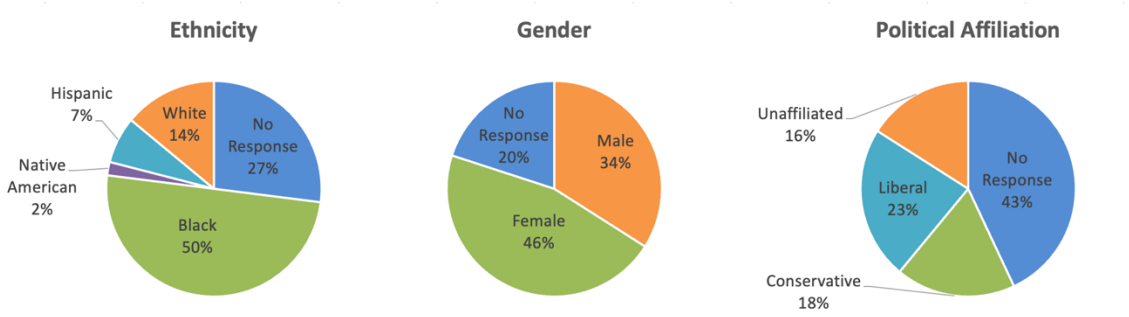
The Team communicated to potential participants the objectives of the study (see Introduction section in this paper), the goals of the workshop, and the Consent of Participation required to attend the workshop (see Appendix B). The workshops took place on June 4th, 2022 in Fort Valley State University (Peach County, GA); June 10th, 2022 in Tuskegee University (Macon County, AL); and July 29th in Monticello (Jefferson, County, FL). The total number of participants in the study was 44. Figure 3 shows demographics including gender, ethnicity, and political affiliation.

Instruments

The Team developed three instruments, each one to meet Objectives #3, #4, and #5 (see the objectives in the Introduction section). For Objective #3, The Team developed an anonymous survey based on the Climate Change Risk Perception Model (CCRPM) (Linden, 2014). To meet objective #4, The Team developed a workshop based on the Crate & Fedorov model (2013). To meet objective #5, The Team (i.e., Exposure Lab) developed a questionnaire based on the anonymous survey (see next session) and impressions about the workshop.

Figure 2. *The Team at the Georgia Peach Festival in Fort Valley, GA*

Figure 3. *Demographics of Participants in the Study*



The Anonymous Survey (Objective #3)

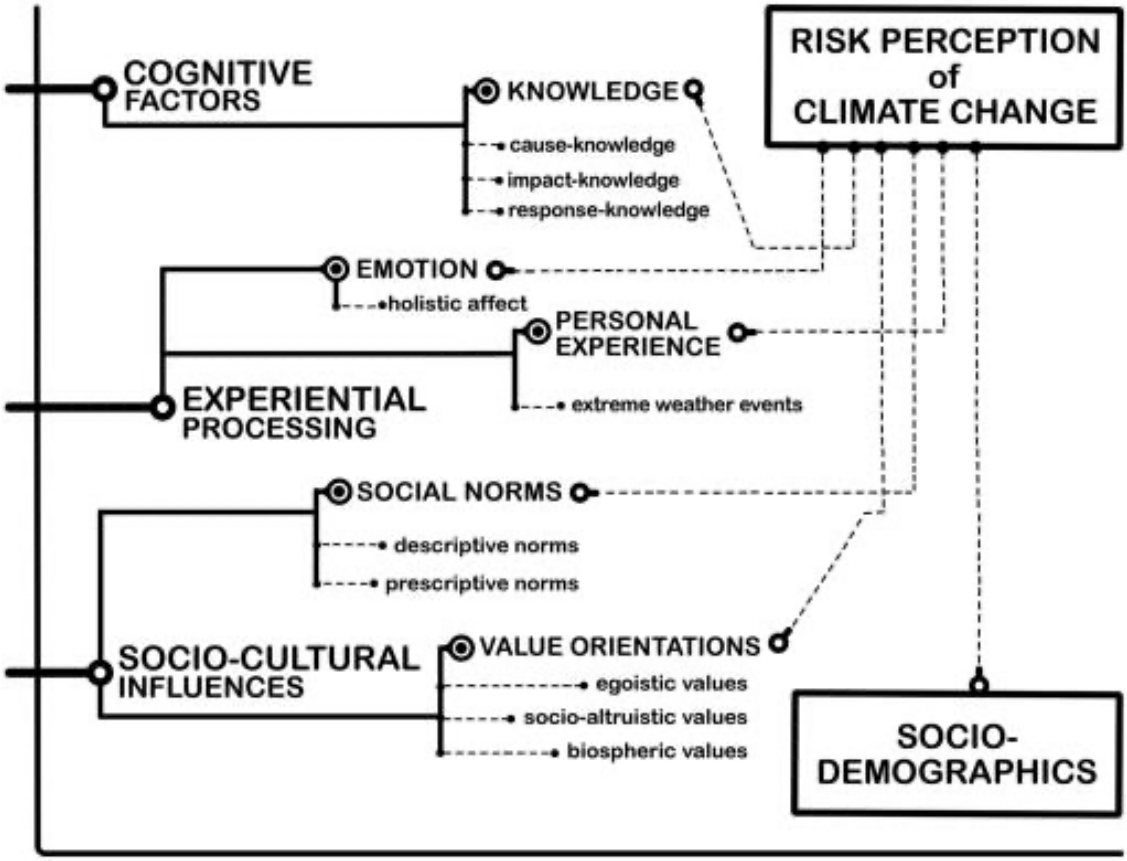
Objective #3 of this study required the Team to conduct an anonymous survey of community members to collect data about their perceptions related to climate change and climate change adaptation. In order to meet this objective, The Team developed an anonymous survey based on the Climate Change Risk Perception Model (CCRPM) (Linden, 2014). The goal of CCRPM was to combine and integrate cognitive, experiential, and socio-cultural factors to collect climate change risk perceptions. The framework of the model is summarized in Figure 4.

The CCRPM model was tested empirically on a national sample in the UK. Results indicated that CCRPM was able to explain nearly 70% of the variance in risk perception. Linden (2014) identified significant predictors in the responses including gender, political orientation, knowledge of the causes, impacts and responses to climate change, social norms, value orientations, and personal experience with extreme weather.

The researcher found that experiential and socio-cultural factors explained significantly more variance in risk perception than either cognitive or socio-demographic characteristics. Results of the study also indicated that climate change risk perceptions can be conceptualized along two key dimensions: personal and societal risk judgments

and that both dimensions have different psychological antecedents. The final anonymous survey developed by The Team and its CCMRP mapping is shown in Appendix B.

Figure 4. *Climate Change Risk Perception Model (CCRPM)*



Note: Reprinted from "The social-psychological determinants of climate change risk perceptions: Towards a comprehensive model" by Linden, S. 2015, *Journal of Environmental Psychology, Volume 41, 2015, Pages 112-124.*

The Workshop (Objective #4)

The Team developed and performed a workshop to guide community members to discover and understand communities' assets, priorities and needs to address the most pressing issues of climate change in the county. The workshop was divided in three sessions: Session 1 was designed to exchange knowledge about the impacts of climate change in the county; Session 2 was designed to identify local assets; and Session 3 was designed to give priorities using a hypothetical climate future based on scientific projections.

The workshop Session 1 was modeled after knowledge exchange work carried out by Crate & Fedorov in Northeastern Siberia (2013). In this methodology, the authors developed a process to allow audience members to first share their local knowledge and observations of local change, allowing residents to be heard, bring their knowledge to the forefront, and set a precedent for open audience input throughout the exchange. The questions the authors asked included:

- What changes are you seeing?
- Why do you think it's happening?
- How is it affecting you or your community?
- What if it continues for the next 10 years?

These questions are essential to understanding what is happening now, but also what future scenarios (10 years from now) carry significant impacts.

The questions above were then augmented in Siberia and in other locations through researcher presentations on local, regional and national climate impact data followed by further discussion between researchers and community members (Crate,

2015). The Team followed suit with an overview of downscaled local climate data, as well as other regional and national climate data.

Section 2 of the workshop was also based on participatory knowledge exchange, and the goal was to share what community resources are most essential to their health and well-being (i.e., local assets). According to Moser & Stein (2011), individual and community assets give people the capability to be and act, and include physical, financial, human, social and natural capital. As a result, populations that have numerous healthy assets are likely to be less vulnerable to environmental and other stressors than communities with few and/or already threatened assets (Ebhuoma, Simatele, Tantoh, & Donkor, 2019). As such, in order to understand each community's vulnerabilities and levels of resilience, the second phase of the workshop asked participants to both identify important community assets and prioritize those deemed most critical to community health and well-being.

In the final Section of this workshop, community members and researchers worked together to identify those priority assets that are most at-risk and why, with recognition that climate change may amplify those vulnerabilities but may not specifically be the cause. This effort acknowledges that vulnerability research can be problematic if it only assesses climate impacts without understanding the rich and systemic interplay of non-climatic, socio-economic drivers of vulnerability (Ford et al., 2018). In response, participants assessed their risk and resilience to both climate and non-climate stressors to better understand the human-environment interactions that will impact their futures. As such, the final knowledge sharing session explored critical assets and how they perform using exploratory scenarios already identified in the first session

by community members (Avin & Goodspeed, 2020). A modified Framework for Participatory Impact Assessment was applied to the process where 1) participants identified future scenarios in Workshop Session 1 and 2) stakeholders analyzed the impact of future scenarios on their critical assets (Morris, Tassone, De Groot, Camilleri, & Moncada, 2011). The design of the workshop is shown in Appendix C.

Video-Interviews (Objective #5)

The Team performed video-interviews of community members to collect stories about how these communities are dealing with the impacts of climate change and what these communities are doing to adapt to these changes. The primary goal of these videos was to capture climate stories. The questions for the video-interviews were based on the anonymous survey designed by The Team related to perceptions about climate change and impressions about the workshop (see Appendix B).

Results – Findings

The Team classified the findings in three sections: (1) Findings from the anonymous survey about climate perceptions (objective 10); (2) findings from the Workshop; and (3) findings from the video-interviews.

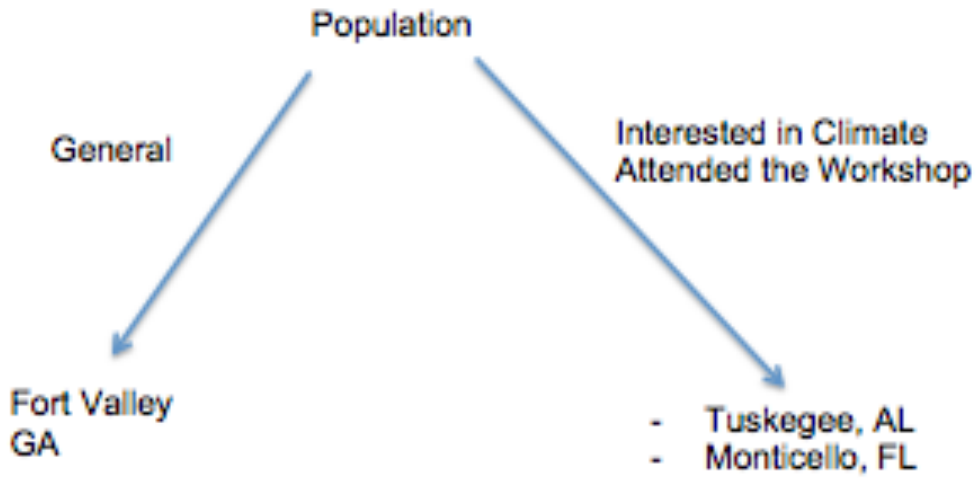
Results Anonymous Survey

The Team distributed and collected the anonymous surveys on June 3rd and 4th, during the Georgia Peach Festival in Fort Valley (Peach County, GA), on June 10th in the City of Tuskegee (Macon County, AL), and on July 29th in the City of Monticello (Jefferson County, FL). The anonymous survey is shown in Appendix B.

Most of the population who responded to the survey at Fort Valley were attending the Georgia Peach Festival, which was scheduled for June 3 and 4, but not the workshop, which was scheduled for June 4th. On the contrary, most of the population who responded to the survey at Tuskegee and Monticello were attending the workshops.

During the evaluation of the responses, The Team detected that the majority of the participants in the workshop tended to have a liberal political orientation. To overcome this bias, The Team decided to split participants in two groups: (1) General population, meaning those who filled out the survey at the Georgia Peach Festival in Fort Valley, and (2) the population interested in climate change who attended the workshops at Monticello and Tuskegee (see Figure 5).

Figure 5. *Division of Population*



Note: To analyze the responses to the anonymous survey, The Team split the population in two to avoid a bias from the population attending the workshop.

Results Question #1

Around half of the General Population surveyed in Fort Valley indicated that climate change is affecting their communities (Figure 6). For the population more interested in climate change, more than 75% of the population indicated that climate is affecting their communities.

Results Question #2

Over one-third of the General Population surveyed in Fort Valley indicated that climate change is natural, and around 40% indicated that it is human and natural caused (both) (Figure 7). A minority (7%) thinks that humans are solely responsible. Almost the same amount doesn't think changes in climate are happening. For the population more

interested in climate change, almost one-third think that humans are causing it and more than one-half think that it is both natural and human caused.

Figure 6. *Results Question #1 Anonymous Survey*

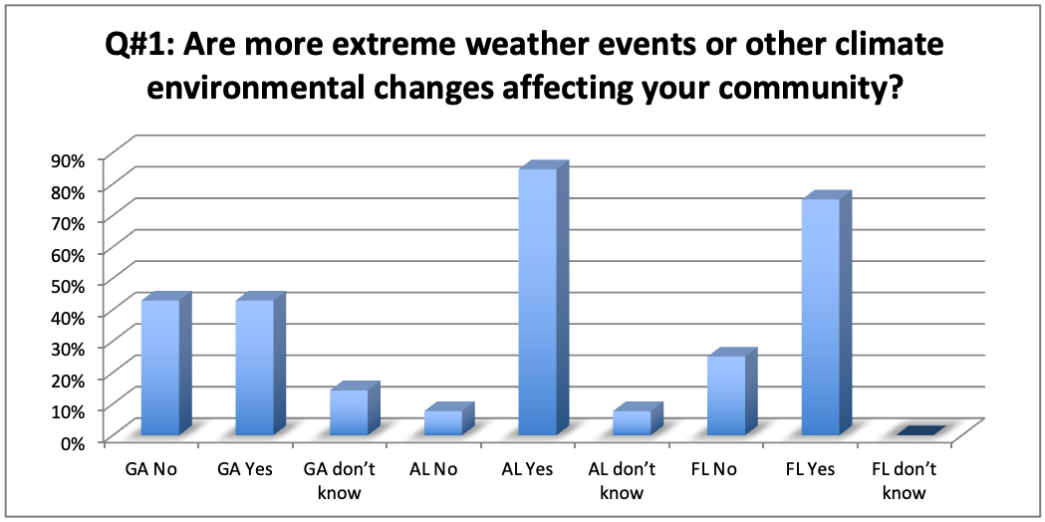
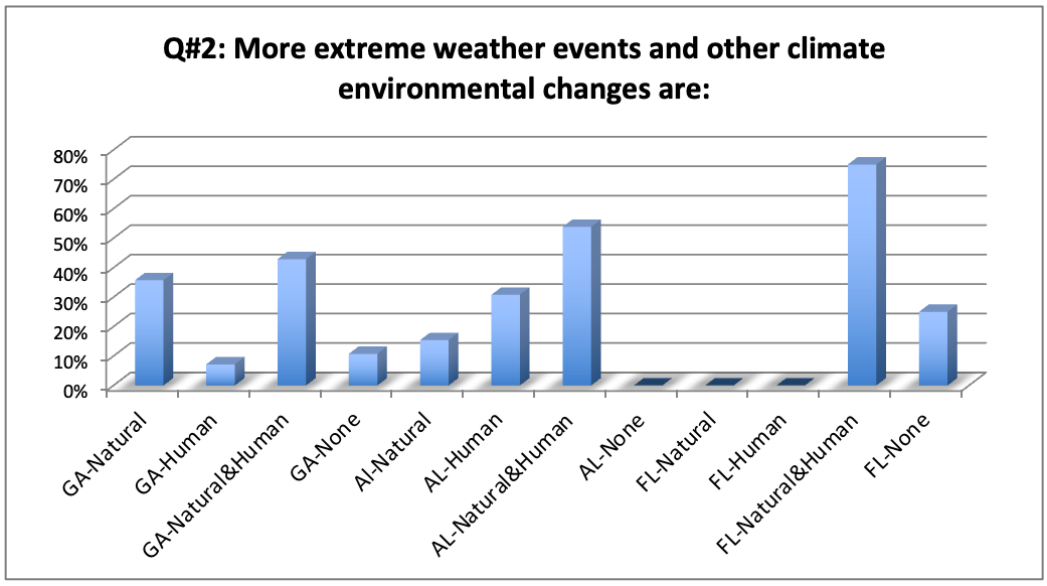


Figure 7. Results Question #2 Anonymous Survey

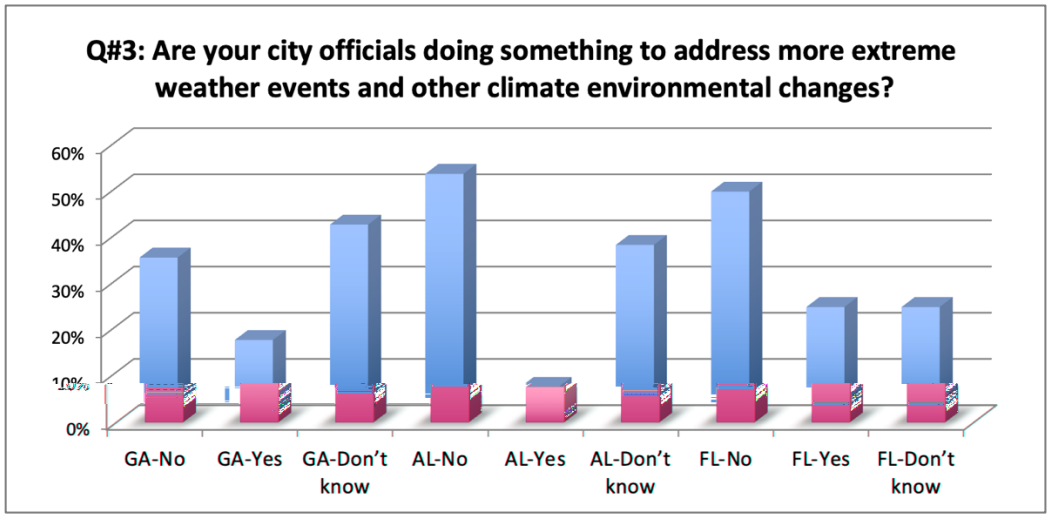


Results Question #3

As it is observed in Figure 8, over 40% of the General Population surveyed in Fort Valley indicated that they don't know if city officials are doing something to address

climate change. Around one-third indicated that officials are not doing something. Around 20% think that their officials are doing something. For the population more interested in climate change, more than half of the population think that officials are not doing something; more than 25% of the population indicated that they don't know.

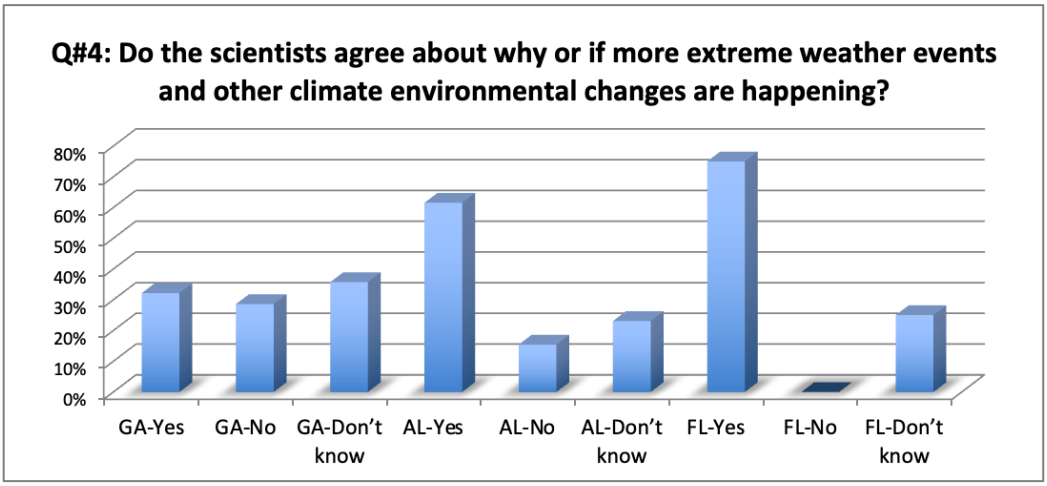
Figure 8. *Results Question #3 Anonymous Survey*



Results Question #4

One-third of the General Population surveyed in Fort Valley indicated that scientists agree about climate change, one-third indicated that scientists don't agree, and over one-third doesn't know (Figure 9). For the population more interested in climate change, more than 60% indicated that scientists agree about climate change, while around 15% indicated that scientists don't agree. Around 25% don't know.

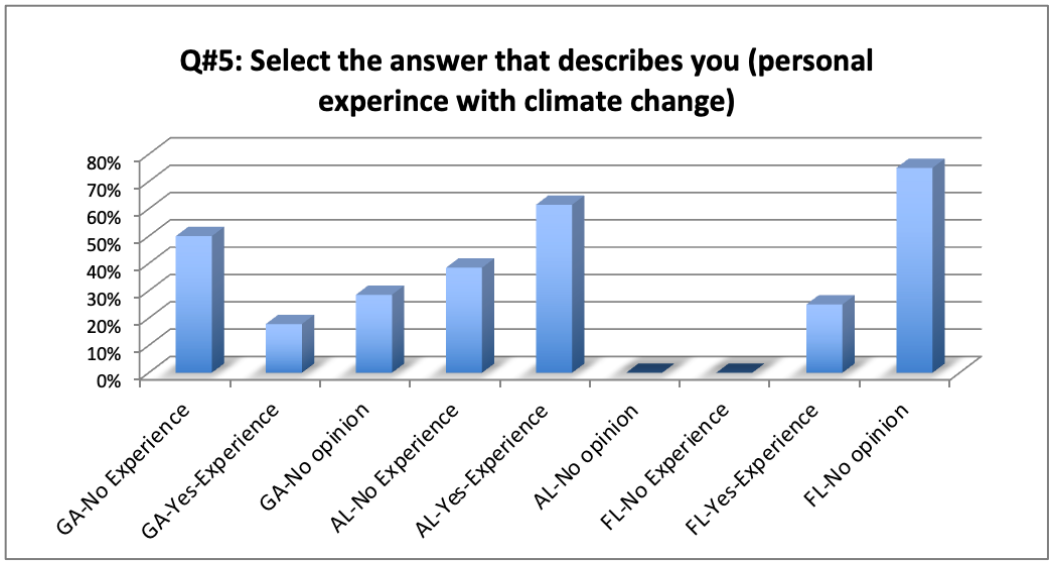
Figure 9. *Results Question #4 Anonymous Survey*



Results Question #5

One half of the General Population surveyed in Fort Valley has a strong feeling that more extreme weather events and other climate environmental changes are happening but they don't have any personal experience (Figure 10). Less than 20% have a real personal experience. Almost one-third doesn't feel related to this question. For the population interested in climate change, 62% have had a personal experience with climate change; more than one-third thinks that more extreme weather events are happening but don't have a personal experience.

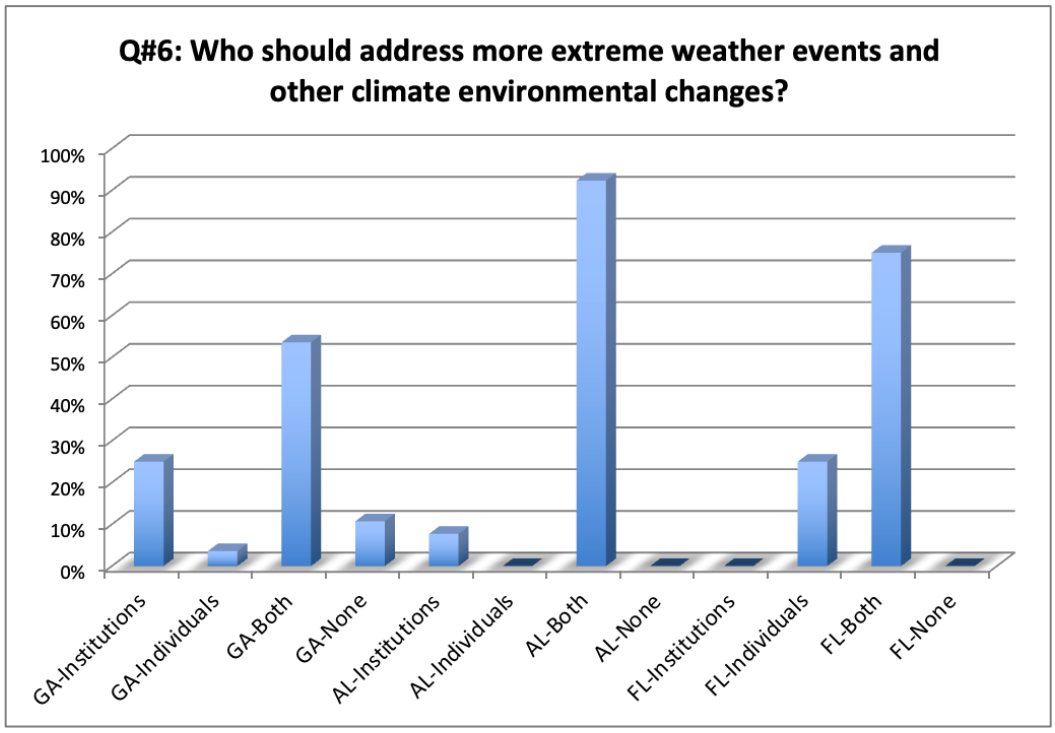
Figure 10. *Results Question #5 Anonymous Survey*



Results Question #6

More than one-half of the General Population surveyed in Fort Valley indicated that climate change should be addressed by institutions and by individuals (both) (Figure 11). This number was higher for the population very interested in climate change (more than 75%). 25% of the General Population in Fort Valley indicated that institutions should address climate change, and a very small percentage (4%) indicated that individuals should address climate change. This number was higher for the population interested in climate change (25%). One-tenth of the General Population in Fort Valley indicated that nobody should address climate change, while none of the participants in the workshop indicated that nobody should address climate change.

Figure 11. *Results Question #6 Anonymous Survey*

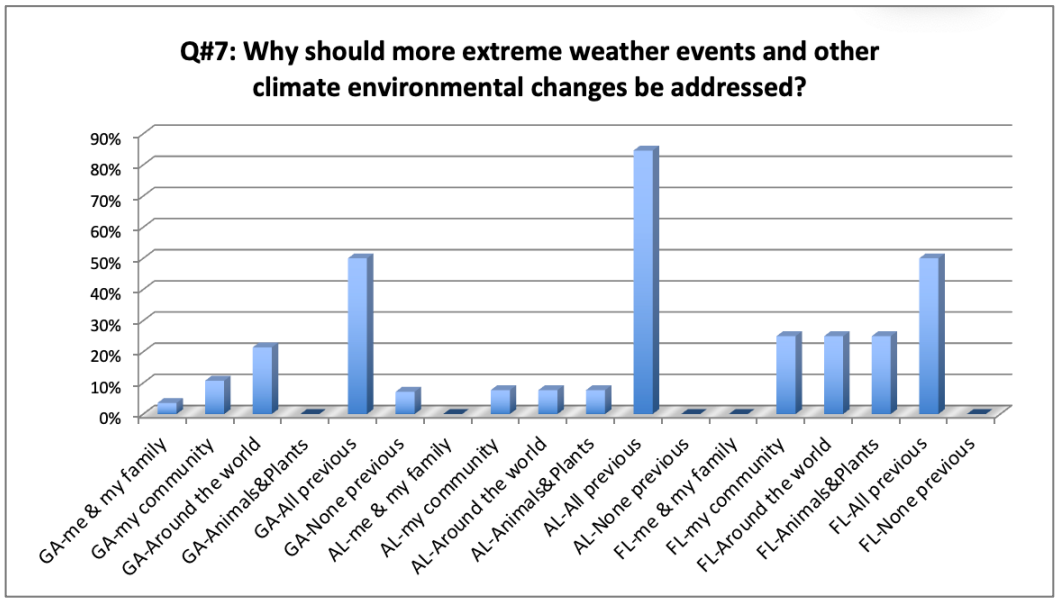


Results Question #7

Half of the General Population surveyed in Fort Valley indicated that climate change and extreme weather events should be addressed because it affects everybody, including family members, their communities, people around the world, and animals and plants (Figure 12). Around 20% of the General Population indicated that it should be addressed because it is affecting people in other countries. Almost one-tenth of the population indicated that these events should not be addressed.

For people interested in climate change, there were less concerned about climate change affecting their families (0%) and more concerned about climate change affecting everybody (85% in Alabama and 50% in Florida).

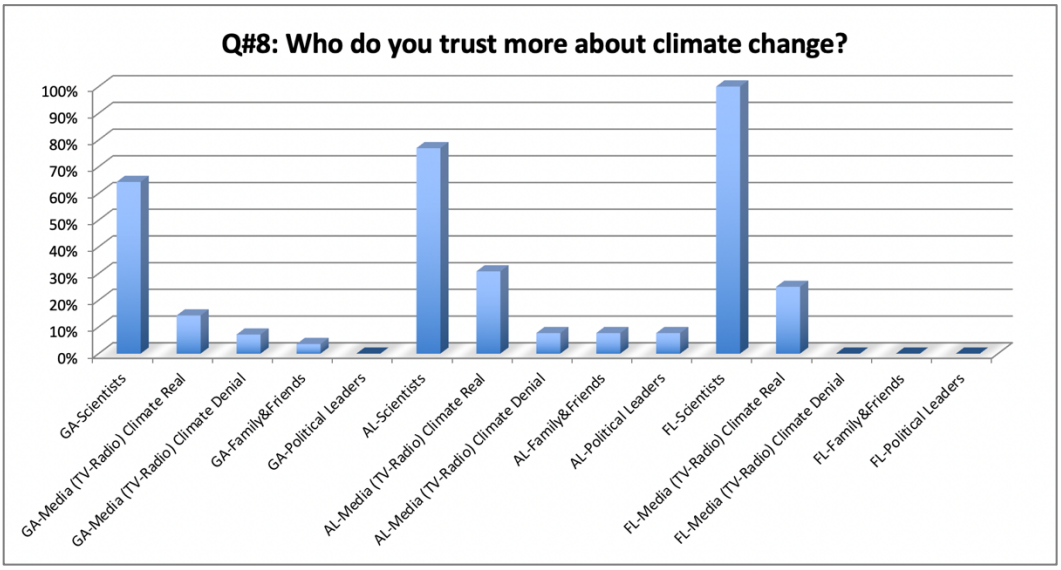
Figure 12. *Results Question #7 Anonymous Survey*



Results Question #8

Over 60% of the General Population surveyed in Fort Valley indicated that they trust scientists more about climate change than other sources (Figure 13). More than one-tenth indicated that the media should be trusted. None of the people in Fort Valley indicated that politicians should be trusted. For the population more interested in climate change, more than 70% indicated that scientists should be trusted, and around one-third think that the media (TV-radio) should be trusted.

Figure 13. *Results Question #8 Anonymous Survey*



Results of the Workshops

Peach County, GA – Challenges

The Team implemented the workshop on June 4th, 2022 at Fort Valley State University (FVSU). During the workshop attendees expressed the widespread mistrust of the community to federal organizations. This mistrust has an historical connotation: For more than a century, the population has been exposed to contaminants and it was not until 1980s that the EPA began working on the issue without acceptable results. The EPA identified substances in the air and water declared as *contaminants of concern* that include antimony, arsenic, cadmium, lead, manganese, benzo(a)pyrene, hexachlorobenzene and pesticides (EPA, 2019). As a result, life expectancy in Peach County is one of the lowest in the state and in the country (Institute for Health Metrics and Evaluation, 2014).

The Woolfolk Chemical Works, Inc. Superfund Site. Fort Valley was the site of the Woolfolk Chemical Works, Inc., its successor, and several other companies that produced, formulated, and packaged pesticides, herbicides, and insecticides (including arsenic and lead-based products) from 1910 to 1999 (EPA, 2019). The packaging and the use of an unlined disposal pit resulted in contamination of the site. Groundwater in the surficial and aquifers were contaminated with pesticides and inorganics. The Tuscaloosa Aquifer groundwater was also contaminated with pesticides (pg. 2).

The facility operated until 1980, when the Georgia Environmental Protection Division (GAEPD) received complaints from residents that the company was discharging waste away from the site. The owner of the company ceased operations in 1984, capped the on-site disposal, and sold most of the buildings and property to Peach County Properties, Inc. with the condition that the owner would conduct a removal action to remediate the facility and surrounding soils. However, the owners detected a more extensive contamination than expected and the GAEPD decided to demolish several buildings and excavate some soil. Additional studies were conducted to determine the extent of the contamination, including surrounding residencies. It was found that about 60 surrounding parcels had their attics contaminated with arsenic. Contamination was also found in the stormwater system that drains away from the site (pg. 5).

The EPA listed the site under the Superfund Program's National Priority List (NPL) in 1988 and in 1989 informed the owners of the facilities of potential liabilities under CERCLA for response costs incurred at the site. The EPA signed an Administrative Order on Consent with the main owner in 1990, for the completion of the remedial investigation and feasibility study. The EPA completed the remedial

investigation in 1992, which included soils, groundwater, surface water, stormwater, sediments, and air (pg. 6).

The EPA findings indicated contaminated groundwater in the surficial water table, and aquifers with "unacceptable risk (cancer and non-cancer)" with arsenic as the main driver. They also found other substances that expose risks to human health such as beta benzene hexachloride (BHC), bis (2-ethylhexyl) phthalate, 1-2-dicloroethane, and tetrachloroethene (pg. 6). In 1993 the EPA determined that a removal action was necessary to eliminate the immediate threat to public health posed by the contaminated soil on residential properties and ordered the main owner of the facility to remove residential soil contamination, removal of arsenic dust from attics, excavation of part of the drainage ditch along the avenue close to the facility (this drainage ditch discharges water to the upper tributary of Big Indian Creek), relocation of some residents, purchase and demolition of homes, and demolition of a dioxin-contaminated building.

In 2009, the EPA increased the volume of soil removal based on the discovery of additional arsenic contamination in an area adjacent to the capped area (pg. 10). The EPA also allowed the treatment onsite of soils with arsenic concentrations between 317 mg/kg and 3,000 mg/kg via solidifications and stabilization, and for arsenic less than 2.5 mg/L, the EPA allowed disposal of the soil on-site in high density polyethylene lined cells. In 2004, the EPA allowed decontamination of attics with dust of arsenic greater than 71 mg/kg, and allowed the use of soils as backfill in unpaved areas (pg. 10).

In their final findings in 2019, the EPA indicated that remedy is not functional as intended in some of the contaminated areas (pg. 23). The EPA detected pesticide groundwater contamination in shallow surficial aquifers as well as in the water table, and

in the Tuscaloosa aquifers. Irrigation and portable wells have been found with pesticides exceeding the recommended cleanup levels as well. Groundwater has not been monitored since 2015 for other *contaminants of concern* such as bis (2-ethylhexyl), phthalate, acetone, chloroform, carbon disulfide, 1,2-dichloroethane, 1,2-dichloropropane, and tetrachloroethene.

In their final report, the EPA revised 2018 and 2019 groundwater reviews and "believe" that other sources of the former manufacturing facility "may be contributing to the groundwater plume(s) that have not been identified" (pg. 25). The EPA recommends updating the conceptual site model to identify potential sources of contamination, including irrigation pumping as a source of spreading of contaminants. They also recommend to implement a site-wide groundwater monitoring program for bis (2-ethylhexyl) phthalate, acetone, chloroform, carbon disulfide, 1,2-dichloroethane, 1,2-dichloropropane and tetrachloroethene.

Superfund Sites and Climate Change. According to the EPA, remedies at contaminated sites may be vulnerable to the impacts of climate change and extreme weather events (2023). Within the Superfund program, the EPA developed approaches that raise awareness of these vulnerabilities including prioritizing steps to adapt to a changing climate, and identifying measures to assure climate resilience of Superfund sites. The EPA also developed a series of site profiles that illustrate how climate adaptation is integrated into the Superfund program. Although the Woolfolk Chemical Works, Inc. Superfund Site is not included on this list, the EPA has included in their Superfund program for 2022-2023 the following opportunities:

- Deliver core training on climate adaptation.

- Update and expand the series of climate resilience technical fact sheets pertaining to contaminated site cleanups.
- Deploy technical capacity to provide climate vulnerability assessments.
- Expand vulnerability assessments of sites in communities located near contaminated sites.

Public Health Issues. It is not the goal of this research to establish causation between Fort Valley's Superfund site and the public health conditions in the area; however, there is a generalized perception in the population in Fort Valley that their poor public health condition is related to the Superfund site (see Table 2). This poor public health condition is reflected in life expectancy, which for females (76.7) and males (70.9) is lower compared to state's averages (79.7 and 75 respectively) and to the entire country's average (81.5 and 76.7 respectively) (Institute for Health Metrics and Evaluation, 2014). Furthermore, infant mortality is higher in Peach County than the state and the country (11.6 versus 7.6 in the state and 5.9 in the country) (Professional Research Consultants, Inc., 2018).

Professional Research Consultants, Inc., a public health consulting company located in Nebraska, prepared a report for *The Medical Center of Peach County-Navicent Health* in Georgia titled *2018 Community Health Needs Assessment Report* (2018). In the report, the consultants concluded that cancer is the leading cause of death in the area (pg. 13), which was 206.2 deaths per 100,000 between 2014 and 2016. This rate is much higher than the deaths of cancer in Georgia (162.9), and the entire country (158.5) during the same period of time (pg. 46).

Table 2. *Age-Adjusted Deaths Rates for Selected Causes in Fort Valley, GA (2014-*

Peaches are blooming earlier making the ripening happening before the start of the fall, and (2) milder winters impede the plant buds from breaking endodormancy, which produces abnormal patterns of fruit development and even blooming failure (Vanalli Casagrandi, Gatto, and Bevacqua, 2021). In 2023, more than 90 percent of the Peach State's peaches were lost after an abnormally warm winter and a late-season freeze (Sayers, June 5, 2023).

To adapt to climate change, horticulturists at the University of Georgia are breeding new varieties that require fewer chill hours (Gringlas, August 2, 2022); however, producing a new variety is not easy. For example, a new breed may require fewer chill hours, but blooming too early can make the variety vulnerable to late frosts. Other considerations include diseases, humidity or drought (parag. 23).

Peach County, GA - Other Challenges. Beyond the concerns discussed above, the attendees expressed many others, listed below:

- Energy burden in the region, defined as the percentage of gross household income spent on energy costs (Department of Energy, n.d.)
- Red-lining and gentrification in the commercial center
- Intimidation to Latino immigrants who work on the fields
- Chemical contamination from agriculture and chicken farms
- Lack of leadership and unions to defend workers
- Isolation of the university from the community
- Food deserts

Peach County, GA - Assets and Main Stakeholders

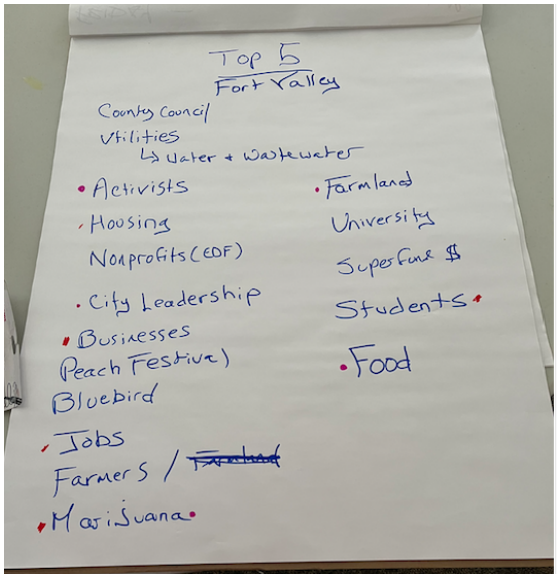
Attendees to the workshop in Fort Valley identified local assets and stakeholders (Figure 14). The assets identified were:

- Farmers and farmland including Marijuana farms
- Businesses such as the main manufacturing facility (Blue Bird buses) and the Georgia Peach Organization
- Fort Valley State University (FVSU) and students
- Utility companies
- County council and the city leadership
- Activists and non-profits
- Food production in the area.
- One interesting asset selected by the attendees was the Superfund site, which was considered as an asset as it provides opportunities such as obtaining grants and others.
- The top five stakeholder/organizations identified were the following:
- Activists
- Farmers and farmland
- Business, and FVSU Students

Macon County, AL – Challenges

The SCEN workshop in Macon County, AL took place on June 10th, 2022 at Tuskegee University. This workshop had a large number of attendees and it was the most structured of the three workshops, thanks to the collaboration of faculty and staff at Tuskegee University (Figure 15).

Figure 14. *Workshop Peach County, GA*



For the Worksheet #1, attendees identified some of the most important challenges in the community as the following:

- Interruptions of power, stormwater damage-erosion, and roof damage caused by intensive rains and tornadoes.
- Climate change is affecting the community financially and the public mental health.
- Alabama still suffers from inequities and discrimination
- Flooding, deforestation, bad air quality days, more tornadoes and hurricanes.
- Rain, warming, wildfires, drought, tropical storms.
- Shifting ecology, back-to-back weather events, unpredictable seasons, new pest problems.
- Lake Tuskegee - locals used to be able to eat the fish and swim, but not anymore.
- People lack love of self, love of God, along with lack of love for each other. A lack of critical thinking and lack of love.

Figure 15. *Workshop Macon County, AL*

Macon County, AL – Rivers Contamination. Attendees to the workshop expressed their concern with the contamination of the rivers in Alabama. In 2022, The American Rivers Organization declared two rivers in Alabama as America's top-ten most endangered rivers, *The Coosa River* and the *Mobile River* (2022).

In the case of the Coosa River, the American Rivers organization rated the river as the fifth most endangered river in the United States because of the waste produced by millions of tons of chicken feces from industrial poultry farms, which are discharging their wastewater into the water stream (American Rivers, 2022b). According to the Center for Biological Diversity, "The Coosa River is the site of the greatest modern extinction event in North America with extinction of 36 species following construction of a series of dams" (2010, parag. 4). The organization declared the extinction in the river of at least 34 species of fishes and snails and six species of mussels.

The Mobile River was ranked as the third most endangered river in 2022 because of the leaking of coal ash from Alabama Power's Plant Barry, which contains more than 21 million tons of coal ash in a pond that leaks arsenic and other pollutants into the river (American Rivers, 2020c).

Macon County, AL – Tornadoes. As it was indicated in Chapter One, scientists have detected an increase of tornadoes in portions of Mississippi, Alabama, Arkansas, Missouri, Illinois, Indiana, Tennessee, and Kentucky (Gensini & Brooks, 2018). The potential impact of these tornadoes on mobile homes is 4.5 times (i.e., 350%) greater in Alabama than in Kansas (Strader & Ashley, 2018). The reason is that Alabama, in comparison to other states impacted by tornadoes like Kansas, has a greater number of mobile homes and these mobile homes are widely distributed. According to Strader and Ashley, the Southeast's mobile home residents are one of the most socioeconomically and demographically marginalized populations in the United States and are more susceptible to tornado impacts and death.

Macon County, AL – Exploratory Scenarios & Assets

Participants at the Workshop in Tuskegee identified the following assets (See Appendix F for more details):

- The agricultural sector in Alabama
- Tuskegee University
- Good Internet connectivity in the county
- Efforts to reduce waste in the county (Zero Waste), and
- The network of hospitals and healthcare system in the county

For the Exploratory Scenarios exercise, attendees participated actively and proposed the following scenarios (see Figure 16):

- Mosquito born pandemic emerges with 25% mortality rates
- Category 2 hurricane stalls over the county for 5 days-droops of 50% rain (I-85 – the main interstate in the county is washed out)
- Tuskegee has 105F for one month
- Tuskegee University spearheads innovation in agriculture (marijuana/hemp)
- Tuskegee announced funded land trust and pilot designs of affordable housing

Figure 16. *Exploratory Scenarios Macon County, AL*

Note: see Appendix F for detailed results

Results of the Exploratory Scenarios exercise in Macon County, AL are shown in more detail in Appendix F. In most of the scenarios, Tuskegee University played a fundamental role as an important stakeholder to prepare the county for climate resilience, specifically in areas of research such as mosquitos and pollutants control; diverse

agriculture advances; medical and other public health treatments including telemedicine, mental health support, and the benefits of medical marijuana; technological advances; and economic resilience.

A second stakeholder identified during the exercise was the federal government. According to the attendees, much of the research done at the university, which is necessary to prepare the county for impacts of climate change, will not be possible without federal funding. Federal funding will also be necessary to increase the university's faculty and enrollment, maintain roads and bridges, build more hospitals, provide funding for the installation of renewables, increase affordable housing, and create community gardens and composting facilities to reduce waste.

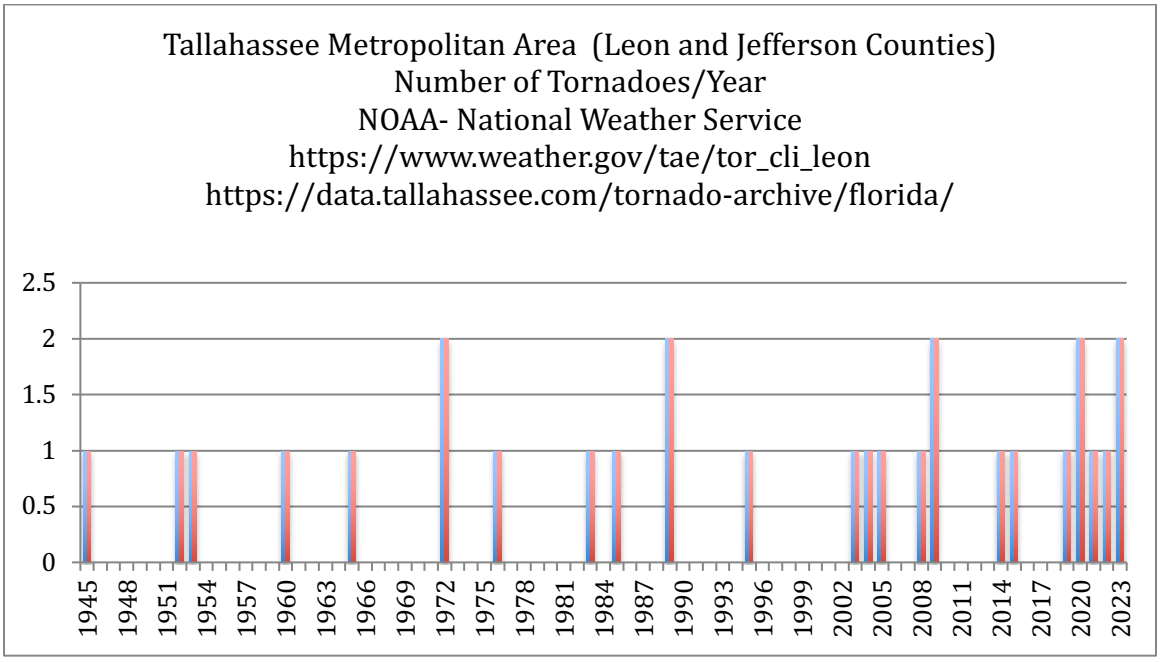
Jefferson County, FL – Challenges

The workshop in Jefferson County, FL took place on July 29th, 2022 in the City of Monticello, which is the seat of the county. Very few people attended the workshop despite interest expressed during prior outreach and being advertised a week before in the local newspaper.

Observed Increase of Tornadoes. North Florida experiences tornadoes each year, but they are generally weak and cause little structural damage (National Weather Service, n.d.); however, attendees to the workshop expressed their concern about the observed increase of the frequency of tornadoes hitting the area. Figure 17 shows the number of tornadoes that have hit the Tallahassee Metropolitan Area (Leon and Jefferson Counties) since 1945. The data was collected from the NOAA National Weather Service.

Figure 17. *Workshop Exercise Jefferson County, FL*

Figure 18. *Apparent Increase of Frequency of Tornadoes in Leon and Jefferson Counties, FL*



Hurricanes and Floods. Due to its proximity to the Gulf of Mexico, the county has been historically impacted by hurricanes. Some of the most recent hurricanes hitting the county directly were: Hurricane Kate in 1985, Hurricane Hermine in 2016, and Hurricane Michael in 2018.

Hurricanes produce strong winds that impact infrastructure and services such as the power supply and consequently the supply of potable water. Hurricane Michael left 90% of Metro Tallahassee without power for up to one week; Hurricane Hermine left 80% of the Metro Area without power for up to one week; Hurricane Kate left most of the people without power for five days, and others were without it up to three weeks (Florida State University, n.d.). Hurricanes also produce extremely heavy rain resulting in floods and flash floods in the low-lying parts in the county. During Hurricane Michael, the Jefferson County Sheriff's Office issued a mandatory evacuation for low-lying flood areas and mobile homes (Roberson, 2018).

The Aucilla River forms the eastern border of Jefferson County, separating it from Madison County on the north, and from Taylor County on the south. In March of 2022, heavy rainfall in the area drained into the Aucilla River, raising its water level to the highest point in 34 years (Young, March 29, 2022).

A few weeks before the workshop, FEMA was seeking feedback from Jefferson County citizens related to updates of the Aucilla River flood risk map. The last update was in 2016. Citizens were told that the meeting was critical and were urged to attend (Aleman, July 22, 2022).

Jefferson County, FL – Assets

Participants to the workshop identified the proximity of Jefferson County to Tallahassee as a very important asset. Being the capital of the state, Tallahassee possesses the financial and political resources that can benefit the county because of its proximity. Jefferson County is part of the Tallahassee Metropolitan Area and many of the residents in Monticello commute to Tallahassee to work. In fact, some of the attendees to the workshop in Monticello were residents of Tallahassee. In 2022, the Florida Department of Transportation approved funding for commuter buses between Monticello and Tallahassee (Blake, 2022).

Another important asset identified by the participants were the proximity to academic and research institutions in Tallahassee such as Florida A&M University, Tallahassee Community College, and Florida State University, which houses The Florida Climate Center Office in the Center for Ocean-Atmospheric Prediction Studies (Florida Climate Center, n.d.).

Results Video-Interviews

The Team performed video-interviews of some of the participants in the Workshops. The participation was voluntary and participants were requested to complete the Consent of Participation (see Appendix D). The questions were based on the Anonymous Survey (see Appendix B). The Team published the video-interviews on the following sites:

- YouTube: https://www.youtube.com/watch?v=U3PrPQTiaes&t=174s
- SCEN Website: https://www.scen-us.org/capturinglocalknowledge

Transcripts of the video-interviews are listed in Appendix E. The first question was about any observed impacts of climate change in the communities.

Warren Tidwell, an Organizer and Activist in Alabama, stated that "climate change in the south to me is sadly watching people get trapped in cycles of recovery from disasters because we are disproportionately affected by them here". Rev Michael Malcom with The People's Justice Council, a faith-based group based in Birmingham, AL, that operates "at the intersectionality of justice through interdisciplinary methods" (The People's Justice Council, n.d., parg.1), mentioned that climate change in the South represents a disturbance in the South's way of culture. For example, in Alabama, people are always worried about the next tornado and are "called to go downstairs and hide in your basement because the storms have gotten worse and worse and worse".

Kyle Crider, founder and member of the steering committee of Alabama Interfaith Power and Light (n.d) and member of The People's Justice Council, indicated that in "the Bible Belt", people put "things in biblical terms… the bible tells me that as we sow, so shall we reap. We are sowing gigatons, that is billions of tons of a known heat trapping gas every year and we can't expect God to absolve us of that blame. We are reaping what we sow in extreme weather and in people hurting".

Tai Robinson, a community member in Fort Valley, GA, states that 'we get a lot more hot days and we have earlier summers or earlier 90 degrees days. I noticed that our plants here, like our peaches they'll start to bloom in March or April instead of May or June". When she was asked why this was happening, she replied that "climate change and human interaction with climate change". When asked how it is affecting the community,

Ms. Tai replied that “In the community that I see, it affects mostly brown and black people’.

Elise Tolbert, community member in Tuskegee, AL, indicated that “climate change in the south is, I think it’s a mystical force that is impacting and influencing how we live life without our acknowledgement of it. In real life climate change is an inequity exacerbator”.

Ms. Lennora, a community member in Tuskegee, AL, stated “the number one thing that surprised me is that there are actual people like me who are actually here doing the work. So that was very surprising because many times we really feel alone.”

Rev Michael Malcom with People's Justice Council, stated “Today we heard people in the community and how they suffer and it’s high time that we start looking at and focusing on how our communities suffer.”

Ms. Tai Robinson in Fort Valley, indicated that “it is a huge job to try to save the world, and make it so our children's children have a world to go to but it is doable if we do it as a collective.” Rev Michael Malcom, with People's Justice Council, stated that “When we looked around the room today, we saw young people and for me that gives me hope.” Kyle Crider, with Alabama Interfaith Power and Light and The People’s Justice Council, stated that “while we are late getting started and we are barely getting started, as late as the hour is, it is not too late.”

Discussion and Conclusion

Process of Engagement

The process of engagement consisted of contacting via phone and email potential partners from the following groups (1) local-governments, (2) local higher-education institutions; (3) local non-profits (e.g., environmental and religious institutions); and (3) local organizations representing for-profit groups (e.g., chambers of commerce). Those who responded to The Team's request were selected as collaborators and potential partners for future research and are listed in Appendix A.

Universities became the principal partners and served as a link to community members. Some universities have strong ties with the local government, which is extremely important. For example, faculty in Fort Valley State University works closely with the city's emergency team; however, some attendees to the workshops indicated that local universities are too isolated and must get more involved with the local community.

How to Improve Engagement and Develop New Partnerships

Based on the generalized mistrust to federal entities by members of the community detected during this research, it is necessary to work through a local leader with experience working with that specific community. This local leader should be a credible person who is trusted by city officials, businesses, community members, and by the local academic institution. This local leader should be compensated and work in advance with the researchers and/or federal entities in order to organize any type of event or research.

Several participants in this research indicated that people have "other priorities" than climate change. As such, it is recommended to organize climate change events in

conjunction with other events important for the community. Based on the two most important concerns that the participants expressed related to the impacts of climate change, economic impacts and public health impacts, it is recommended to organize climate change research and/or events in conjunction with events related to economic or public health activities. For example, The Team was more successful in reaching out to people during the Peach Festival in Fort Valley, GA, than using other strategies.

Participants also mentioned that climate change is "overwhelming" and "convoluted." As such, it is recommended to work with the local leader to "translate" scientific jargon into less technical terms and related to the community's interest.

Key Findings

The results of the anonymous survey indicated that half of the population thinks that climate change is happening and affecting their communities. The same percentage believes that climate change is caused naturally and by humans (both). Less than 10 percent indicated that climate change is happening exclusively by human activities. Almost the same percentage (10%) indicated that climate change is not happening. More than one-half of the population indicated that climate change should be addressed by institutions and by individuals (both). This number was much higher for the population very interested in climate change, which attended the workshops. A large percentage of the population (more than 80%) doesn't think – or doesn't know – that officials are doing enough to address climate change. Only 10% indicated that officials are doing something to address climate change. More than 60% of the population indicated that scientists should be trusted but just one-third thinks that scientists agree about climate change, one-third think that scientists don't agree.

Climate Change Impacts, Challenges, and Adaptation Needs

Although the communities selected are located relatively in the same geographical area, the impacts of climate changes on these communities and the adaptation needs vary because of the different exposures and vulnerabilities that are influenced by socio-economic and historical conditions (IPCC, 2019).

Peach County, GA. The increase of rain and floods in Peach County, GA, the existence of the Superfund site in Fort Valley (EPA, 2023), and the runoffs from chemicals and organic waste from chicken farms make the area extremely vulnerable. The existing public health issues in the county, including mental health, can be exacerbated by an increase in temperatures. This increase of temperatures is also affecting the production of peaches and other agriculture products with devastating repercussions for the local economy and exacerbating the food deserts in the region. This increase of temperatures and the existing energy burden in the region have devastating consequences in the local public health, specifically on vulnerable populations.

Macon County, AL. In Macon County, AL, the community is being affected by an increase of the frequency and intensity of tornadoes, which have caused interruptions of power, stormwater damage-erosion, and roof damages. The increase of the frequency of rain and tropical storms are producing floods, and heat is producing wildfires and bad air quality, all affecting public health. Intensive rain and floods can worsen the existing contamination of *The Coosa River* and the *Mobile River,* which are contaminated with coal ash and chicken feces from industrial poultry farms. The extensive number of mobile homes in Alabama makes these communities extremely vulnerable to natural disasters, specifically tornadoes.

Jefferson County, FL. The region is experiencing an increase in the number of tornadoes, although their intensity is generally weak. Winds and floods from hurricanes are affecting the area, specifically in the supply of energy and potable water. The Aucilla River, which is experiencing record rising water levels, is forcing the community to redraw their FEMA flood maps.

Potential Paths for Adaptation and Opportunities

Each one of the three communities studied has the opportunity to leverage their own assets to develop a sustainable path for adaptation. Common assets in the three counties include farmers, businesses, local governments, and their proximity to universities.

For Peach County, GA specifically, the Superfund site in Fort Valley is a liability but it can also be an asset. Peach County can take advantage of the EPA Superfund program to educate and raise awareness in the community about the risks and vulnerabilities of the site to climate change, and to illustrate how climate adaptation can be integrated into Superfund cleanups as well as in the development of climate vulnerability assessments and climate adaptation plans.

The proximity to higher education institutions is a very important asset for the three communities. The Fort Valley State University's Emergency Management Office can work with the local government, the EPA, and the community in general to leverage the Superfund program to include climate education and adaptation programs. Tuskegee University in Macon County can expand their Water Quality Program from testing groundwater to testing the quality of water in all rivers and river basins in the county.

Jefferson County, FL, can leverage their proximity to Florida State University and the Florida Climate Center Office to educate and develop climate adaptation plans.

Resilience Hubs. A *Resilience Hub* is defined as community-serving facilities augmented to support residents and coordinate resources distribution and services before, during, or after a natural hazard event (USDN, n.d.). Resilience hubs are trusted, established, and community-managed facilities, and are used year-around as a neighborhood center. These facilities can improve the effectiveness and reduce burden on local emergency response teams and health facilities by enhancing community cohesion and participation, and provide community empowerment and leadership.

The *Boyle Heights Arts Conservatory* is an example of a Resilience Hub. Located in the heart of Los Angeles, this center provides to community members living in this neighborhood a safe and trusted space for people to access information, supplies, services, and resources before, during, and after a disruption. Some of the services provided are job training, community recovery preparedness, youth programming in arts, and senior services among others. The site became a refuge where community members know to come during extreme weather events and other disruptions (UNFCCC, 2022).

Tuskegee University is working on the possibility of becoming a Resilience Hub. Fort Valley State University would also be an ideal candidate to become a Resilience Hub because of its proximity to downtown Fort Valley in Peach County, GA. The Jefferson County R.J. Bailar Public Library in Monticello, FL, considered one of the best public libraries in the country, has been serving the information needs of the people in Monticello and Jefferson County for more than 110 years (bestpubliclibraries.com, n.d.). The library serves also as a community center and provides access to social services

(Jefferson County Public Library, n.d.). As such, this library would be an ideal location for the creation of a Resilience Hub for Jefferson County, FL.

Difficulties and Limitations of the Research

The biggest limitation of this study was the insufficient sample size for statistical measurements. This limitation was caused by the increase of cases of COVID during the first semester of 2022. Another limitation was selecting the appropriate time of the year to collect the data and implement the workshop. Several stakeholders recommended that the best time for the research was during the harvesting season as more people were attending events at the urban center, which for peaches is from June through late July. This timing unfortunately coincided with the summer break at universities, which prevented many university collaborators from attending the workshops.

Next Steps (Objective #6 and Objective #7)

The Team will disseminate the information collected in this study, including this Whitepaper, a Power Point Presentation with the results, and links to the videos to the three communities via partners and collaborators. The Team also plans to open a virtual channel in which members of the community can communicate and provide feedback and ideas to improve potential future studies.

Recommendations and Follow-Up Studies

The Team recommends a follow-up study to address the limitations of this study and to leverage the participation of stakeholders who were engaged. This new study shall:

- Expand engagement and include more stakeholders, including emergency and preparedness local officials, public health officials, and representatives from the local universities, among others.
- Educate and train stakeholders in the financing and development of Resilience Hubs.
- Collaborate with stakeholders in development of the Resilience Hubs.

Conclusion

The communities involved in this study (i.e., Peach County, GA, Macon County, AL, and Jefferson County, FL) are considerably affected by the impacts of climate change including the increase of temperature, rains and consequently floods, and tornadoes. These communities are also more vulnerable to climate change impacts because of the numerous environmental injustices caused by socio-economic and historical conditions. For example, the Superfund site and the public health conditions in Peach County, or the pollution of rivers in Alabama, exacerbate climate change impacts in these counties.

This study was the first step to ameliorate a generalized lack of trust in federal agencies caused by persistent environmental injustices in the region and the lack of local collaborative efforts to prepare these communities for present and future climate change impacts. This study identified opportunities to leverage local assets such as farmers, local officials, business, community partners, and proximity to higher education institutions for the creation of Resilience Hubs as an effective mechanism to educate, prepare, and adapt these communities to the impacts of climate change.

The following links provide more information about this research through video-interviews with researchers and participants:

YouTube:

https://www.youtube.com/watch?v=U3PrPQTiaes&t=174s

SCEN Website:

https://www.scen-us.org/capturinglocalknowledge

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Appendix A: List of Collaborators/Potential Partners

Organization	Partners/Collaborators	Organization
Macon County, AL	Amy Strickland	Auburn Sustainability
	Dr. Walter Hill	Tuskegee University
	Dr. Ramble Ankumah	Tuskegee University
	Dr. Conrad Bonsi	Tuskegee University
	Dr. Channa Prakash	Tuskegee University
	Kara Woods	Hometown Organizing Project
Peach County, GA	Dr. Brou Kouakou	Fort Valley State University
	Bobby Cowart	Interim Director, Peach County Public Works Department
	Roscoe Miller	Interim P&Z Director
	Jann Culpepper	ED of Keep Peach County Clean and Beautiful
	Bipul K. Biswas, Ph.D.	Fort Valley State University
	Curtus Borne, Ph.D	Fort Valley State University
	Nalini Pattanaik	Fort Valley State University
	Meigan M. Fields, Ph.D.	Fort Valley State University
	Jeff Cook	Peach County Extension Agent
Jefferson County, FL	Emily Powell	Florida State University - Florida Climate Center
	Dr. Robert Taylor	Florida A&M University
	Lashonda Cloud	Florida A&M University
	Dr. Valencia Matthews	Florida A&M University
	Annette Washington	Florida A&M University
	Dr. Wendy- Lin Bartels	University of Florida
	Dr. David Zierden	Tri-State Row Crop Working Group
	Dr. Emily Powell	Tri-State Row Crop Working Group
	Shannon Metty	Jefferson County Florida Planning Department
	Jeff Hendry	North Florida Economic Development Partnership
	Diane Scholz	North Florida Economic Development Partnership
NOAA	Ariela Zycherman	NOAA - Climate Adaptation Partnerships Program (formerly RISA)
	Sean C Bath	Climate Adaptation Partnerships Program Manager

* Main Collaborators in yellow

Appendix B: Anonymous Survey and CCMRP Mapping

This Appendix shows the Anonymous Survey used to address Objective #3, which required to perform an Anonymous Survey to community members to collect data about their perceptions related to climate change and climate change adaptation. In order to meet this objective, The Team developed a survey based on the Climate Change Risk Perception Model (CCRPM) (Linden, 2014). The goal of CCRPM was to combine and integrate cognitive, experiential, and socio-cultural factors to collect climate change risk perceptions. The framework of the model is summarized in Figure 8.

Regional Integrated Sciences and Assessments (RISA) Program
Collaborative Planning Activities for the Southeast and US Caribbean
Southeast Climate and Energy Network (SCEN)
Capturing Local Knowledge in the Southeastern United States

Questionnaire

* Mapping to the CCRPM model in yellow

1. Are more extreme weather events or other climate environmental changes affecting your community?
   CCRPM: Experimental Process – Personal experience
   (a) No, they are not affecting my community
   (b) Yes, they are affecting my community
   (c) I don't know if they are affecting my community

2. More extreme weather events and other climate environmental changes are: CCRPM: Cognitive Dimension – Natural cause - knowledge
   (a) Natural-caused
   (b) Human-caused
   (c) both of the above
   (d) None of the above - the changes are not happening

3. Are your city officials doing something to address more extreme weather events and other climate environmental changes?
   CCRPM: Cognitive Dimension – Response - knowledge

(a) No
(b) Yes
(c) I don't know

4. Do the scientists agree about why or if more extreme weather events and other climate environmental changes are happening?
CCRPM: Cognitive dimensions – Scientific consensus - knowledge
(a) Yes
(b) No
(c) I don't know if they agree

5. Select the answer that describes you:
CCRPM: Experiential Process – Emotions and Affect Heuristic
(a) I have a strong feeling that more extreme weather events and other climate environmental changes are happening but I don't have any real experience
(b) I have a personal experience related to more extreme weather events and other climate environmental changes
(c) None of the above

(Continue - see other page)

6. Who should address more extreme weather events and other climate environmental changes?
CCRPM: Socio-cultural influences – Descriptive/prescriptive norms
(a) Others (ex., politicians, government agencies, etc.) should take action to address climate change
(b) I should take action
(c) both of the above
(d) None of the above

7. Why should more extreme weather events and other climate environmental changes be addressed?
CCRPM: Socio-cultural influences – Value Orientations (egoistic/social-altruistic/biospheric

(a) because they are affecting me and my family or can affect me or my family
(b) because they are impacting my community
(b) because they are affecting many people around the world
(c) because they are affecting animals and plants
(d) All of the above
(e) None of the above

8. Who do you trust most for information about more extreme weather events and other climate environmental changes?
CCRPM: Trust
(a) Scientists

(b) Media (tv, radio and newspapers – online or offline) or social media that publish climate change news
(c) Media (tv, radio and newspapers – online or offline) or social media that explains that climate change is not real
(d) Family and friends
(e) Political leaders

9. Tell us more about yourself
CCRPM: Socio-demographics

(a) Sex
(b) How would you describe yourself (ex., liberal, conservative, etc.)?
(c) Race(s)

End Questionnaire

Appendix C: The Workshop

AGENDA	
Sign-In, Coffee, Networking	**8:45 – 9:00**
Introduction, Overview & Pre-Assessment	**9:00 – 9:10**
SESSION 1 (Part 1): Local Information Exercise Activity: Worksheet #1 In order to collect information on local impacts and concerns community teams will work together to answer the following questions: What changes are you seeing? Why do you think it's happening? How is it effecting you or your community? What if it continues for the next 10 years? Methodology: Knowledge Exchange Approach: Participants will receive worksheets with the above questions and write answers working in teams of 3-4 people. Teams will identify their community but will otherwise remain anonymous. All teams will then verbally report back to their larger communities to discuss results and record on wall notes. Researchers will collect the worksheets after this session and use the results to identify future scenarios for Workshop Session 3 as well as inform potential research questions.	**9:10 – 10:00**
SESSION 1 (Part 2): Climate/Extreme Weather Overview Presentation & Discussion: Using NOAA and other data, this session will set the stage for a better audience understanding of future climate impacts nationally, regionally and locally. Downscaled projections will be included. The presentation will be followed by open discussion, questions and answers. Methodology: Knowledge Exchange Approach: Participants will receive information from federal, state and local agency reports and data on climate change and future impacts. Open discussion will be encouraged following the presentation and wall notes will be taken by staff and used to inform the white paper and research questions. Statements made during the open session will not be attributed to any individual.	**10:00 – 10:45**
BREAK	**10:45 – 11:00**
SESSION 2: Identifying Assets: Team Work & Sharing Presentation and Activity: Worksheets #2 & #3 In this exercise, participants will explore their own community assets and work together in small teams to identify those resources that are critical to community resiliency. Assets can be anything the communities deem	**11:00 – 12:00**

important to its resilience. That includes culture, traditional knowledge, landscapes and environmental resources. Participants should also consider, what buildings and agencies or departments are critical and what maintains or builds economic sovereignty, helps educate youth and protects elders. Community members will then work together to rank the assets in order of importance and identify the criteria they used to assign their rank. Methodology: Knowledge Exchange & Asset Vulnerability Framework Approach: A short presentation will be provided to engage participants on the types of assets they should consider and how they might prioritize. Participants will receive 2 worksheets and then work in teams of 3-4 people to identify and write down a list of critical assets for their community. They will then prioritize those assets based on their own criteria. All teams will then verbally report back to their larger communities to discuss results and record the top priorities on wall notes. Communities will then be asked to vote on their top 5-10 assets using dot-voting. Researchers will record the top 5-10 assets and will apply them to the scenario exercise in Session 3.	
LUNCH	**12:00 – 12:30**
SESSION 3: Defining Future Vulnerabilities & Resilience Presentation and Activity: Researchers will provide a short presentation to provide guidance on building a scenario grid before participants begin the exercise. Using a future scenario grid, community members will identify critical asset vulnerabilities, concerns, other needs and resilience under different future climate scenarios synthesized from Sessions 1 and 2. Methodology: Knowledge Exchange, Exploratory Scenarios & Framework for Participatory Impact Assessment Approach: A short presentation will be provided to engage participants on the types of assets they should consider and how they might prioritize. Participants will receive worksheets and then work in teams of 3-4 people to identify and write down a list of critical assets for their community. They will then prioritize those assets based on their own criteria. All teams will then verbally report back to their larger communities to discuss results and record the top priorities on wall notes. Communities will then be asked to vote on their top 5-10 assets using dot-voting. Researchers will record the top 5-10 assets and will apply them to the scenario exercise in Session 3.	**12:30 – 1:45**
SESSION 4: Co-creating Future Research Questions Activity: Sample Scenario Grid Community members and the Team will work together to draft research questions derived from the vulnerabilities, concerns and other needs identified in Session 4.	**1:45 – 2:45**

Methodology: Knowledge Exchange Approach: Participants, working with researchers, will use the grid in Session 3 to assess and identify uncertainties and vulnerabilities that can be addressed through future research.	
Next Steps and Post-Assessment	**2:45 – 3:00**

Worksheet #1: Local Information Exercise

What changes are you seeing?	Why do you think it's happening?	How is it effecting you and/or the community?	What if it continues for next 10 years?

Source: Susan A Crate, PhD, Professor of Anthropology in the Department of Environmental Science and Policy at George Mason University

Worksheet #2: Identifying Community Assets

Community: _____

Write down a list of assets or community resources you consider to be important to your community. This would include assets specific to your own life as well as overall community assets including political/governance, social/cultural, environmental, economic, technological, infrastructure etc.

Community Assets

Worksheet #3: Asset Prioritization and Criteria

Now rank the assets above in terms of their importance to you and the community: highest level of importance, medium level of importance, low level of importance. What criteria did you use to rank your assets (e.g., cultural significance, economic significance, food security, etc.)?

Asset Ranking	Criteria
Highest Level of Importance	
Medium Level of Importance	
Lowest Level of Importance	

Sample Scenario Grid

Exploratory Scenarios

2032	3 Months (Aug-Oct) of 95+ degree heat	Agricultural produce value declines 20%	Population declines by 30%	Winter is 2 months shorter; Summer is 2 months longer	State Prioritizes Solar Power
Community Youth					
Farms					
Hospital					
Small Business					
River					

Assets

Vulnerable or Resilient?

Appendix D: Consent of Participation

Regional Integrated Sciences and Assessments (RISA) Program
Collaborative Planning Activities for the Southeast and US Caribbean
Southeast Climate and Energy Network (SCEN)
Capturing Local Knowledge in the Southeastern United States

We are asking you to participate in this workshop/study titled "**Capturing Local Knowledge in the Southeastern United States**". This voluntary consent form describes this workshop/study to you and answer any of your questions. This workshop/study is being led by **Southeast Climate and Energy Network (SCEN)**. The **Advisor for this study is** Dr. Jairo Garcia, Chair of FRESH Energy Team at SCEN.

What the workshop/study is about
The purpose of this workshop/study is to identify and understand the impacts of extreme weather events and other climate environmental changes on your community, as well as to identify your local assets, challenges, and opportunities to address these issues.

What we will ask you to do
We will ask you to participate in a workshop on a Saturday from 9:00 am to 3:00 pm (snacks and lunch will be provided). The workshop will be very interactive. You will be asked to answer some questions related to extreme weather events and other climate environmental changes. Participation in audio or video recordings will be optional (see below). You are welcome to attend to the screening of a documentary the night before the workshop. The attendance to this screening is optional.

Risks and discomforts
We do not anticipate any risks from participating in this workshop/study.

Benefits
The direct benefits of participating in this workshop/study are numerous including an understanding of how to mitigate the impacts of extreme weather events and other climate environmental changes on your community, and how to engage to develop the best solutions for your local conditions and collective vision for the future. With assistance from the experienced team we have assembled, we will empower your community to devise proactive strategies for your specific needs. By localizing plans rather than relying on general approaches, your community will become more resilient and be able to thrive in the face of extreme weather events and other climate environmental changes. At the end of the workshop, you and your community will be aware of opportunities to address and finance mitigation and adaptation efforts.

Compensation for participation
There is not a compensation for participating in the workshop/study.

Audio/Video Recording
During the workshop/study, we would like to capture individual experiences as a mechanism to tell the stories of some of the attendees using video recordings. These video recordings will enrich the experience of the workshop by allowing participants to tell their stories in their own words. The videos will be kept by SCEN and published in our website. Your participation in these video recordings is optional without compensation. If you decide to participate in these video recordings, you will be required to sign an additional disclosure form.

Please sign below if you are willing to participate in these optional video interviews. You may still participate in the workshop/ study if you are not willing to have the interview recorded.

- ☐ I do not want to have this interview recorded.
- ☐ I am willing to have this interview recorded:

Signed: _____
Date: _____

Privacy/Confidentiality/Data Security
All the information collected during the workshop/study (surveys and interviews) will be anonymous. As such, all the data collected will be de-identified (except for the signed consent forms, which will stay separated)

Sharing De-identified Data Collected in this Research

De-identified data from this workshop/study may be shared with the research community at large to advance science and health. We will remove nor code any personal information that could identify you before files are shared with other researchers to ensure that, by current scientific standards and known methods, no one will be able to identify you from the information we share. Despite these measures, we cannot guarantee anonymity of your personal data.

Taking part is voluntary
The participant's involvement is this workshop is voluntary. You may refuse to participate before the study begins, discontinue at any time, or skip any questions/procedures that may make you feel uncomfortable.

Follow up studies
May we contact you again to request your participation in a follow up study? Yes/No

If you have questions
The main researcher conducting this study is Dr. Jairo Garcia with the Southeast Climate and Energy Network. Please ask any questions you have now. If you have questions later, you may contact Dr. Jairo Garcia at jairohgarcia@urbanclimatenexus.com or at 404-210-7575.

Statement of Consent Signing this consent is optional since this is a minimal risk social and behavioral research. Furthermore, we will not use this form for the research since your participation is anonymous

I have read the above information, and have received answers to any questions I asked. I consent to take part in the workshop/study.

Your Signature_____ Date_____

Your printed name _____

Signature of person obtaining consent_____ Date_____

Printed name of person obtaining consent_____

- - -

Appendix E: Video-Interviews

The Team performed video-interviews to some members of the three Subject communities. The video-interviews were published and can be watched at the following links:

YouTube:

https://www.youtube.com/watch?v=U3PrPQTiaes&t=174s

SCEN Website:

https://www.scen-us.org/capturinglocalknowledge

SCRIPT

We're doing an event tomorrow at the university, in which building is it Abigail? The child development center at Fort Valley State University, we're going to do a little presentation on extreme weather events and get feedback from y'all. Alright about your situation here in Fort Valley, we're trying to work in more rural communities in the South

VO (Voice Over)

"In 2021 and 2022, the Southeast Climate and Energy Network, along with Environmental Finance Center West, Urban Climate Nexus, Hometown Action, and Exposure Labs, were accepted into the NOAA Climate Adaptation Partnerships to host gatherings in communities in the US south with the hope of gaining an understanding of how they're experiencing climate change and their needs around it."

(Abigail Franks - Southeast Climate & Energy Network)

There's a distinction between what the data says and what the reality is and so you can only know the reality if you ground truth yourself and that can only be done working with the community

(Dr. Jairo Garcia - Urban Climate Nexus)

Something we need to learn is how climate change is affecting the communities, how climate change is affecting the lives of these people.

(Dr .Kenya Goodson)

I think it's important for community members to be able to tell their own stories about what 's happening in their own backyards, us as researchers can work in collaboration with these communities because they need to be on the forefront of the solutions that we are determining for these areas.

(Sarah Diefendorf - Environmental Finance Center West)

Because this is where the community is, and community especially rural communities are always overlooked or they are planned for at the national level or the state level but you never get the real community input and they know what happening, they know what's wrong and they frequently have the answers in part on how to fix it.

(Kathleen Kirkpatrick - Formerly Hometown Action)

We can look at data from afar, we can look at maps, and information that we gleen even through online research but until we get on the ground and in the community and hear from the people who actually live and work here, we don't get the full story.

(Elaine McCarty - Environmental Finance Center West)

It's just important that the participants in the workshops who are community members had every chance to co-develop and co create that with us

VO

"In the fight for climate justice, community is everything. Leaning on each other to share knowledge and experience is an invaluable part of being human, yet that shared knowledge and wisdom have long been written off in the wider search for solutions. Community and collaboration are engrained in Southern culture, which is just one of the reasons we chose to focus on the Southeastern US."

(Alexander Easdale - Southeast Climate & Energy Network)

The south is misunderstood, it's very under-resourced, the Southeastern US is 86 million people and one of the most diverse regions in the world, also in terms of biodiversity and economic importance. If it was not a part of this country, it'd be the fifth largest economy in the world.

(Rev Dallas Conyers - Southeast Climate & Energy Network)

Protecting our biodiversity here is so important in upholding those fragile cycles that we all need to continue living comfortably. If we don't protect them, comfortable will not really be an option .

(Warren)

Climate change in the south to me is sadly watching people get trapped in cycles of recovery from disasters because we are disproportionately affected by them here.

(Rev Michael Malcom - People's Justice Council)

0:12-19 - So climate change in the South represents of disturbance in our entire way of culture

0:38-53 - Even in the state of Alabama, we are always worried about the next tornado, we are int tornado season right now and at any moment we may be called to go downstairs and hide in your basement bc the storms have gotten worse and worse and worse

(Kyle)

Here in the Bible belt, we're used to putting things in biblical terms so you'll hear a lot of folks here in the south that either climate change isn't happening or why worry about it, God's in control but that just means they need to go back and read their bible bc the bible tells me that as we sow, so shall we reap. We are sowing gigatons, that is billions of tons of a known heat trapping gas every year and we can't expect God to absolve us of that

blame. We are reaping what we sow in extreme weather and in extreme and in people hurting.

VO

"We conducted workshops in 3 rural towns in Georgia, Alabama, and Florida, asking community members to come and share their stories and knowledge of climate change in their own backyard. Our goal was to achieve an understanding of how each community was feeling and experiencing the impacts of climate change, what assets already existed in their community and potential solutions so that we could take that back to NOAA at a government level and impact future planning around the solutions being crafted and decisions being made."

(Tai Robinson - Fort Valley, GA Community Member)

1:58-2:27 - I've seen that we get a lot more hot days and we have earlier summers or earlier 90 degree days. I noticed that our plants here, like our peaches they'll start to bloom in March or April instead of May or June

3:22-34 - (Alexander Easdale - Southeast Climate & Energy Network) - so why do you think this is happening?

(Tai) Climate change and human interaction with climate change

3:34-4:12 - (Tai Robinson - Fort Valley, GA Community Member) When I think about how hot it gets so early, I think of emissions. When I think of peaches and farming not doing too well, bc of the climate, I think of one crop industrial farms instead of coop grows where you grow different variety of plants because that natural biodiversity stops

flooding, it keeps the plants cool, and it helps keep water in the soil and nutrients in the soil. If we're only growing one crop at a time, we tend to lose all biodiversity throughout the soil and if you spray pesticides on top of that…done.

6:35-51 - (Alexander Easdale - Southeast Climate & Energy Network) All these changes, the last 5-10 years, how is it affecting the community and who in particular do you think its affecting the most?

(Tai) In the community that I see, it affects mostly brown and black people

(Elise Tulbert - Tuskegee, AL Community Member)

Climate change in the south is I think it's a mystical force that is impacting and influencing how we live life without our acknowledgement if it. In real life climate change is an inequity exacerbator.

When you feel like you're at it alone or have shared values with people around you, it makes it harder to sustain hope and in fighting for the climate and fighting for the planet but when you realize that you're not in it by yourself and the perspectives of people around you are so crucial to add to your own and you can all work together with shared knowledge to get thing done, it's like Yeah We got this

(Lennora)

2:33-43 - The number one thing that surprised me is that there are actual people like me who are actually here doing the work. So that was very surprising because many times we really feel alone. Having organizations like yourselves to come to our community to

show that you actually care about what it is that we're doing for the planet really gives me hope.

(Rev Michael Malcom - People's Justice Council)

We oftentimes try to chase and save the cosmos then we forget all about community. Today we heard people in the community and how they suffer and it's high time that we start looking at and focusing on how our communities suffer. As I say always, you help the people, you heal the planet.

VO

"NOAA CAP approach of resourcing organizers and scientists to go out into communities and obtain feedback that is then shared with decision makers who, at times, hold our future in their hands is a way to shift power back to the people. We feel honored to have played a role in this work and hope it can be grown and replicated in future planning."

(Tai Robinson - Fort Valley, GA Community Member)

It is a huge job to try to save the world, and make it so our children's children have a world to go to but it is doable if we do it as a collective

(Rev Michael Malcom - People's Justice Council)

When we looked around the room today, we saw young people and for me that gives me hope.

(Kyle)

While we are late getting started and we are barely getting started, as late as the hour is, it is not too late.

(Abigail)

The culture is here already for collaboration, and also I'll say it, we're resourceful and we also know how to have a good time while do it. We know how to have fun out of really serious situations.

Appendix F: Scenario Grid - Macon County, AL

Scenarios -> Assets:	**Mosquito born pandemic emerges in SE U.S. -25% mortality rate results**	**Category 2 hurricane stalls over Macon County for 5 days-drops 50" rain. I-85 washed out**	**Tuskegee has 105F for one month**	**Tuskegee University spearheads marijuana/hemp innovations. Macon County becomes of SE**	**Tuskegee announces funded land trust and pilots design and construction of affordable, resilience housing**
Agriculture	● More awareness ● Not enough workers to support ag businesses; creates food storage ● Creates local market for greater variety of crops (biodiversity) ● Could be treated like syphilis, university could find a cure	● Crops are washed out causing food shortage and lack of transportation in food system ● Crops dying; loss of jobs for many locals; farm animals barely surviving ● Floods destroy crops and animals, devastates local economy	● Crops destroyed or damaged-negative economic impact ● Damage the ground; drought ● Crops and animals die, creates shortages	● Boosts local economy, people want to work here ● Economic boom in the community (job growth) ● Brings job and need for harvest, containment, and processing	● Ag economy diversifies to support increased population ● Community garden. Composting aligns with zero waste
University	● Research for vaccine/treatment ● Mental health crisis ● Leads research to disease control. Has focus group for black population	● Historical buildings are destroyed along with archives ● T.U. has to close because not access-staff, faculty, students stranded ● Maximum floods and damage to infrastructure	● Campus has to shut down, no classes or research ● Utility rate cause university to shut down for a period of time	● Increased money and programs at TU, boost to economy ● Negative impact ● TU SMART partnership incubator grown on TU	● Better quality of life. More positive traffic and influence into the community ● Increase the number of students the university. More exposure ● TU students stay local after graduation ● Partnership between TU architecture, local construction to rebuild/build.
Internet	● More work and schooling done online ● Telemedicine used for diagnosis and treatment, reduces exposure	● Towers aren't accessible and communication ceases. Causes more devastation because people can't be reached ● Internet access keeps stranded people in contact with outside (but only if power is available)	● Communication grid literally melts or burns up ● People are staying inside so internet is used a lot more and is beneficial	● Tech transfer for rapidly developing technology ● Internet is used to ensure health of hemp plants. Binding tech with ag. ● Broadband supports remote workers, more people move to the area	
Zero Waste	● Reduced population reduces stress on infrastructure for waste management	● Collect and recycle water ● Flooding creates high volume of toxic leachate at existing landfills; impacts water quality and health	● Solar powered buildings and businesses have better performance	● Hemp/marijuana diverse crop also spurs new materials with little waste (not extractive) ● Hemp products can	● Local businesses start up to support new green building materials ● Community is built with smart tech in mind. Zero waste initiative in community

				replace paper products. Hemp products can be recycled 7-8X vs the 3 times that paper can. ● Planting uses zero waste	
Health/Hospitals	● Lack of hospitals makes death rate increase 25% in this area ● Overwhelmed by pandemic and not enough workers ● Community crisis especially for services	● Overflow of people or pop-up hospitals	● Local health facilities overburdened by people who get sick from heat ● With a temperature that high, AC units go out due to overproducing ● High temperatures can cause heat strokes and harsh breathing conditions ● Overfilled hospitals! ● Deaths related to heat-> need for cooling stations/limit hours in sunlight	● More jobs for the community. Can benefit a lot of people with medical needs ● Innovative health treatments use local products. ● Hemp products could be created to combat ailing health problems in community ● Tourism/business open for hemp	● Better quality of life for residents ● Lack of hospital is reason housing is not filled to max population
How/why are you resilient? How/why are you not resilient?	**NO** ● Lack of facilities and health care staff, lack of ambulance service **YES** ● University makes public health resilient ● Telemedicine ● Mental health support ● Leadership at university responds to crisis ● University continues activities ● Internet allowed jobs/schooling, medical care/church during pandemic ● Less stress on waste system	**NO** ● Without federal response funding, agriculture is devasted ● University would fail, would bounce back but would take time ● Lack of internet-> no communications ● Road/bridges out-> cut off ● Vulnerable to toxic contamination with flooding ● Lack of medical facilities/staff; increase need ● Difficult with transportation shortage to reach medical facilities **YES** ● Pop up hospitals would improve resilience	**NO** ● Internet collapses ● Without federal response funding, agriculture is devasted ● University would fail, would bounce back but would take time ● Majority of population and vulnerable people will not have adequate cooling ● Medication that requires refrigeration goes bad **YES** ● Those with renewable	**NO** ● Community can't absorb population increase. People would move to neighboring Auburn communities-lose potential tax benefit ● Could create image for university **YES** ● Possible economic gains but negative outweighs the positive ● Tech makes resilience in ag techniques and responds quickly ● New hemp products	**NO** ● Not prepared for increased enrollment (classroom size and faculty/staff) ● If medical care needs are not met, people still won't move here even with economic/housing benefits **YES** ● Increased local/diverse ag production ● Community garden/composting ● Increased student enrollment ● Ag school offers through leadership in this ● More local jobs in construction

			energy will prevail	create materials, improves local supply chain/markets ● Marijuana could provide health benefits	● People can move here and work remote ● New innovative businesses make community more resilient ● Green construction and living reduces waste burden. Land trust elevates standard.