

# Georgetown RISE

**Resilience, Innovation, Sustainability, Education**

P.O. Box 1630 ▪ Georgetown, South Carolina 29442

Telephone: 843-904-9034 ▪ Email: msnyder@baruch.sc.edu



## Georgetown Climate Adaptation Project Briefing Document June 25, 2019

---

*Georgetown RISE is pleased to present outcomes and findings from a NOAA Scientific Transfer Grant Project. This document summarizes the project approach, partnerships, survey results, outputs and outcomes, as well as recommendations for next steps.*

**Project Title:** From NECAP to GCAP: Transferring Climate Adaptation Knowledge and Tools from New England to Georgetown, SC

**Project Summary:** The Georgetown Climate Adaptation Project (GCAP) worked with partners from the New England Climate Adaptation Project (NECAP) to localize consensus based decision-making simulations to address the coastal flooding issues in Georgetown, South Carolina. Role Play Simulations are case study role playing exercises based on extensive local interviews, stakeholder assessments, and downscaled climate data. The GCAP team includes the Consensus Building Institute (CBI) that developed the New England case studies; the Carolinas Integrated Sciences and Assessment (CISA) program headquartered at University of South Carolina that produced county- specific, downscaled climate projections; the North Inlet-Winyah Bay National Estuarine Research Reserve (NERR); and Coastal Carolina University (CCU). The project team provided local end-user and community engagement, hosted a train-the-trainer workshop for education and stakeholder partners on how to effectively utilize local simulations, and implemented the Role Play Simulation through community workshops in Georgetown County. Over 200 participants (not including a pilot group of about 30 stakeholders), from a wide range of backgrounds and affiliations, engaged in this project through workshops and trainings. Results from community workshops were also presented at the National Adaptation Forum conference and the United Nations Regional Centres of Expertise on Sustainable Development Americas Conference. Outcomes of this project include accurate, localized climate data, survey results from participants, and recommendations for future action.



## **Project Narrative**

Over the past four years in Georgetown County, South Carolina, communities have endured one-thousand-year rainfalls, Hurricanes Matthew and Irma, alongside increasing frequency of high tide flooding. Most recently, Hurricane Florence and subsequent flooding brought new urgency and importance to climate adaptation planning efforts in the county. In each case, this coastal county has experienced threats to life, impacts to the ecosystem, infrastructure and housing damages, and lost business revenue and school days, among other issues. Leaders and residents of Georgetown County are acutely aware of the impacts from climate change on their communities and quality of life and natural resources (IPCC, 2014,2018). Yet, like many small counties and towns in the United States, they are challenged by financial limitations and burgeoning infrastructure needs that restrict their ability to focus on planning for climate adaptation and mitigation. The New England Climate Adaptation Project (NECAP) provided a useful model of stakeholder engagement, consensus building, and climate projections in community planning. However, initial feedback indicated that the issues, social/cultural dynamics, and political settings were too different to apply the same case studies. The Georgetown Climate Adaptation Project (GCAP) was a NOAA Science Transfer grant project to modify this approach for Georgetown County, SC.



## Role Play Simulations

Role-play simulations are effective tools for preparing and building capacity. Decision-makers can use simulations to practice incorporating climate change risks into short-term and long-term decision-making. By providing participants with realistic, but fictionalized scenarios in which difficult choices have to be made, simulations provide a useful roadmap of productive conversations around climate adaptation planning. Role play simulations provide decision-makers with a “safe” opportunity to experiment with collaborative decision-making and stakeholder engagement. This case study simulates the kinds of challenges and difficult trade-offs that decision makers may face in the near future as a result of climate change. The ways in which participants grappled with these decisions, the choices they ultimately made and the subsequent debriefs provide insight into community perceptions and attitudes about climate issues as well as demonstrating the importance of civic engagement.

Stakeholder interviews assessed the social, economic, and demographic perspectives that would be representative of a community decision making body. Role Play Simulation case studies were produced to model a stakeholder meeting on community planning for climate adaptation. Participants portrayed a role that differed from their own identity.



Complete Role Play Simulation materials and instructions available online:

<https://www.coastal.edu/georgetownrise/georgetownclimateadaptationproject/>

## **Downscaled Climate Projection Data**

Output description: Downscaled climate projections were produced by University of South Carolina research faculty within the Carolinas Integrated Sciences and Assessments program.

- Global Climate Models (GCMs) are too coarse to resolve a single county. Downscaling produced projections with finer spatial resolution to predict future climate conditions for Georgetown, SC
- Downscaled projections are at spatial scales relevant for local decision-making while preserving time-scales and patterns of meteorology as simulated by GCMs

## **How to use these projections**

The blue column includes real measurements that were taken between 1976 and 2005 and then averaged over that period. This is a reference of past climate conditions. Projections of climate variables are in the orange columns. The climate models used here assume humans will continue to use fossil fuels at the rate we are using them now, or even increase that usage (in the Role Play Simulation, participants are asked to consider planning decisions based on this scenario).

The projections include several climate variables including temperature, precipitation, storm frequency, and sea level rise. The variables are presented as **averages** and **extremes**, indicating gradual changes and acute impacts the county may experience. Both are important to consider in planning for emergency response, community resilience, and adaptation.

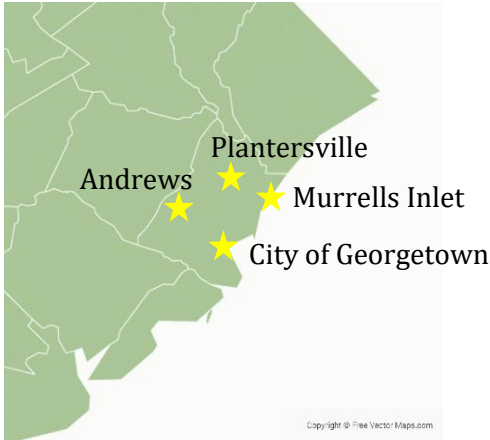
**The numbers in this table represent the best science available on possible changes to temperature, precipitation, storm events, and sea level rise in Georgetown County over the short term (to 2039), the medium term (2040 to 2069) and the long term (2070 to the end of the century).**

These components of climate interact with infrastructure, public health, agriculture, business, and many other sectors. The project team recommends that climate projections are considered in future decisions about planning and infrastructure. In particular, whether they have any bearing on comprehensive plan projects currently under consideration and how they are prioritized.

INDICATOR	HISTORICAL	PROJECTED		
	(1976-2005)	Short term (2010-2039)	Medium term (2040-2069)	Long term (2070-2099)
<b>Temperature (degrees Fahrenheit)</b>				
Average annual minimum	54.1	55.9	58.1	60.9
Average winter minimum	37.8	39.3	41.2	43.6
Average summer minimum	70.5	72.5	74.9	77.8
Average annual maximum	75.9	77.6	80.0	82.8
Average winter maximum	60.3	61.8	63.7	66.0
Average summer maximum	90.0	91.8	94.4	97.7
<b>Temperature Extreme (days per year)</b>				
colder than 28 °F (daily minimum)	19.6	14.7	10.1	5.6
hotter than 100 °F (daily maximum)	2.1	4.1	11.6	32.2
<b>Precipitation (inches)</b>				
Average annual precipitation	51.5	53.3	53.8	53.9
Average winter precipitation	10.8	11.0	11.5	11.6
Average summer precipitation	17.1	17.5	17.6	16.7
<b>Storms (events per year)</b>				
1" in 24 hours	10.4	11.3	11.6	12.1
2" in 48 hours	6.5	7.4	8.1	8.7
<b>Storms (events per decade)</b>				
4" in 48 hours	6.8	8.9	9.5	11.4
<b>Sea Level Rise (feet)</b>				
amount of increase over what the sea level was in the year 2000		between 1.9 and 2.13	between 3.58 and 4.3	between 8.66 and 10.6

## Community Workshops

Four community workshops were held throughout Georgetown County. Georgetown RISE partnered with trusted community ambassadors to host these workshops.



South Carolina with Counties - Single Color by FreeVectorMaps.com



## Demographics

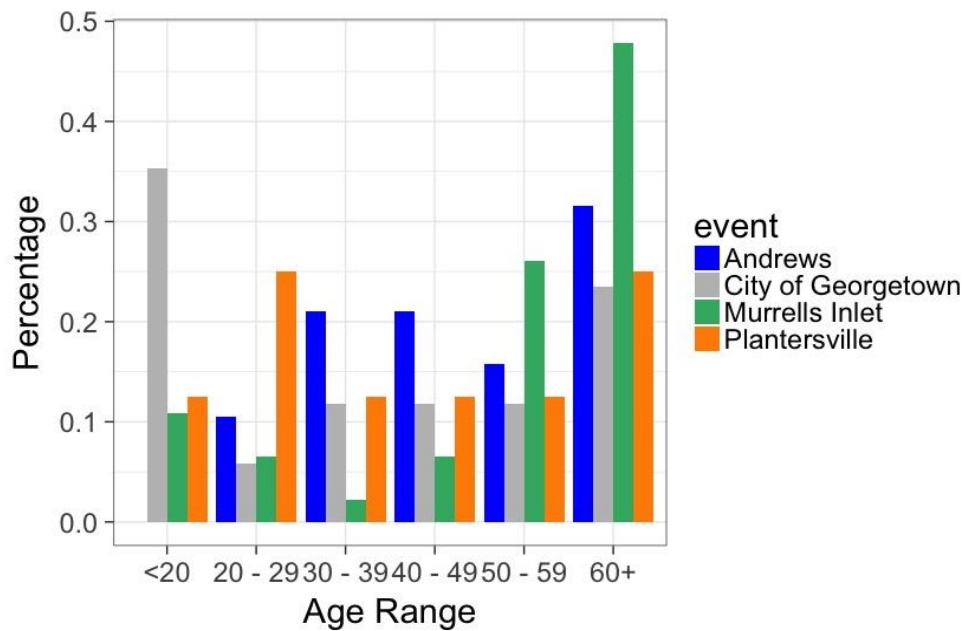


Figure 1. Ages of workshop participants. Waccamaw high school students were all 14 to 18 years old; CCU students were 18 to 32 years old (City of Georgetown, n = 21; Murrells Inlet, n= 55; Plantersville, n= 8, Andrews, n = 19; Waccamaw High School, n = 88; CCU, n = 14)



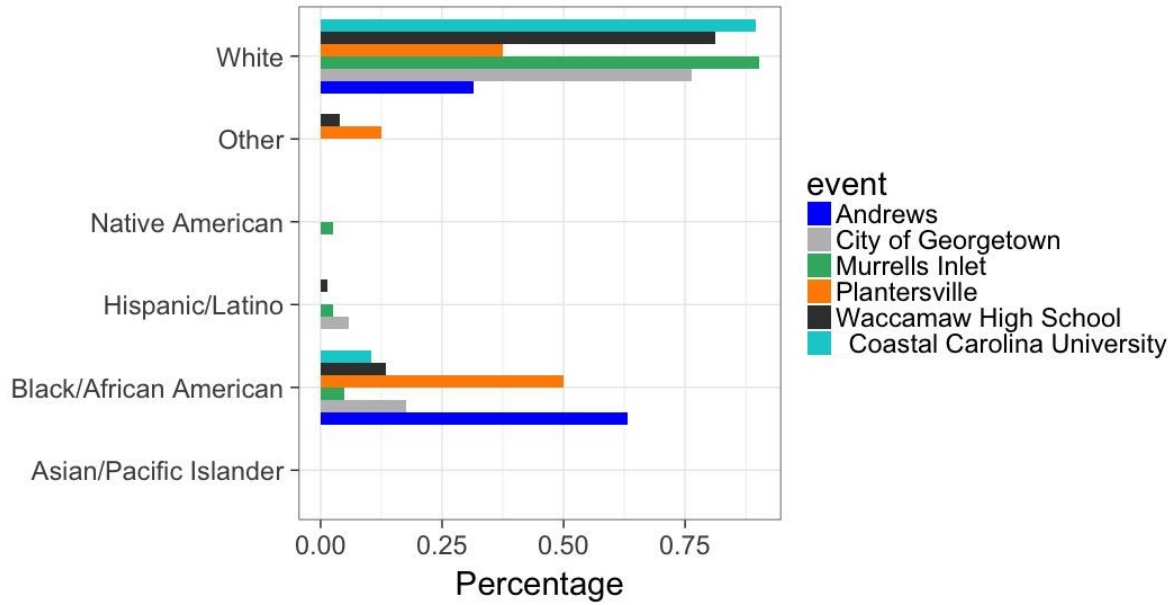


Figure 2. Ethnicity of workshop participants (City of Georgetown, n = 21; Murrells Inlet, n= 55; Plantersville, n= 8, Andrews, n = 19; Waccamaw High School, n = 88; CCU, n = 14)

### Survey Results

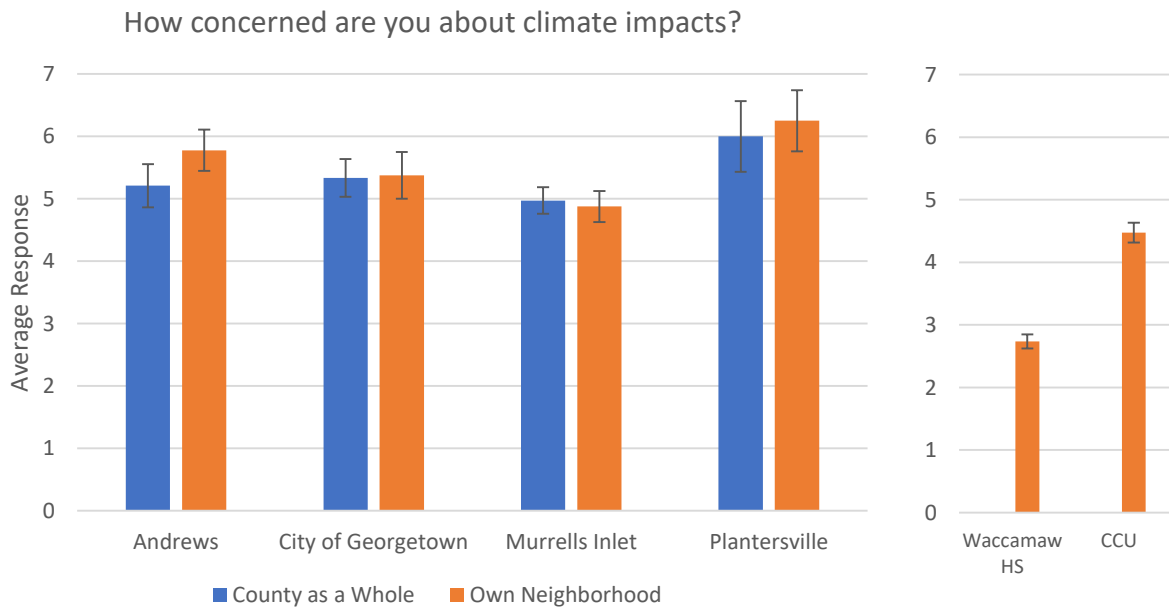


Figure 3. Level of concern about the impacts of climate change on a scale of 1 – 7 (average  $\pm$  standard error)

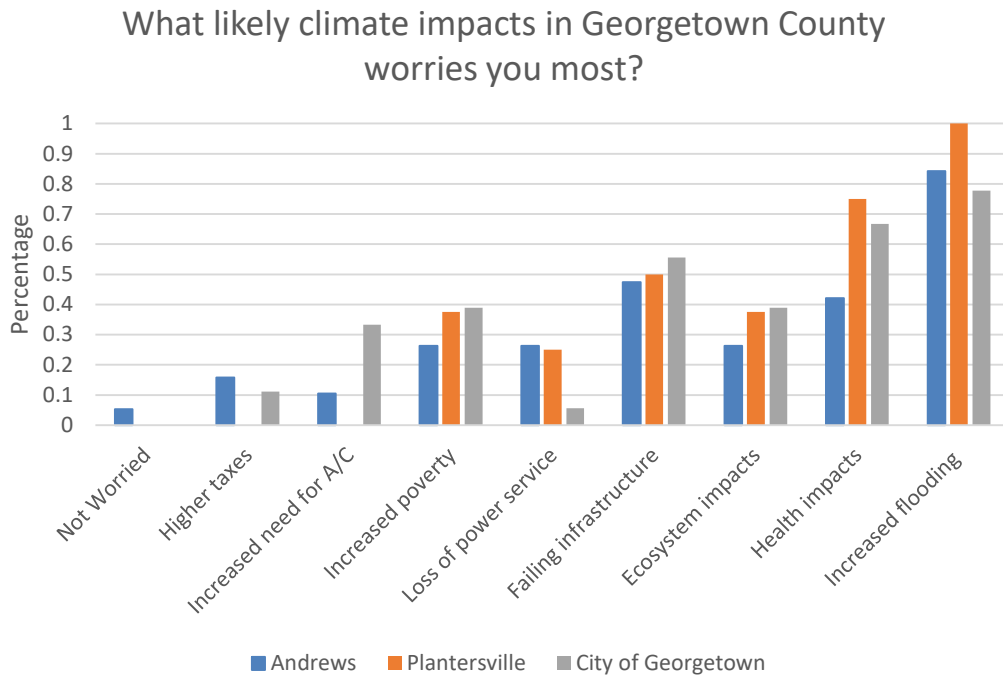


Figure 4. Percentage of responses. Respondents selected top three options (No data for Murrells Inlet)

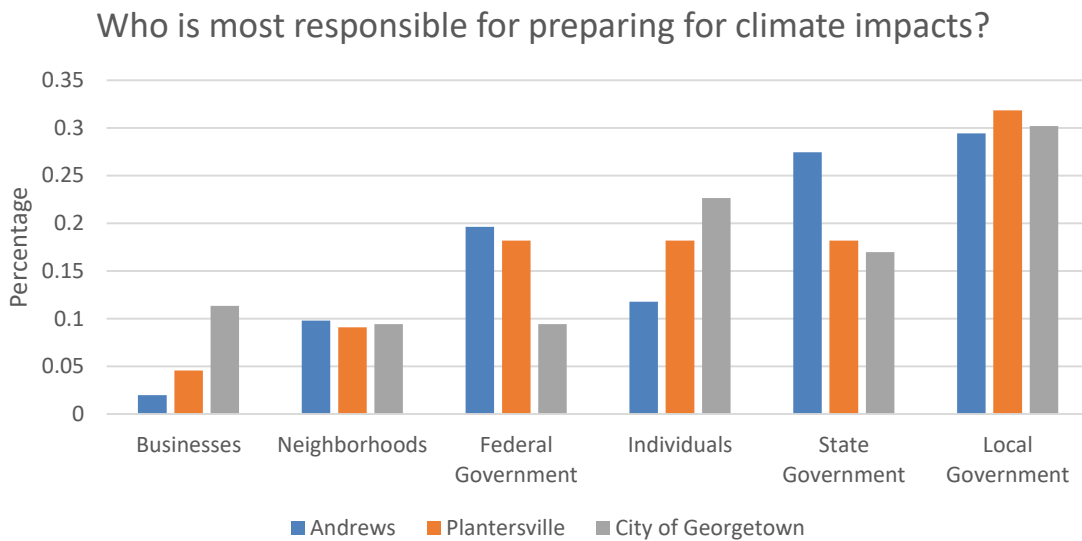


Figure 5. Percentage of responses. Respondents selected top three options (No data for Murrells Inlet)



Question: How significant do you think climate change **should be/ will be?** in planning and decision-making over the next ten years?

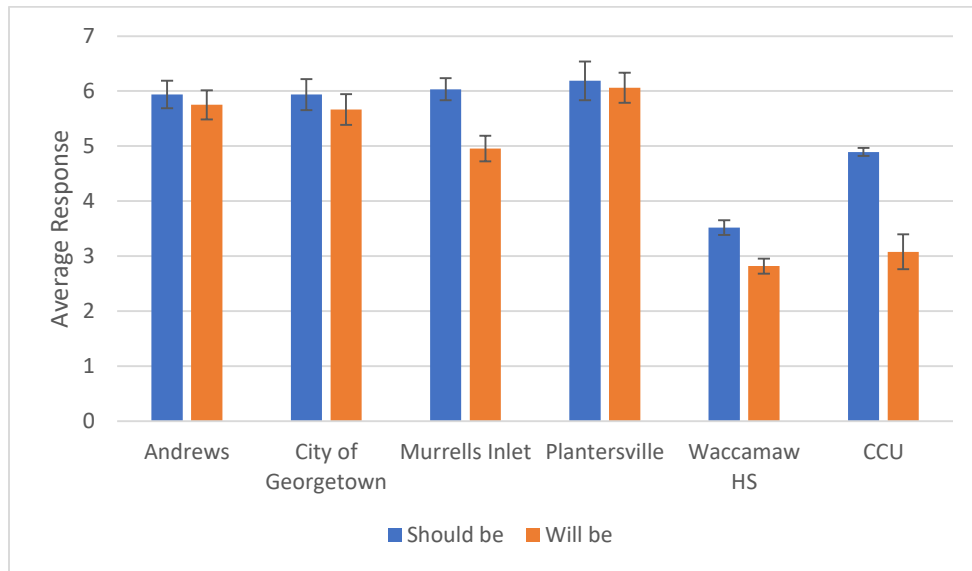


Figure 6. Level of support on a scale of 1 – 7 (average  $\pm$  standard error)

Question: How important is it that **stakeholders** be involved in deciding how we should respond to climate change risks?

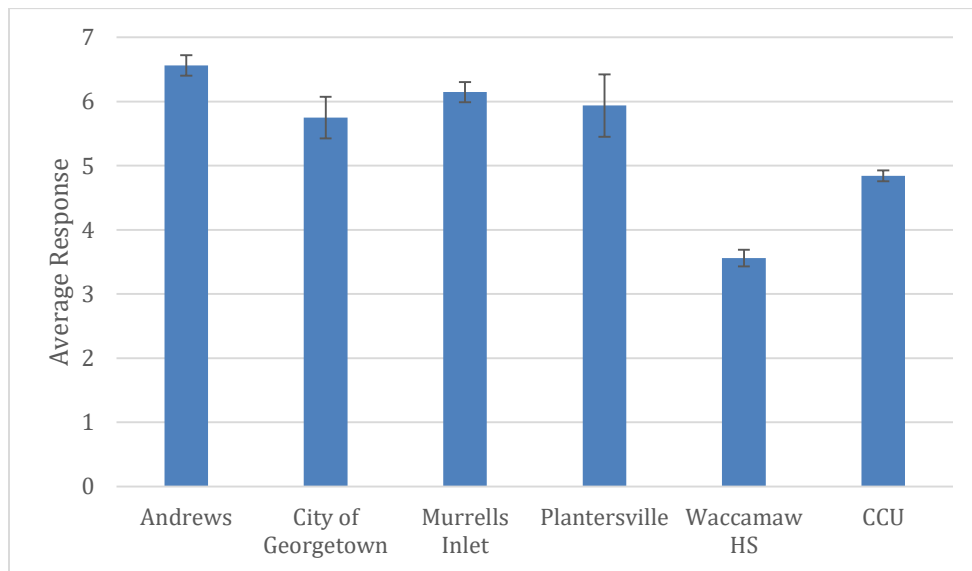


Figure 7. Level of support on a scale of 1 – 7 (average  $\pm$  standard error)

## Debrief and Discussions



Figure 6. Word Cloud with most frequent words used during written comments/feedback from community workshops

### Results of Key Survey Questions for Future Planning

#### What did you learn?

- Mediator is necessary for diverse conversations
- Setting priorities is a necessity for the county
- Consensus-based decision making versus majority based decisions
- Stakeholder diversity is important
- All options must be on the table and visible to discuss
- Long term goals versus imminent/short term
- Negotiation is critical in a safe environment
- Listening
- Stop pointing fingers and blaming
- Different roles of county officials – many do not understand these roles
- Diversity of perspectives
- Learning from other people
- Climate change must be taken seriously
- Expanded role of environmental services position
- The interconnection of sustainable development overall and planning
- More information is desired from citizens

## **Key Quotes**

*I learned to stop pointing fingers and see myself as part of the solution*

*[Role Play Simulations] with elected officials are a safe place to discuss 'unsafe' topics*

*I learned I can advocate for things I don't agree with*

*I could change my mind based on the role and hearing from others*

*Being the mediator provided insight into how to manage priorities despite strong opposing views*

*Yes, what other people in the community might be considering due to their situation experience and role in the community*

*Climate change must be taken seriously*

*It is important to consider a wide variety of stakeholders and to think about both imminent projects and long term projects for the future*

*Each community doesn't have a sense of unity throughout the county. We have to find a way to look at the problems as county issues and not just area specific*

## **Should a decision-making process like this be attempted in real life in your community?**

- Helps generate new ideas
- Understand different perspectives
- Create a safe place to discuss difficult, "unsafe," topics
- Use of data in decision making is important
- Having such a community process could help communicate to the public
- The process allows people to express their deep concern for flooding and climate change
- Need to hear different voices with different perspectives
- Such a process gives citizens the opportunity to compromise
- Create community-relevant solutions
- Need to bring everyone to the table and respectively share insights

## **Key Quotes:**

*I think it would open eyes to different stakeholders and views*

*Different urgency between city and county officials*

*Yes, important to bring all the stakeholders to the table*

*Yes, it lets people learn and understand different perspectives*

## **Policy Recommendations**

We recommend **Community Task Forces** that:

- Bring the community together to describe a shared vision for the future;
- Help the communities to visualize and understand the nature of shared risks and possible adaptation solutions;
- Produce a set of specific recommendations for policy improvements, capital investments, open space/access opportunities and future studies that will move the community toward their vision and greater resilience;
- Position communities to implement the recommendations and to better compete for future state and federal support for waterfront improvements;
- Build a network of community members and stakeholders with training and experience in planning for waterfront resilience.
- Create a resilience plan as part of the comprehensive planning process
- Produce scientifically-based maps and share information
- Provide informational sessions in flood zone areas for preparation and education

### **Examples:**

Hudson River Plan

<https://www.scenichudson.org/sites/default/files/kingston-waterfront-flooding-plan.pdf>

Resilient Oakland Plan

<https://www.dropbox.com/s/7o6mnlh3kt1szo4/Resilient%20Oakland%20Plan.pdf?dl=0>

City of Tybee Island Sea Level Rise Adaptation Plan

<https://www.cityoftybee.org/DocumentCenter/View/400/Response-to-Sea-Level-Rise---Executive-Summary-of-June-2013-PDF?bidId=>

Beaufort County Sea Level Rise Adaptation Plan

[http://www.scseagrant.org/pdf\\_files/Beaufort-Co-SLR-Adaptation-Report-Digital.pdf](http://www.scseagrant.org/pdf_files/Beaufort-Co-SLR-Adaptation-Report-Digital.pdf)

City of Folly Beach Sea Level Rise Adaptation Report

[https://www.cityoffollybeach.com/wp-content/uploads/2017/05/Folly-Beach-Sea-Level-Rise-Adaptation-Report\\_FINAL.pdf](https://www.cityoffollybeach.com/wp-content/uploads/2017/05/Folly-Beach-Sea-Level-Rise-Adaptation-Report_FINAL.pdf)

---

<sup>1</sup>**Resilience** is the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events, as defined by the National Academies of Science.

### **Acknowledgements**

This project was funded by a NOAA Science Transfer Grant. We are grateful to the communities of the City of Georgetown, Georgetown County, the Town of Pawleys Island, and the Town of Andrews for their support and engagement. Thank you to the Frances P. Bunnelle Foundation, the Village Group, MI2020, and Black River United Way for supporting community workshops. Special thanks to CCU student assistants, John Quinn and Kaitlyn Montrief.