

**ASSESSING THE SEA-LEVEL RISE GOVERNANCE GAP IN THE CHARLESTON
TRI-COUNTY AREA**

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

MASTER OF SCIENCE

in

ENVIRONMENTAL AND SUSTAINABILITY STUDIES

by

EMMI PALENBAUM

AUGUST 2022

at

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

Approved by:

Dr. Matthew Nowlin, Thesis Advisor

Dr. Annette Watson

Dr. Susan Lovelace

Dr. Kendra Stewart

Dr. Kameelah Martin, Dean of the Graduate School

ABSTRACT

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The South Carolina coast has experienced over a foot of sea-level rise since the beginning of the 20th century and now expects an increase of one to two inches of sea-level rise per year. Home to more than 802,000 individuals, communities in Charleston, Berkeley, and Dorchester counties are threatened by the impacts of sea-level rise, including flooding and public safety problems, degradation of infrastructure, and destruction of ecosystems and their services. In order to effectively plan and implement mitigation strategies that protect the tri-county area's people and resources, stakeholder collaboration across all levels is necessary. To assess the current state of communication amongst actors, this study identifies key groups and individuals involved with sea-level rise planning at various governance levels and examines stakeholders' perceptions of the issue, preferences for policy action, and limitations to collaborative efforts through a survey. Responses find that policy actors have general agreement on the timeline and concern for sea-level rise impacts, but have mixed experiences with the level of collaboration on this topic and varying priorities for policy action. Results from this study can support improvement of communication among stakeholders to move forward in finding strategies to mitigate sea-level rise impacts and increase the tri-county area's resilience.

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CHAPTER 1

INTRODUCTION

Problem Statement

Located in the lowcountry of South Carolina, Charleston, Berkeley, and Dorchester counties rely heavily on the coastal environment. Known for its beautiful beaches, rich history, fresh seafood, and much more, the tri-county area of coastal South Carolina has become both a popular destination for new residents and a tourist hotspot, an industry that is responsible for a large portion of its year-round economy. In 2017, the economic impact of the tourism industry in the greater Charleston area was \$3.7 billion (Palkowski, 2018). There are currently more than 802,000 residents in Charleston, Berkeley, and Dorchester counties, collectively (U.S. Census Bureau, 2019). Additionally, more than 30 individuals are relocating to the tri-county area daily, further challenging historical infrastructure and resource capacity as well as monitoring capabilities. Estimated in the Fourth National Climate Assessment, “the combined impacts of sea level rise and storm surge in the Southeast have the potential to cost up to \$60 billion each year in 2050 and up to \$99 billion in 2090 under a higher scenario (EPA, 2019).

CHAPTER 2

LITERATURE REVIEW

Sea-level Rise and the Charleston Area

Sea-level rise is the increase in surface level of the ocean due to thermal expansion and melting of ice caps (*National Oceanic and Atmospheric Administration*). These conditions also contribute to an increased frequency and intensity of storms such as hurricanes, and lead to elevated levels of rainfall. Given that areas of Charleston, Berkeley, and Dorchester counties are either directly on the coast or in very close proximity to the ocean, they are both dependent on and vulnerable to their natural environment. A rising sea threatens the economic stability of the tri-county area, safety of residents and visitors, functionality of infrastructure, and well-being of ecosystems and their services. Paired with naturally occurring high tides, the effects from saltwater intrusion and erosion approach vital infrastructure and drainage systems. Port operations and economic dependency on its functionality are also vulnerable to these possible scenarios, an industry responsible for one in ten South Carolina jobs and accumulating a \$7.8 billion annual impact in the Lowcountry (*SC Ports Authority, 2021*). Compounded with significant increases in heavy rainfall, coastal cities like Charleston and the surrounding area are especially vulnerable to recurring and worsening flooding.

According to tidal data gathered by National Oceanic and Atmospheric Administration (NOAA), the Charleston area has already experienced 1.07 feet of sea-level rise in the past century (City of Charleston, 2019). As noted in the Flooding and Sea Level Rise Strategy completed by the City of Charleston in 2019, almost half of the total amount of sea level rise in the last century has occurred in the last two decades, which is approximately 0.5 ft. Figure 1 below displays the various sea level rise trends and projections through the year 2100, with the highest scenario estimating up to seven feet of sea-level rise by the end of the century. Current projections expect the South Carolina coast to experience an increase of one to two inches of sea-level rise per year. By 2045, tidal flooding is projected to strike up to 180 days per year in the Charleston area, an alarming increase from the average of two flood days in 1970 (*National Oceanic and Atmospheric Administration*). Sea level rise will also degrade important ecosystems and environments in the area; a 1.0 meter increase in sea level rise shows an 80% decrease in marsh, a 61% decrease in beach, and a 99% increase in open water (Bures & Kanapaux, 2011).

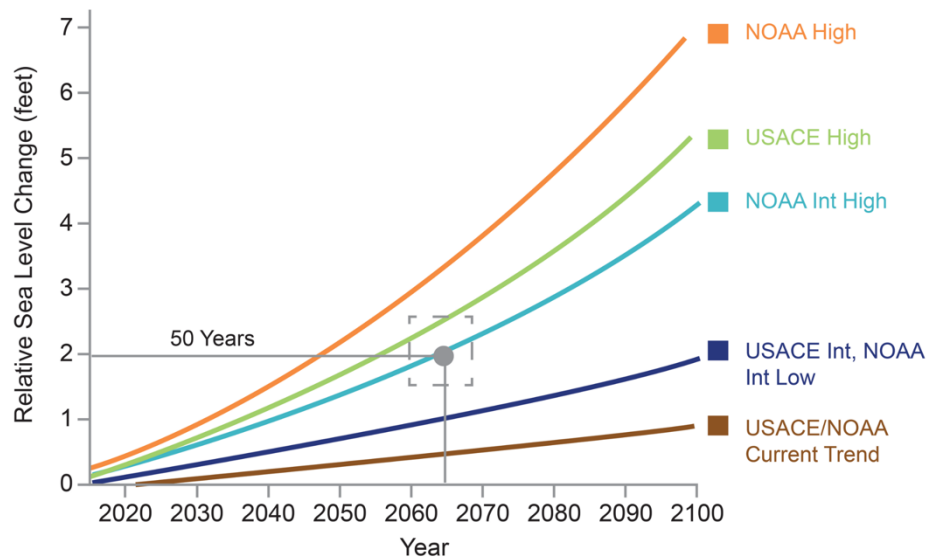


Figure 1. Planning parameters for 50-year outlook, based on sea level change projections by U.S. Army Corps of Engineers and NOAA - Charleston, SC (City of Charleston, 2015)

Better stated, sea-level rise threatens the habitability of South Carolina’s coastline. Figure 2 displays the progression of current sea-level rise conditions and the projections through the end of the century, where average sea-level rise in the Charleston area has increased nearly a foot since 1930. Nearly half of that has occurred in the past two decades, indicating that the rate of sea-level rise is also growing. While current plans in Charleston are based on two to three feet of anticipated sea-level rise in the 50 years, NOAA has indicated that this would be an intermediate scenario.

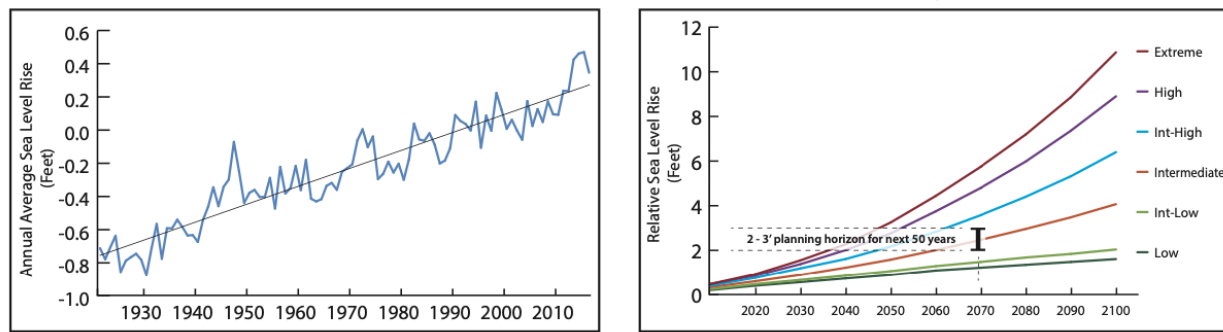


Figure 2. Observed Sea Level Rise in Charleston Harbor and Sea Level Rise Projections for Charleston (City of Charleston, 2019)

The reality is that the tri-county area will have to adapt to live with water; this may take many forms as stakeholders communicate and approach sea-level rise adaptation in the face of uncertainty. Historically, in much of the lowcountry - especially the Charleston peninsula - water has been present. The City of Charleston was originally settled in 1670, when the width of the peninsula was less than two miles across at its widest point (Bures & Kanapaux, 2011). Following this settlement and development, the Charleston area, especially on the peninsula, has undergone many reclamation projects over the past couple of centuries that have physically rerouted water and altered natural processes. Many of these projects were in efforts to expand the

city of Charleston's boundaries by building upon the Ashley and Cooper riverbanks and filling in land to accommodate influxes of residents and opportunities for development (Butler, 2020). Sewage systems and water lines were introduced in the late 1800s and early 1900s, and this infrastructure is pressured today by coastal development and growing flooding (Butler, 2020). "Factors that influence Charleston's drainage efficacy and flooding potential include the range of the tides, volume of rainfall, land use changes, and the natural geography and elevation of the city" (Butler, 2020). The Charleston area contains both natural and man-made defenses against the rising sea, including intricate tidal wetlands, native topsoil, and the historical Battery on the peninsula. However, sea-level rise thresholds will challenge and permanently alter these protective structures and environments. As a result of this lost natural infrastructure, flooding will worsen and the coast and further inland will become more vulnerable to storms such as hurricanes and regular rainfall.

It is acknowledged that individual actors have begun to plan for these types of hazards in the Charleston area, so this study aims to understand who is involved and how they interact. To combat the projected environmental changes, continued research is needed to assess current management strategies and to adjust mitigation efforts accordingly moving forward. It is necessary for the many decision-makers in the tri-county area to have access to current data and to work together to implement progressive solutions. This research focuses on the status of sea-level rise planning in the tri-county area of coastal South Carolina (Berkeley, Charleston, and Dorchester counties). First, a network of agencies is established of agencies that are involved with building resilience into sea-level rise mitigation strategies within the chosen area. Using the Ecology of Games Theory, venues in which these institutions and stakeholders interact are

examined, as well as how they affect one another in terms of collaborative efforts. Venues include hazard mitigation plans, comprehensive plans, and other coordinated efforts.

Polycentric Governance and The Ecology of Games

Polycentric governance is “a social system composed of many decision centers having power to make decisions” (Anderies & Janssen, 2016). Within the context of managing natural resources and social-ecological systems, polycentric governance can expand adaptive capacity through overlapping jurisdictions and redundancy of actors (Carlisle & Gruby, 2019). This can also promote learning and trust amongst stakeholders. Polycentricity within an SES assumes the complexity of the system and avoids the panacea theory, a concept defined by Elinor Ostrom as the recommendation that “a single governance-system blueprint (e.g., government ownership, privatization, community property) should be applied to all environmental problems” (Ostrom et al., 2007). Rather, polycentricity allows for evaluation of each individual problem, and consideration of appropriate solutions within the context of the issue. The tri-county area is made up of a polycentric governance system, and the issue of sea-level rise can be approached as a collective action problem, meaning it should be recognized that multiple action arenas are occurring at various levels. To solve this collective action problem, the system users - specifically those who rely on infrastructure systems and those who manage them - must interact across a multilevel governance system to construct and implement sea-level rise adaptation strategies (Lubell et al., 2021). Among these various levels, actors engage in decision making regarding approaches to sea-level rise issues, although they may not necessarily agree on how to solve them. This disagreement on strategic approach creates a gap between conversation and implementation, complicating and slowing down the process of hazard mitigation.

Analyzing polycentric governance systems in the context of collaboration and actor preferences can be a challenge. The Ecology of Games Theory aims to bridge the gap between conversation and action by “considering how the structural linkages among actors, issues, and institutions evolve over space and time, and how the social processes that occur within the complex system produce operation rules governing resource use” (Berardo & Lubell, 2019). Further, the EGT elicits a framework for assessing both the structure, meaning the “architecture of the system,” and function, meaning “the dynamic processes that operate within the system and affect its change and performance,” of a social system (Berardo & Lubell, 2019). To assess these components, the EGT examines three components of polycentric governance structure: informal and formal rules that define decision making and its participants at each level, “patterns of interactions among policy actors, and the level of interconnections among policy-relevant issues” (Berardo & Lubell, 2019).

In the San Francisco Bay area, a study was conducted to evaluate the structure of governance surrounding sea-level rise policy and hazard mitigation. This ‘governance gap’ report examines the issues between stakeholder agreement on the existence of an issue and the effective strategy implementation (Lubell, 2017). Lubell (2017) identifies the governance challenges associated with sea-level rise planning and the communication barriers among stakeholders on various levels, including local, regional, state, and federal. The study consisted of nine counties in the middle California region and was a two phase component of a larger qualitative case study project funded by National Science Foundation called Resilience of Infrastructure as Seas Rise (RISer). The first phase consisted of an extensive document review including comprehensive plans and sea-level rise strategy plans to organize a list of initial contacts, followed by formal semi-structured interviews to identify critical stakeholders

representing the aforementioned entities. After data coding was completed, a survey was developed that assessed the current state of collaboration and existing problems with management progress (Lubell, 2017). Spanning across the regional, county, and local levels, they received over 700 responses (Lubell, 2017). The aim of this governance gap report was to understand current challenges, provide potential solutions, and offer recommendations for regional cooperation and to build a foundation for adaptive capacity in the Bay area (Lubell, 2017). Overall, stakeholders agreed upon the need for multi-level cooperation, but also recognized the challenges associated with it. Ultimately, the report identified seven key governance challenges to sea-level rise management and offered a set of action item recommendations to improve adaptive capacity and foster collective learning in the near future.

Within the study area in South Carolina, there are 21 comprehensive plans. While Charleston county and Dorchester county comprehensive plans mention sea-level rise, Berkeley county does not include it. Additionally, the regional plan that includes these three counties does incorporate sea-level rise (Kimmelblatt, 2021). Originally published in 2015 and revised for a second edition in 2019, the City of Charleston has developed a Sea Level Rise Strategy that examines infrastructure status and emergency preparedness and response. The 2019 report bases planning measures on the two to three feet of sea-level rise by 2070 scenario in the Charleston area, however that is represented as only the intermediate projection made by NOAA in the next fifty years. There are also sea-level rise specific plans for the City of Folly Beach, completed in 2017, and for the Town of Kiawah Island, completed in 2018.



Figure 3. Berkeley-Charleston-Dorchester Study Area (Berkeley-Charleston-Dorchester Council of Governments, 2022).

Network Analysis of Charleston, Berkeley, and Dorchester Counties

Using network analysis, we are able to focus on the structure of relationships between actors, the implications for behavior and performance, and ways to measure collaborative capacity. Weber and Khademian (2008) define effectiveness in networks as “collaborative capacity (i.e., long- and short-term problem-solving capacity), improved policy performance, and the maintenance of accountability for public action.” Management challenges associated with networks can be as follows: problems are unstructured, which can cause target outcomes to shift and make drawing cause and effect connections difficult; subsets of problems can be cross cutting, both in scale, level of government, and discipline; and issues are relentless, meaning there is no one solution (Weber & Khademian, 2008). The issue of sea-level rise certainly fits

into this category of ‘wicked problem,’ and thinking about the network in terms of collaborative capacity building helped guide my research project.

To understand collaborative efforts amongst actors in this study, we can investigate relationships across stakeholders to reveal how this shapes the network as a whole. ‘Bridging’ capital provided by central actors is necessary in trying to solve coordination problems, while ‘bonding’ capital reduces the tendency of defection and therefore enhances cooperation (Berardo, 2014). Berardo and Lubell (2016) explore potential bridging and bonding patterns in actor participation within complex governance systems to analyze affiliation (two-mode) networks, where nodes connect to each other through participation in joint ‘events’. Strong bonding capital is observed when stakeholders are connected by engagement in multiple forums, where they build trust, relationships, and capacity for collaboration. Weaker bonding capital results when stakeholders engage in one primary forum, but do not share other forums with each other, making it difficult to create stability and establish trust. Each stakeholder brings with them to forums their own ‘political knowledge’: information that an actor possesses about the policy preferences and strategies of other policy actors, which can be acquired through participation in policy forums and learning of others’ positions and actions (Berardo & Lubell, 2016).

Berardo and Scholz (2010) discuss the risk hypothesis as motivation for actors in networks, which “argues that actors seek bridging relationships (well-connected, popular partners that maximize their access to information) when cooperation involves low risks, but seek bonding relationships (transitive, reciprocal relationships that maximize credibility) when risks of defection increase.” In a network, the context of risk shapes the system dynamics and its partnerships (Berardo & Scholz, 2010). It has been argued that in high-risk settings, actors are incentivized and more likely to form relationships in favor of a common goal (Henry & Vollan,

2012). In collective-action problems emerges a discussion of interdependence; benefits and costs are highly dependent upon others' actions and decisions within the community (Lubell & Robbins, 2021).

Research Question

What is the current state of collaboration between identified sea-level rise planning stakeholders and governing agencies in the Charleston tri-county area?

CHAPTER 3

METHODOLOGY

Applying The Ecology of Games Theory

The first step in applying the EGT to this project is to recognize the various policy forums that are operating in the sea-level rise tri-county area. The structure of the tri-county system was informed through a review of various documents that can clarify key actors in the system such as the Dutch Dialogues report, comprehensive plans and sea-level rise strategy plans in the area, and individuals who have commented on policy actions such as the proposed seawall for the Charleston peninsula. The EGT assesses relationships between institutions and how they impact policy issues and decision making. While sea-level rise is a global collective-action issue, local and smaller scale planning decisions can make critical decisions and changes to help mitigate the issue. The topic of sea-level rise is highly interconnected at the tri-county area level, given the governance and social system structure of the area. This project aims to provide some insight as to the motivations and strategies between stakeholder decision-making and collaboration in order to contribute to a discussion of how the tri-county system can or will need to evolve to adapt for sea-level rise, which can reveal information about its functionality. As identified by Berardo and Lubell (2019), although decisions are made by actors independently within policy forums, they may positively or negatively affect other actors within the system.

Therefore, the EGT is especially useful in examining the interdependency between the system and potential externalities that can occur from actions made by various institutions, creating an opportunity for learning and coordination among actors across levels (Berardo and Lubell, 2019). Structural characteristics in a complex governance system include informal and formal rules that guide decision making, patterns of interactions among policy actors, and how interconnectedness takes form within the network. Additionally, the primary characteristic of function in a complex governance system is how cooperation takes shape to achieve a collective goal or outcome.

Identifying Participants for Key Informant Interviews and for the Survey

To achieve the objectives of this research, a diverse set of stakeholder perspectives were pursued through a digital survey. Targeted stakeholders represent individuals and groups that address problems associated with sea-level rise and mitigation in the tri-county area at various levels of governance including municipalities within Berkeley, Charleston, and Dorchester counties; state agencies; policy and decision-makers, including elected and administrative officials; non-governmental organizations; academic institutions; critical infrastructure agencies; engineering and design firms; and other individuals that engage in community leadership or reside in the tri-county area. Potential groups and individuals were first found through an extensive document review that included various comprehensive plans, sea-level rise strategy and hazard mitigation plans, the Dutch Dialogues report completed in 2019, comments in public forums such as the proposed seawall project in Charleston, and various committees within local government. Individual municipal comprehensive plans with a publication date older than 2015 were not included in my review or network analysis. This includes the Town of Awendaw (2010) and Town of Meggett (2014). The year 2015 was selected as the cut-off date because this is

when many of the flooding and hazard mitigation efforts heavily began in the tri-county area, due to historic flooding events of that year that made the need for climate change planning clear. The venues, with the exception of a few older comprehensive plans, were all active or completed within the last five years. Aside from plans and reports, other venues included the Charleston Resilience Network Advisory Committee/Transition Board, Charleston Resilience Network membership, City of Charleston Resiliency and Sustainability Advisory Committee, the Charleston Seawall project public comments, and the City of Charleston's Army Corps of Engineers 3x3 Flood Protection Study Citizen and Business Advisory Committee. See Appendix A for more details about the complete list of reviewed reports and venues.

In total, 34 documents and reports of venues were reviewed, 19 of which are comprehensive plans. In this process, documents were read and coded for content topics including sea-level rise, hazard mitigation, natural resource usage and conservation, and climate change. Based on the extent of which these topics were included, I gathered the contact information for team members responsible for the associated sections. When conducting the network analysis, only comprehensive plans that specifically discussed sea-level rise and or climate change were included as a venue, which totaled 11.

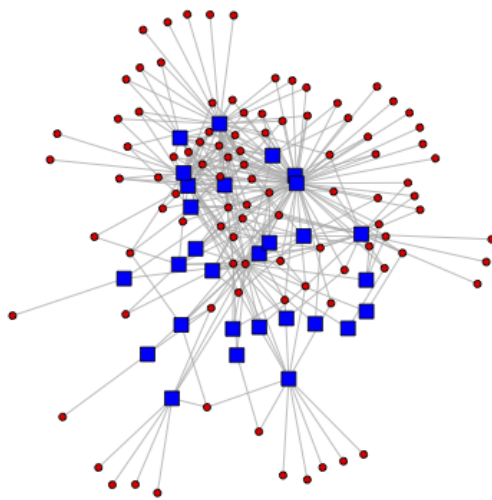
There are many notable collaborative sea-level rise and resilience efforts in the tri-county area over the last decade, especially in response to the major flooding events in 2015. The Dutch Dialogues is a study and report completed in 2019 through a partnership with organizations and professionals to assess current and predicted scenarios for Charleston, South Carolina in terms of living with water and reducing risk. The team of engineers, architects, designers, and planners collaborated to examine challenges associated with flooding and changing ocean conditions to present recommendations for a resilient community. Planning stages began in 2017, followed by

stakeholder engagement and colloquium, a design workshop, and more, with the report finished in fall of 2019. Though this report does not cover the entirety of my research's study area, the project did heavily focus on the peninsula of Charleston and other areas within Charleston county (*Dutch Dialogues Charleston*, 2019). The U.S. Army Corps of Engineers Charleston Peninsula Coastal Storm Risk Management Study is a federally-funded feasibility study to explore coastal impacts from storm surge and to evaluate potential risk reduction solutions for the Charleston peninsula (*United States Army Corps of Engineers*). The study, in conjunction with the City of Charleston and local stakeholders, began in 2018 and is in the process of producing a report for congressional review. In earlier phases of the project, comments from local agencies, organizations, and individuals were gathered for consideration.

The Charleston Resilience Network is a “collaboration of public, private, and non-profit organizations seeking to enhance the resilience of our region and communities” (*Charleston Resilience Network*). Formed in 2014, the network has a membership of over 400 individuals and connects a wide range of organizations working together to address resilience issues in the region.

While most of the comprehensive plans within the study area note the importance of natural resources and offer recommendations for their protection, only some specifically mention sea-level rise, a changing climate, or the necessity to build community resilience. However, a piece of legislation was passed in September 2020 which requires municipalities in the state to add a resilience element to comprehensive plans moving forward. The legislation, known as the South Carolina Disaster Relief and Resilience Act, aims to expand South Carolina's resilience and response to natural disasters and flooding events. Through this act, the South Carolina Office of Resilience (SCOR) was also established, a state agency devoted to coordinating these efforts

and “developing, implementing, and maintaining a Strategic Statewide Resilience and Risk Reduction Plan” (South Carolina Disaster Relief and Resilience Act, 2020). The Resilience Plan is in progress and was not included as a venue for this research, though several respondents noted their involvement in the planning process. According to the SCOR website, advisory committee members for the Resilience Plan include: S.C. Department of Natural Resources, S.C. Emergency Management Division, S.C. Sea Grant Consortium, S.C. Department of Health and Environmental Control, S.C. Ports Authority, U.S. Army Corps of Engineers, and more (*South Carolina Office of Resilience*).



Group	Count
Federal Government	3
State Government	7
Regional Government	1
Local Government	30
Academic/Education	7
Consulting/Research	19
NGO	21
Infrastructure	3
Multi-Stakeholder Group	4
Other	6

Figure 4. Two-mode Network and Actor Table

Figure 4 displays the two-mode network of the tri-county area, where the blue squares represent planning venues or forums and red circles are stakeholders. This analysis is intended to

reveal central actors and general centrality, to evaluate connections between actors through nodes or lack thereof, and display whether the network is dense and collaborative or contains gaps. There is a higher density of nodes connecting key actors and forums towards the center of the network, with a pattern of less involved actors spread around the outer perimeter of the network.

Before distributing the survey and in addition to reviewing documents, I identified a few key individuals that are well-connected within the tri-county area and are heavily involved in sea-level rise and resilience planning and requested brief conversations with each of them to discuss the project scope and potential participant groups. The goal of these conversations was to ensure that I had compiled a participant list that is representative of all groups necessary to have a complete picture of the system and who are impacted by tri-county sea-level rise decisions. I provided each of them with a list beforehand of documents that I planned to review and specific organizations from each sector that I hoped to gain survey responses from. During our conversations, I explained my research objectives and asked if there were planning efforts or organizations I was missing on my list. From these discussions, I added several non-governmental organizations and private sector representatives. The individuals I spoke with are Elizabeth Fly, The Nature Conservancy; Dale Morris, City of Charleston; Katie Gerling, Town of Mount Pleasant; Sarah Watson, formerly South Carolina Sea Grant Consortium; and Kathryn Basha and Kristin Miguez, Berkeley-Charleston-Dorchester Council of Governments.

Survey Data Collection

From these participants' perspectives, the study aimed to gather an understanding of the current state of governance in the tri-county area, inform next steps needed to adapt for sea-level

rise, and assist the progression of collaborative activities among stakeholders. The survey contained 27 questions, with additional contingent questions. The survey was initially adapted from Lubell et al. (2017) and expanded to address Charleston-area specific issues. Most questions remained similar to the original survey, but answer choices were changed a lot to reflect the Charleston context. The overarching themes that were assessed through the survey questions include: perceptions of sea-level rise scenarios and associated policies, preferences for mitigation strategies, and the status of organizational collaboration and stakeholder engagement. Additionally, questions were asked regarding the proposed seawall project happening on the Charleston peninsula to gauge support or lack thereof amongst professionals and stakeholders in the area. Finally, participants were given the option to suggest other individual participants or groups to contact.

To incentivize participation, respondents had the option to submit their name and email to be entered into a drawing for a \$50 Amazon gift card. This identifying information was kept separately from the survey responses and was not linked to their answers. The incentive was possible due to a research grant provided by the graduate school in the amount of \$250. Five names were selected once the survey was closed.

Survey Distribution

The digital Qualtrics survey was distributed via email contacts on April 27, 2022. It was originally sent to 223 individuals. The complete survey can be viewed in Appendix C. A reminder email was sent to the list on May 10, 2022 and May 31, 2022. On May 20, the survey was also sent out through a listserv hosted by S.C. Department of Natural Resources, filtered to target professionals within the tri-county area. Combining the listserv and suggested participants

with my original distribution list, the total number of individuals that were directly sent the survey was 918. The survey was closed on June 6, 2022, and received 151 responses.

Participants represented the following categories: federal government, state government, regional government, local government (cities, counties), non-profit/non-governmental organizations, consulting/research, infrastructure, and others.

CHAPTER 4

RESULTS/FINDINGS

Analysis

Analytical procedure varied between the survey questions, however, frequency statistics were run for the majority of questions. A two-mode network analysis was conducted to assess the structure of the system. As previously mentioned, this analysis revealed central actors and evaluated connections between actors through nodes. Questions 17-23 on the survey were used to formulate the function of the network to create a fuller picture of what type of actions have occurred between stakeholders and relationships that exist in the network.

Appendix B displays the 68 primary organizations/agencies that were represented through the survey. 27 respondents did not disclose their affiliation. To my knowledge, the following municipalities were represented through participation: Charleston County, Dorchester County, City of Charleston, City of Folly Beach, City of North Charleston, Town of Hollywood, Town of James Island, Town of Kiawah Island, Town of Moncks Corner, Town of Mount Pleasant, Town of Seabrook Island, and Town of Sullivan's Island.

Targeted stakeholders are categorized into the following groups: federal government, state government, regional government, local government, non-profit/non-governmental organization, consulting/research, education/academic institution, infrastructure, multi-

stakeholder group, and other. Local government entities are the top category in both contacted individuals and respondents. Non-profit/non-governmental organizations are the second highest category of respondents, followed by state government agencies. Notably, the respondents sample is largely proportionate in categorical representation to that of the contacted organizations.

Respondents' Role within Organizations

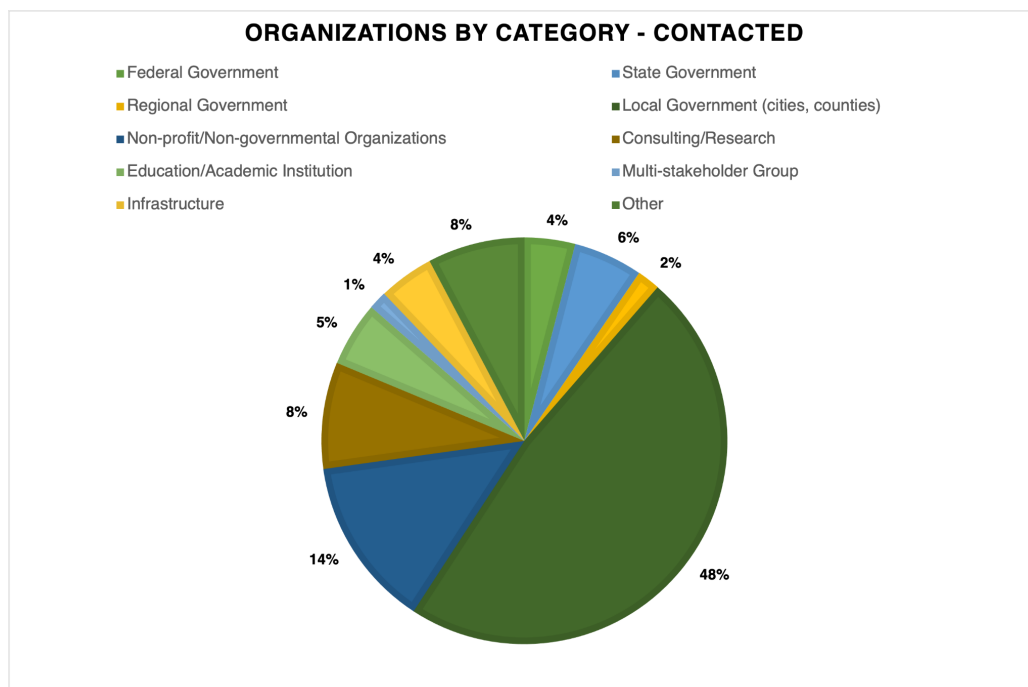


Figure 5. Contacted Organizations by Category



Figure 6. Responded Organizations by Category

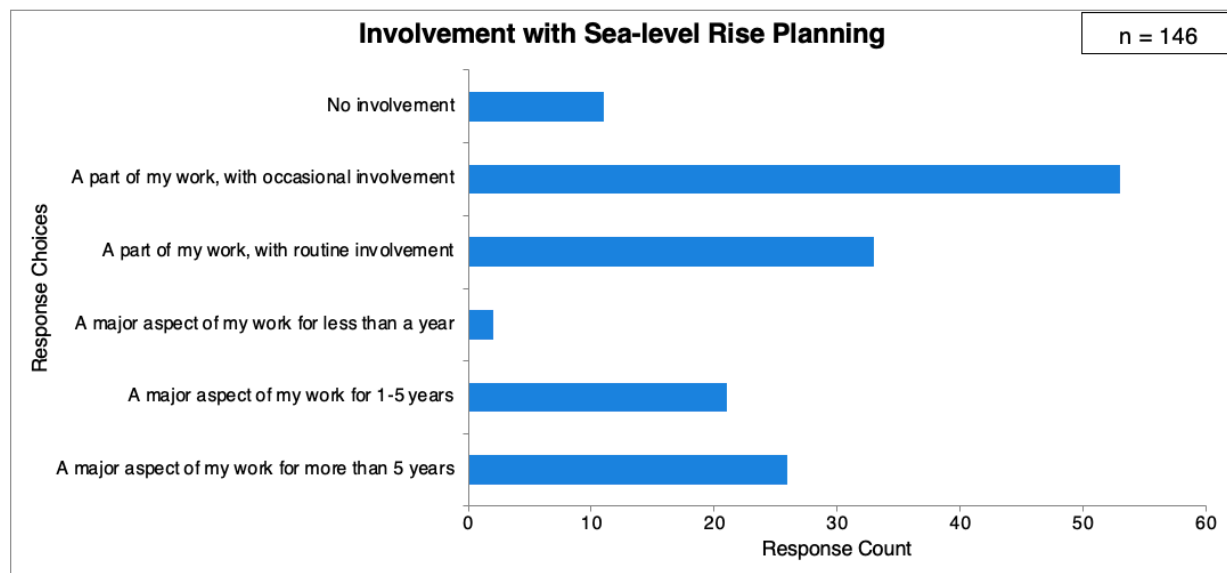


Figure 7. Level of Involvement with Sea-level Rise Governance

Q1: *Which of the following statements would best characterize your involvement with sea-level rise issues in the tri-county area (within Charleston, Berkeley, Dorchester counties)?*

Approximately one third of the respondents characterize their involvement with sea-level rise issues in the tri-county area as a part of their work, with occasional involvement. The majority of the remaining participants said sea-level rise issues have been a major aspect of their work, either in the last 1-5 years or more than 5 years. Finally, 33 participants answered that it is a part of their work, with routine involvement.

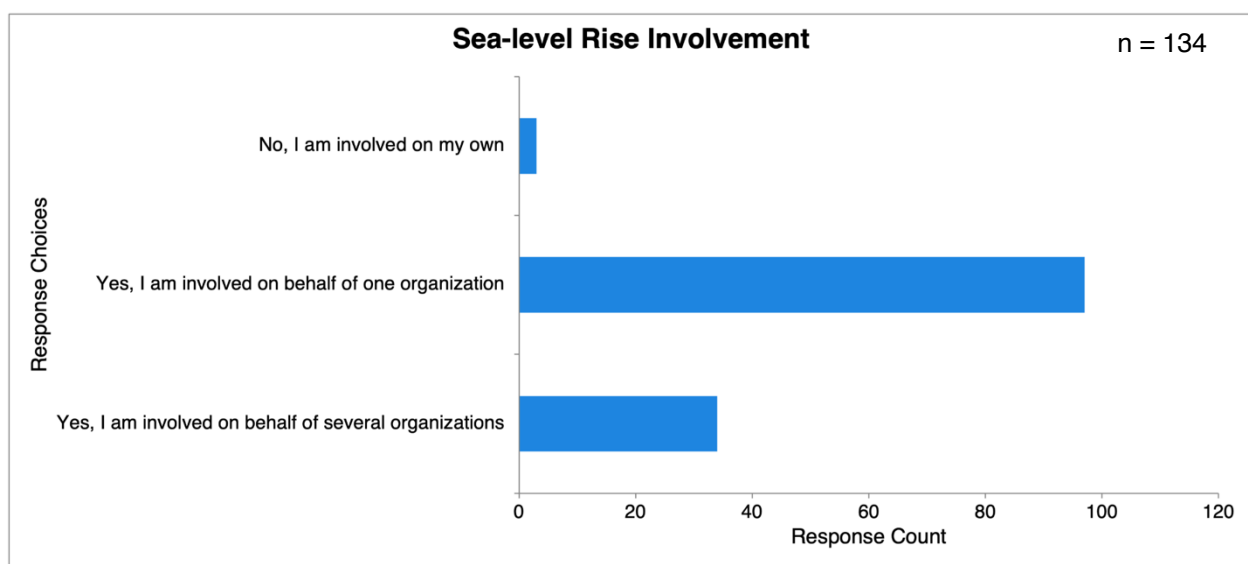


Figure 8. Type of Involvement with Sea-level Rise Governance

Q2: *Is your involvement in sea-level rise-related issues done on behalf of an organization you represent or work for?*

The majority of participants are involved with sea-level rise-related issues on behalf of a single organization, while the vast remainder are involved on behalf of several organizations. Only two participants identified their involvement on an individual level.

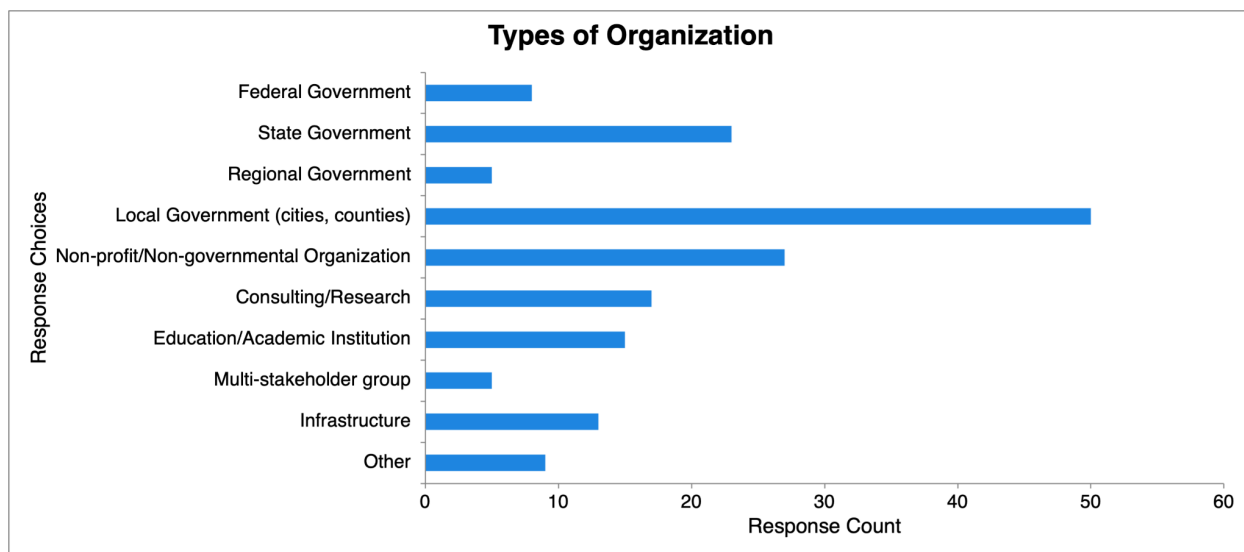


Figure 9. Categories of Respondents' Organizations

Q4: *Please choose the category or categories that best describe your primary organization*

(check all that apply):

One third of respondents identify themselves as local government, representing the cities and counties within the study area. Non-profit/non-governmental organizations are the second largest group represented with 27 respondents, followed by the state government with 23 respondents.

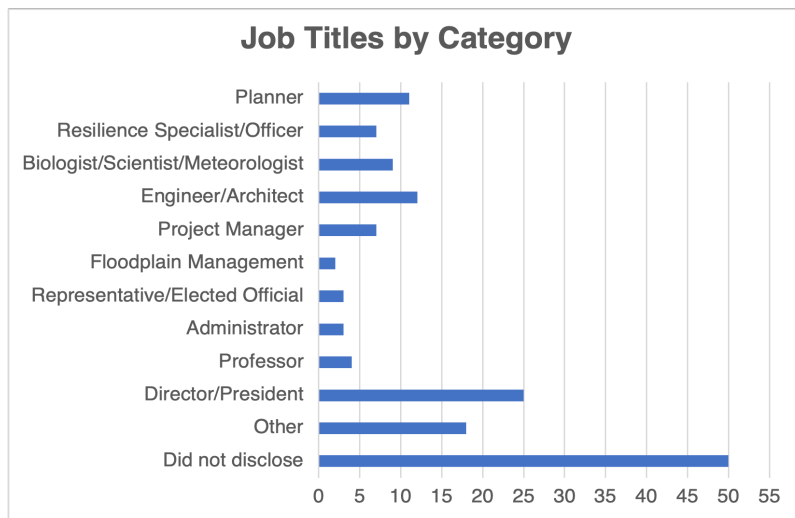


Figure 10. Respondents' Job Titles

Q5: What is your official job title?

101 respondents disclosed their job titles. Eleven categories, including “other,” were then created based on the answers. The leading job titles respondents held included “Director” or “President”, either over a department or an entire organization, with a total of 25. “Planner” and “Engineer/Architect” were next, with 11 and 12. However, 50 respondents did not disclose their job titles.

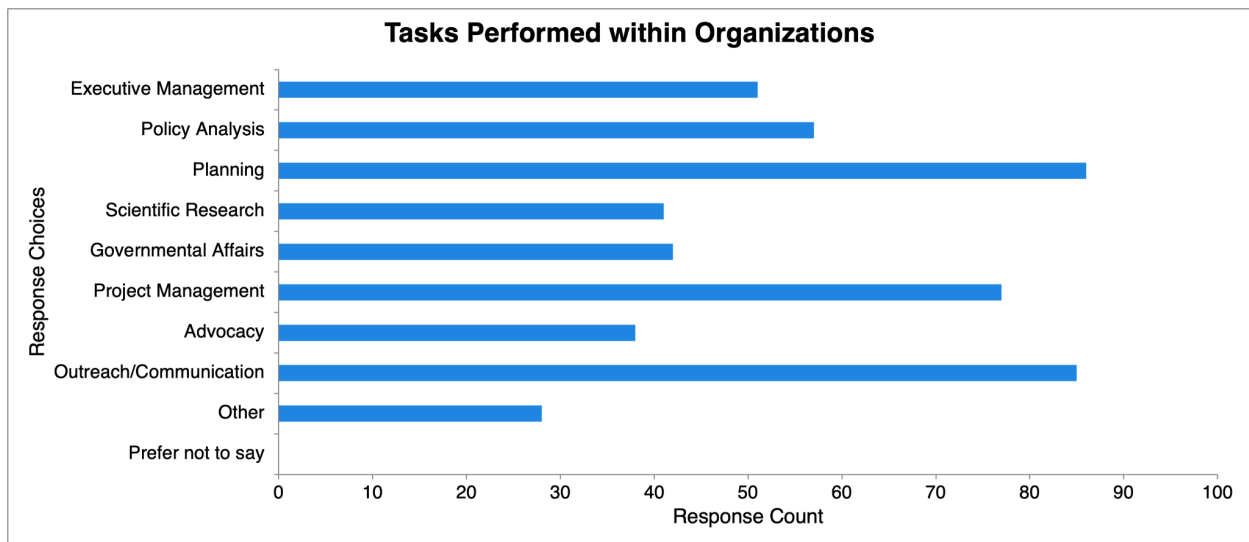


Figure 11. Respondents by Task

Q6: *What tasks do you perform within your organization? (Check all that apply)*

The two most frequent tasks performed by respondents are planning and outreach/communication, with 56% of respondents selecting at least one of those choices. Other tasks listed as performed include teaching, weather and tide forecasting, and engineering.

Q8: *What part of the tri-county does your organization work on? (Check all that apply)*

Most respondents indicate their organizations work countywide and or within the City of Charleston. Charleston county is the top answer, accounting for 12% of total selections and 46% of all participants. Approximately one third of participants are involved within Berkeley and or Dorchester counties.

Perceptions of Sea-level Rise in the Tri-County Area

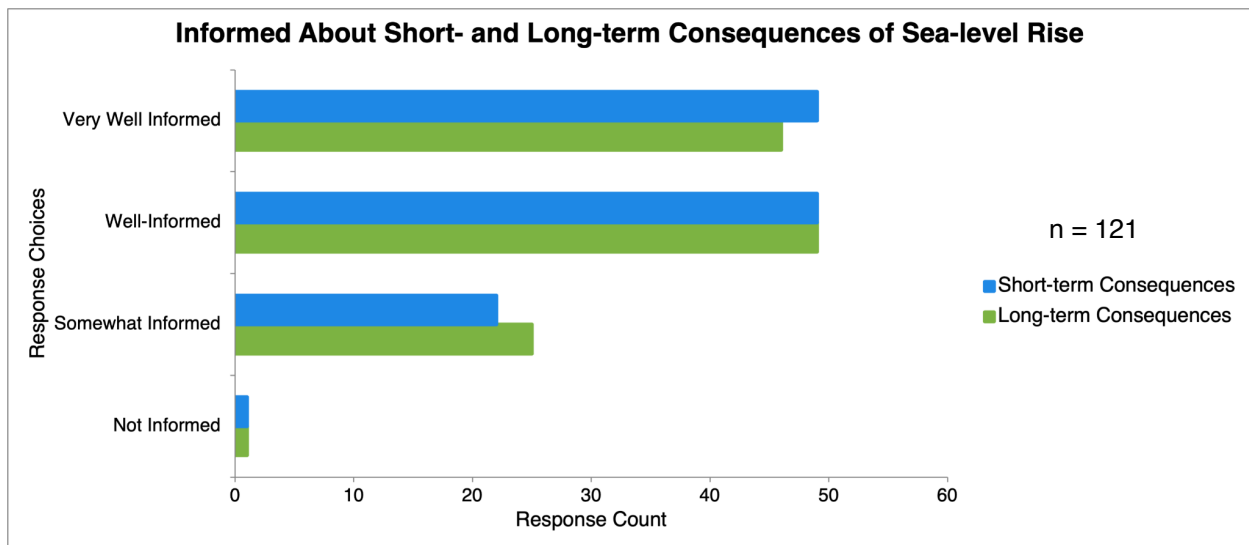


Figure 12. Short- and Long-term Consequences of Sea-level Rise

Q9: *How informed do you feel about the short-term and long-term consequences of sea-level rise in the tri-county area?*

Most participants feel at least well-informed about short-term and long-term consequences of sea-level rise in the tri-county area. However, slightly less individuals indicate they feel very well-informed about long-term consequences.

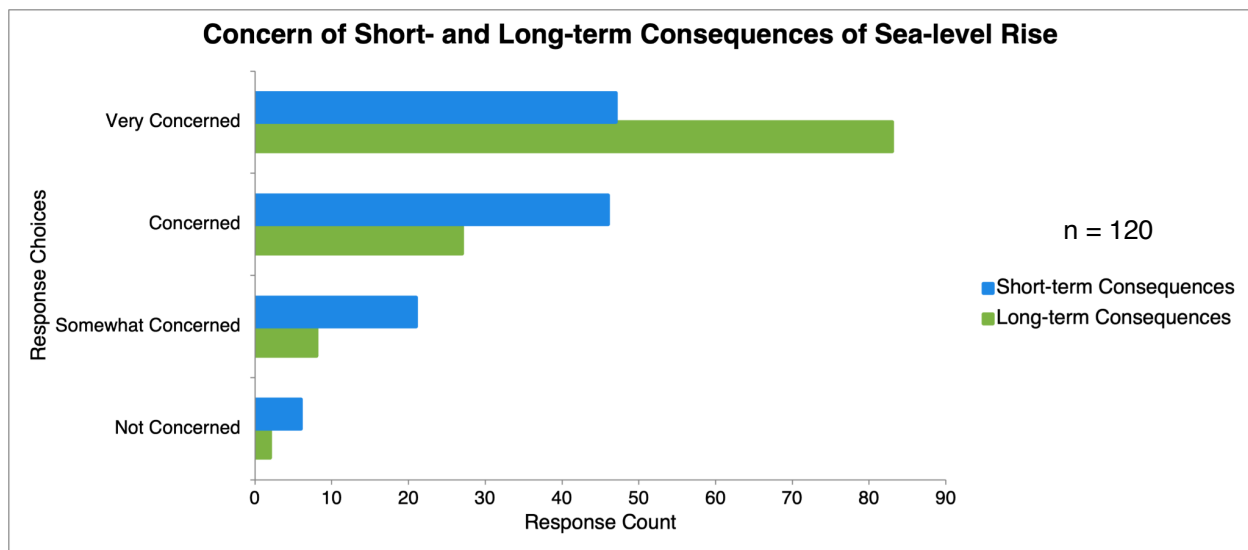


Figure 13. Concern of Short- and Long-term Consequences of Sea-level Rise

Q10: *How concerned do you feel about the short-term and long-term consequences of sea-level rise in the tri-county area?*

However, a majority of participants feel somewhat concerned about short-term consequences of sea-level rise in the tri-county area. 69% of respondents are very concerned about long-term consequences.

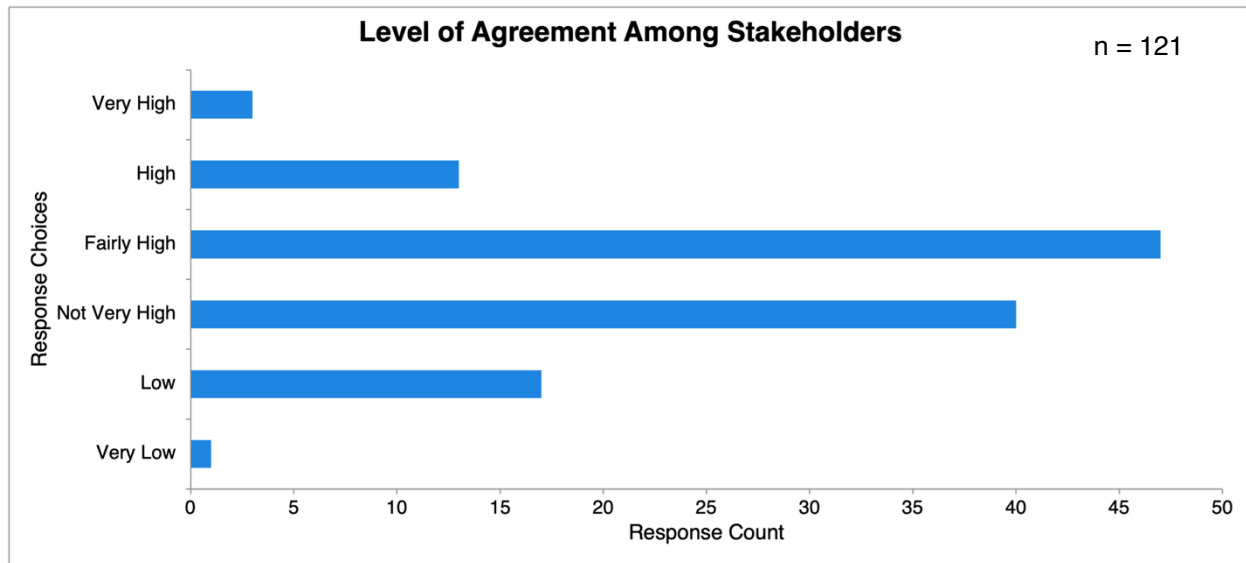


Figure 14. Perceptions of Agreement Between Sea-level Rise Stakeholders

Q11: *Based on your own experience, how would you rate the level of agreement among stakeholders (including policymakers, private sector, community organizations, etc.) concerning the risks posed by sea-level rise in the tri-county area?*

While a majority of respondents believe that tri-county stakeholders agree, in some capacity, about the risk of sea-level rise in the area, the top answers were “Fairly high” and “Not very high”, explaining that perceptions are mixed.

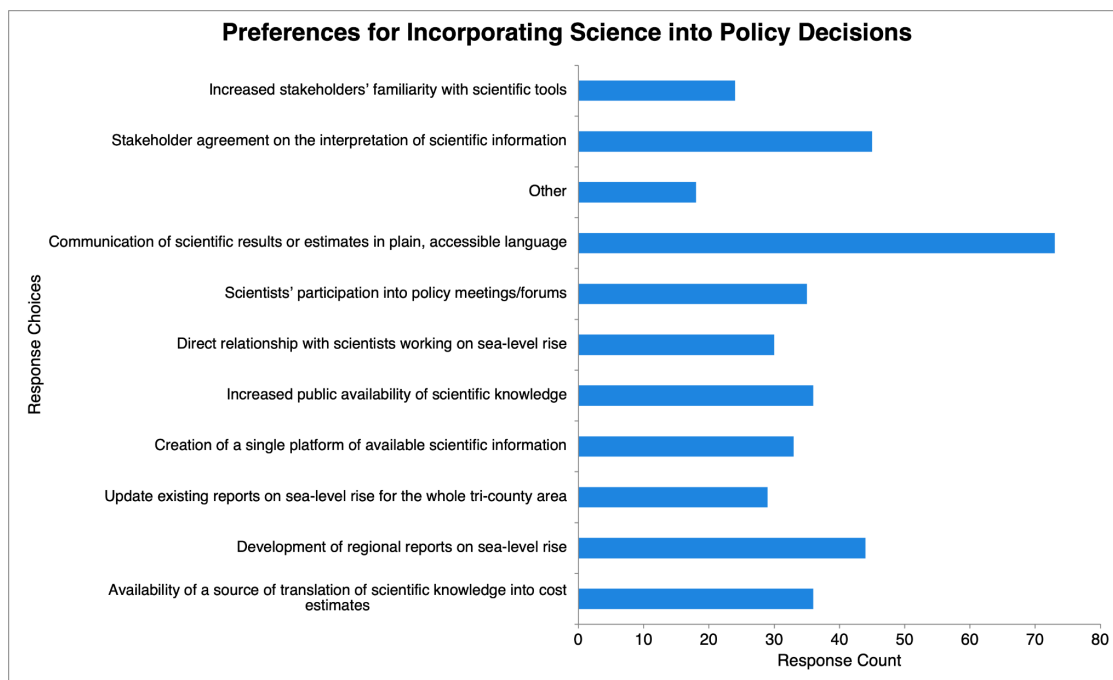


Figure 15. Preferences for Incorporating Science into Policy Decisions

Q12: *Please select from the list below (in your opinion), the three main factors that facilitate/would facilitate the incorporation of the best available science concerning sea-level rise into policy decisions?*

By far, the top response was “communication of scientific results or estimates in plain, accessible language” with 73 selections. The next top two selections were “development of regional reports on sea-level rise” and “stakeholder agreement on the interpretation of scientific information.” Themes from the “other” comments include lack of practical solutions/pathways to action, local disvalue of scientific information, and missing cost estimates.

Q13: *How many different sources of scientific information (e.g. reports, databases, consultancies, research centers) concerning sea-level rise do you rely upon for performing your job tasks?*

In general, there were a wide range of replies to the number of scientific information sources participants rely upon for performing job tasks. Many answers cited only two or three main sources as references, while about half responded that there were too many sources to name. Of the specific sources stated, reports and research from NOAA, USGS, IPCC, Sea Grant, and U.S. Army Corps of Engineers were frequently mentioned. Additionally, participants often mentioned using comprehensive plans, National Climate Assessments, and peer-reviewed publications.

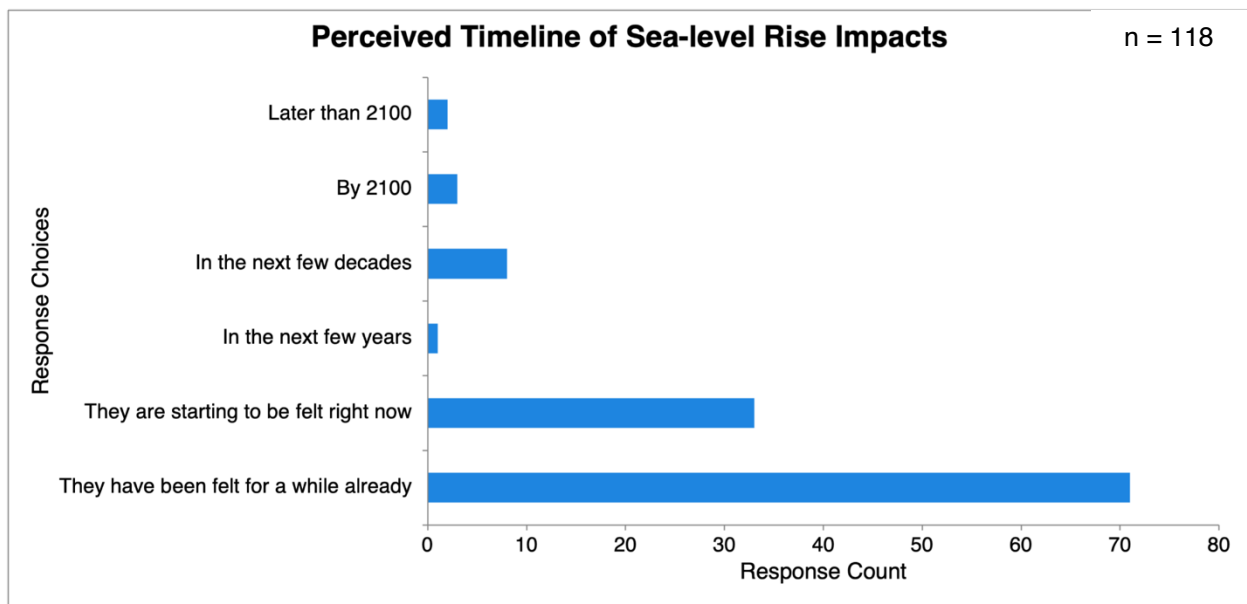


Figure 16. Perceived Timeline of Sea-level Rise Impacts

Q14: *How soon do you think the impacts of sea-level rise (e.g. frequent flooding and associated disruptions) will be felt in the tri-county area?*

47% of respondents chose that they believed impacts of sea-level rise in the tri-county area have already been felt for a while, while 22% believe they are starting to be felt right now. The remaining 31% of respondents selected choices that indicate they do not believe impacts have been felt yet locally. 33 chose not to respond.

Table 1. Ranking Sectors of Concern (n = 114)

Sector	Ranking Average	Percentage of Participants with Selection in Top 3
Transportation Infrastructure	3.68	56%
Waste and Stormwater Infrastructure	4.01	49%
Water Supply Infrastructure	5.36	34%
Ecosystems Health	5.49	33%
Coastlines	5.57	38%
Historically Underserved Communities	6.01	31%
Public Health	7.54	22%
Energy Infrastructure	7.61	5%
Availability of Housing	8.61	11%
Affordability of Housing	8.81	8%
Property Values	8.91	5%
Economic Growth	9.86	3%
Commercial Developments	10.37	2%

Q15: *Sea-level rise will affect several types of infrastructure as well as communities. From the list below, please rank the items or sectors in the order that you are most concerned about.*

Sea-level rise will affect several types of infrastructure as well as communities.

Respondents were asked to rank fourteen items/sectors in their order of concern, shown in Table

1. Of 114 responses, transportation infrastructure averaged the lowest ranking, with a ranking average of 3.68 and 56% of participants selecting it in their top three. Waste and stormwater infrastructure was a close second choice, with a ranking average of 4.01 and 49% selecting it in their top three. Water supply infrastructure, ecosystems health, and coastlines followed.

Overwhelmingly, economic growth and commercial developments were of the lowest concern.

Additionally, several participants noted they were concerned about worsening emergency system accessibility and response times.

Table 2. Ranking Preferences for Policy Prioritization (n = 110)

Sea-level Rise Policy	Ranking Average	Percentage of Participants with Selection in Top 3
Create a regional sea-level rise adaptation plan for Charleston, Berkeley, and Dorchester counties	3.55	64%
Complete vulnerability assessments for the three counties as soon as possible	3.61	62%
Promote projects aimed at accommodating sea-level rise with “green” infrastructure	5.83	26%
Develop faster/more efficient permitting processes that incorporate considerations of sea-level rise	6.37	17%
Create a single information platform concerning	6.37	19%

the status of projects related to sea-level rise in the Charleston area, cost projections, and scenarios		
Promote projects with different or innovative design solutions	6.75	13%
Pass a tax measure at the local/county/state level to address sea-level rise	6.83	21%
Create a collaborative partnership of existing regional agencies to address sea-level rise in the area	7.1	25%
Focus attention on the impact of sea-level rise on historically underserved communities in the area	7.09	15%
Empower an existing regional authority to address sea-level rise in the area	8.75	13%
Support local jurisdictions to respond to sea-level rise threats as they see fit	9	7%
Establish a new regional authority to address sea-level rise in the area	9.14	10%
Build a seawall	11.17	5%

Q16: *Please rank the following possible sea-level rise policies in the tri-county area in order of your preference for prioritization.*

Additionally, participants ranked their preferences for 13 possible sea-level rise policies in the tri-county area. Table 2 illustrates the 110 collected responses. Participants consider creating a regional sea-level rise adaptation plan for Charleston, Berkeley, and Dorchester counties and completing vulnerability assessments for the three counties as soon as possible as the two priority actions. Both were in more than 60% of participants' top three selections. By far,

the least preferable option was “build a seawall” with a ranking average of 11.17. Other policy action preferences included developing a long-term plan for retreat away from the coastline and enacting policies to preserve ecosystem services and green infrastructure from development pressures.

Organizational Participation in Sea-level Rise in the Tri-County Area



Figure 17. Collaborative Activities

Q17: In the past year, which of the following collaborative activities did you/your organization engage in as part of your work on sea-level rise in the tri-county area? (Check all that apply)

The top collaborative activities reported by respondents were “sharing information with other organizations” and “engaging in joint planning with other organizations”. Around one third

of participants indicated that they implemented projects, prepared grant/funding proposals, and or organized meetings jointly with other organizations. Less than ten individuals denied engaging in any collaborative activity in the past year.



Figure 18. Barriers to Collaboration

Q18: *In the past year, which of the following have represented barriers to your organization's working collaboratively with other organizations in sea-level rise in the tri-county area? (Check all that apply)*

By far, the top barrier identified by respondents was scarce budgetary/staff resources, which received 69 selections, nearly 19% of the total selections. Next, with 42 selections, was the lack of political leadership of elected officials. The following barriers were the lack of an overarching plan and lack of public support for policies addressing sea-level rise. The lowest response was for lack of availability of adequate scientific information, which only received eight selections.

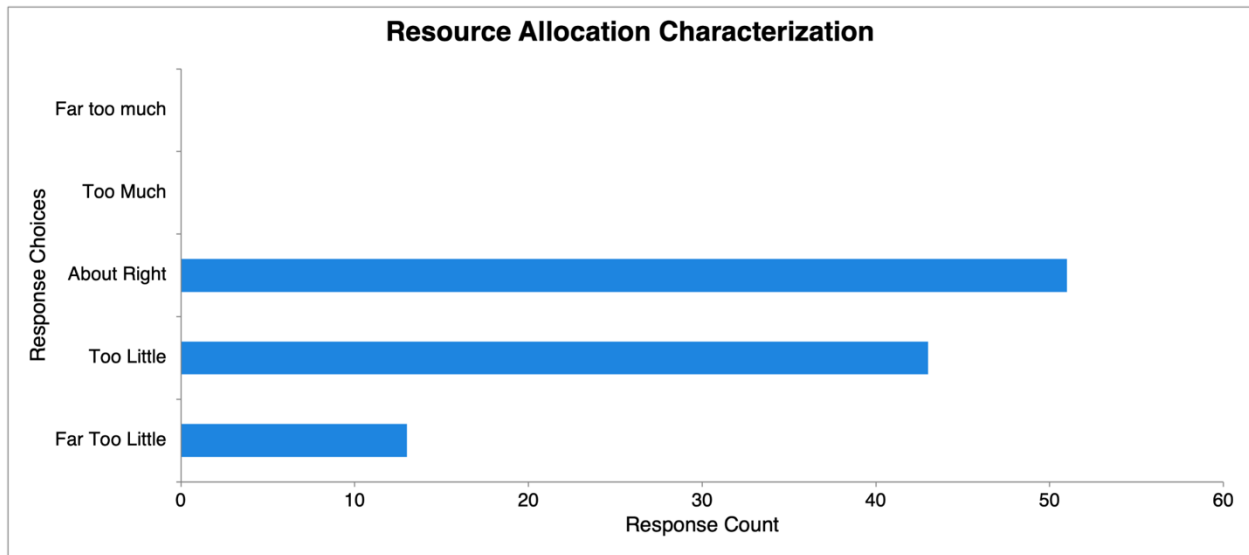


Figure 19. Resource Allocation Characterization

Q19: *How would you characterize the amount of resources (i.e. staff and/or funds) your organizations has devoted to sea-level rise in the tri-county area in the past year?*

48% of participants characterize the amount of resources (i.e., staff and/or funds) their organizations have devoted to sea-level rise in the past year as “about right”. The remaining 52% believe “too little” or “far too little” resources have been allocated.

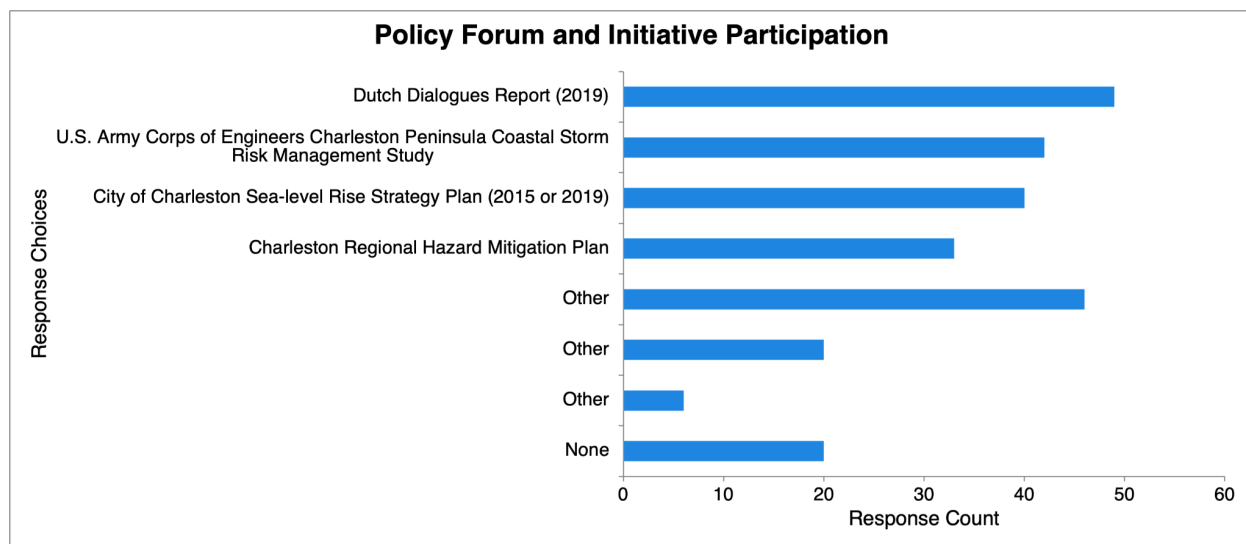


Figure 20. Policy Forum and Initiative Participation

Q20: *Sea-level rise issues can be addressed in different kinds of policy forums, planning processes, and initiatives (i.e. Dutch Dialogues; U.S. Army Corps of Engineers Charleston Peninsula Coastal Storm Risk Management Study; City of Charleston Sea-level Strategy Plan etc.) where stakeholders and authorities deliberate and make decisions about programs, policies, permits, projects, and funding.*

Most respondents reported they participated in at least one forum or initiative. Overall, eleven participated in all four studies/reports, with most of them affiliating with the City of Charleston. Other affiliations included Historic Charleston Foundation, Coastal Conservation League, Charleston Trident Association of Realtors, and South Carolina Sea Grant Consortium. 17 individuals participated in three of the four, while 27 participated in two of four. 20 participants indicated they were not involved in any policy forums or planning initiatives. Perceptions of participation experience in these forums, processes, and initiatives are expanded below.

DUTCH DIALOGUES:

Of the 151 total survey respondents, 49 indicated that they participated in the Dutch Dialogues report. While the average response gave the Dutch Dialogues a seven for impact on organizational goals, the most frequent answer was a five. The lowest selection was a four. There was general agreement that the goals of all involved organizations were considered during the process and that the initiative has led to tangible progress in preparing for sea-level rise. Similarly, most respondents ‘somewhat agreed’ that participation in the Dutch Dialogues has led to tangible progress in preparing for sea-level rise. Averaging a 6.8 for fairness in decision-making, a ‘5’ was the most common grade given the Dutch Dialogues report. 40% of Dutch

Dialogues participants selected the following in regards to the decision-making process for the report: “For most decisions in this initiative, most groups can benefit as long as they can develop a common policy.” The top barrier to cooperation in the Dutch Dialogues report was identified as “Initiative lacks authority to produce binding decisions,” which received 31% of the selections. Secondly, “the process was controlled by a few dominant stakeholders” received 20%. The least selected choices were “There is too much scientific uncertainty” and “Participants were not trustworthy.”

US ARMY CORPS OF ENGINEERS CHARLESTON PENINSULA COASTAL STORM RISK MANAGEMENT STUDY:

The U.S. Army Corps of Engineers Charleston Peninsula Coastal Storm Risk Management Study involved 42 respondents. The study averaged a ‘6’ for impact on organizational goals, while a ‘5’ was the top answer. Five respondents reported a number lower than five. Of the 34 responses to the following question, responses were spread across each answer choice: “In regards to the U.S. Army Corps of Engineers Charleston Peninsula Coastal Storm Risk Management Study initiative, the goals of all involved organizations are taken into account.” Again, respondents do not agree on whether tangible progress in preparing for sea-level rise has been made due to participation in the U.S. Army Corps of Engineers Charleston Peninsula Coastal Storm Risk Management Study. 42% somewhat agree, while 30% somewhat disagree. The average “fairness” of the initiative rating made by respondents was a five, but 13 selected less than five while 14 chose greater than five. Similarly, participants do not agree on the benefits of the study’s decision-making process. Top barriers to cooperation in the study include “The process is controlled by a few dominant stakeholders” with 24% of responses,

“participants do not share common views” with 21%, and “the procedures are confusing” with 13%. Notable comments regarding the study include: “Bureaucratic procedures and processes were difficult for many to participate in, especially during COVID. Lots of voices excluded from the process” and “Widespread public misunderstanding, political disagreement on goals, uncertainty over ultimate funding”.

CITY OF CHARLESTON SEA-LEVEL RISE STRATEGY PLAN (2015 OR 2019):

40 individuals noted their participation in the City of Charleston Sea-level Rise Strategy Plan, either in the 2015 or 2019 version. Perceived impact of the City of Charleston Sea-level Rise Strategy Plan (2015 or 2019) received mostly positive feedback, averaging a 6.84. The responses to whether goals of all involved organizations were taken into account were also overwhelmingly positive, with 86% selecting either “somewhat agree” or “strongly agree.” Similarly, 81% chose “somewhat agree” or “strongly agree” for whether they believe participation in the City of Charleston Sea-level Rise Strategy Plan (2015 or 2019) has led to tangible progress in preparing for sea-level rise. 95% rated perceived fairness of the decision-making process for the report a five or above. 75% of respondents agreed that most groups can benefit from the decision-making processes, but there is disagreement about whether all groups or a selected few will benefit. The top barriers to cooperation indicated by respondents included: “Participants do not share common views” with 21%, “The process is controlled by a few dominant stakeholders” with 16%, and “Lack of resources” with 15%.

CHARLESTON REGIONAL HAZARD MITIGATION PLAN:

Of the 32 participants, almost all declared that the Charleston Regional Hazard Mitigation Plan positively contributed to their organization's goals. Additionally, all participants with the exception of one responded "somewhat agree" or "strongly agree" for "the goals of all involved organizations are taken into account." Further, 78% have a level of agreement that the Charleston Regional Hazard Mitigation Plan has led to tangible progress in preparing for sea-level rise. In rating fairness of the process for decision-making in the Charleston Regional Hazard Mitigation Plan, responses averaged a 7.6., with all responses rating a five or above. All agreed that most groups in the decision-making process could benefit from the initiative. The top barriers to cooperation identified for the Charleston Regional Hazard Mitigation Plan was "Participants don't attend meetings often enough", "The process is controlled by a few dominant stakeholders", and "The initiative lacks authority to produce binding decisions," each receiving roughly 15% of the responses. Comments note that the plan, while regional, is essentially a collection of each municipality's individual plan, thus limiting the production of a collective plan from the process.

Measuring Current Collaboration Between Organizations

Q21: *From the following categories, please list the organizations, separated by a comma, that you have collaborated most closely with in the context of sea-level rise planning during the past year.*

Participants were asked to list organizations they have collaborated closely with in the context of sea-level rise planning during the past year. 25 respondents did not disclose their

organizational affiliation and collaboration. The top responses by category are: City of Charleston (local government), NOAA (federal government), SCDNR (state government), and Coastal Conservation League (NGO/Other). Each of the following organizations received more than 20 mentions: City of Charleston, NOAA, S.C. Department of Natural Resources, Charleston County, S.C. Department of Health and Environmental Control, U.S. Army Corps of Engineers, S.C. Office of Resilience, and S.C. Sea Grant Consortium.

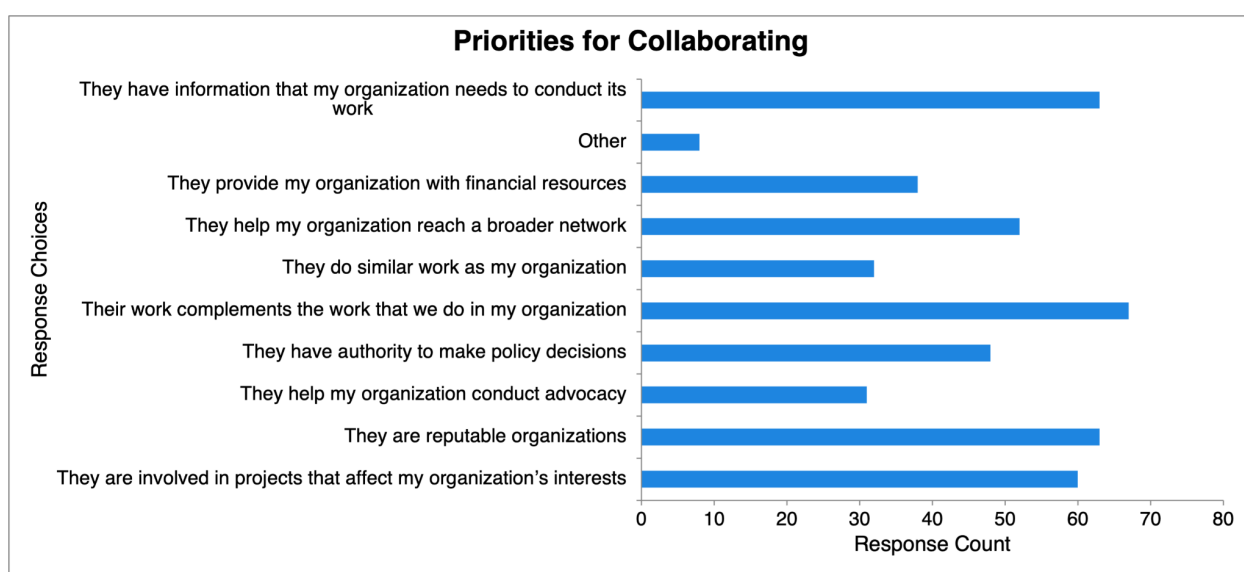


Figure 21. Priorities for Collaborating

Q22: *When choosing organizations to collaborate with, which of the following factors do you consider important? (Check all that apply)*

Respondents consider a number of factors when choosing organizations to collaborate with; the top four choices were close in selections. Overall, respondents seem to generally value reputable information exchange and complementary resource or informational support when considering collaborative potential between organizations.

Q23: *Are there any organizations that you would like to collaborate with, but do not at present?*

If yes, please list them.

Respondents were also asked about agencies and organizations they would like to collaborate with, but do not at present. The majority of organizations mentioned in this section were state and federal agencies, along with local governments. The most frequent are as follows: National Oceanic and Atmospheric Administration (NOAA), Federal Emergency Management Agency (FEMA), United States Army Corps of Engineers (USACE), South Carolina Office of Resilience (SCOR), South Carolina Department of Health and Environmental Control – Office of Coastal Resource Management (SCDHEC-OCRM), South Carolina Department of Natural Resources (SCDNR), South Carolina Department of Transportation (SCDOT), and Berkeley-Charleston-Dorchester Council of Governments (BCDCOG).

Charleston Peninsula Seawall Perceptions and Support

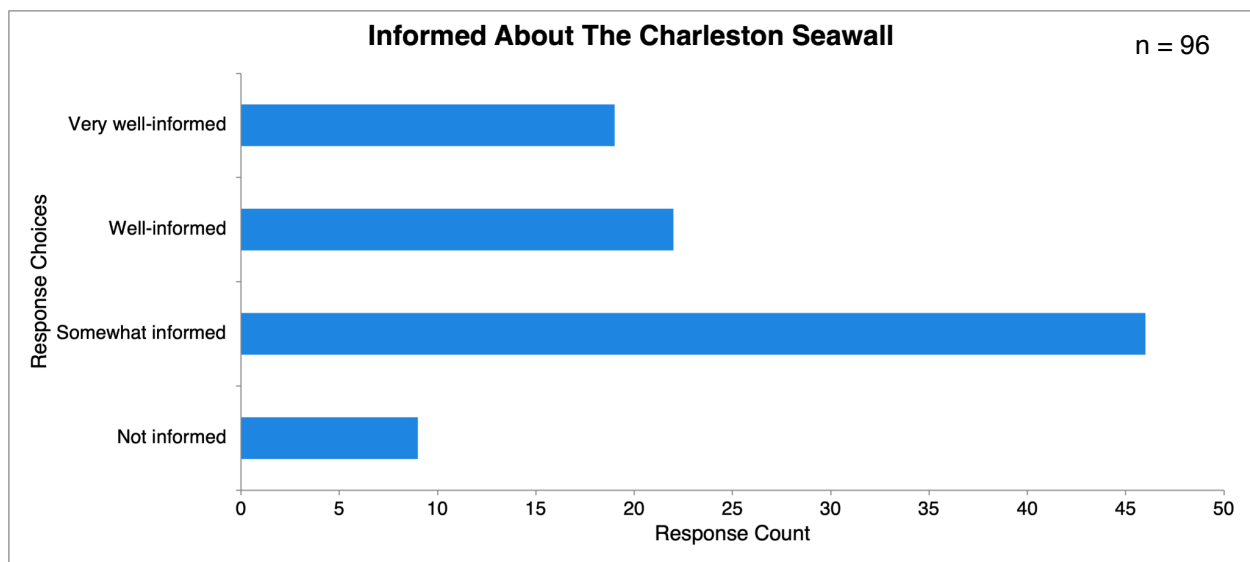


Figure 22. Seawall Project (Informed)

Q: *As you may know, the US Army Corps of Engineers is developing plans for a seawall on the Charleston peninsula. How informed do you feel about the Charleston seawall project?*

This question only received 96 responses, but the majority of participants selected that they feel only somewhat informed about the Charleston seawall project (48%).

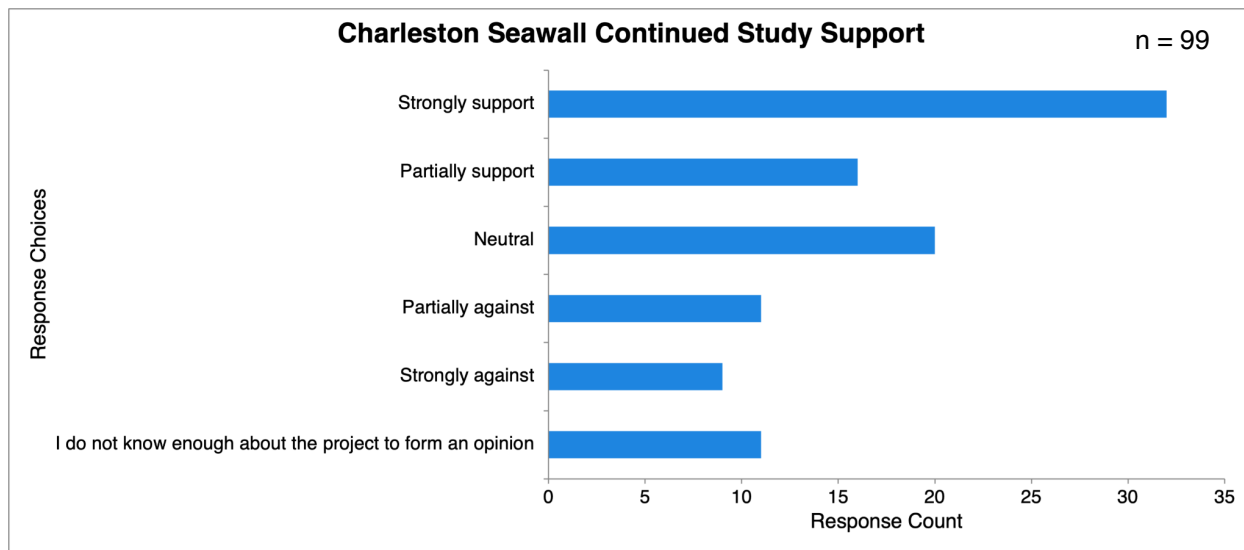


Figure 23. Support for Continued Study of Charleston Peninsula Seawall

Q24: *Do you support continued study regarding the Charleston seawall project?*

Overall, 48% of respondents express at least partial support for continued study for the Charleston seawall project, while 20% are at least partially against it. 20% report neutrality regarding continued study.

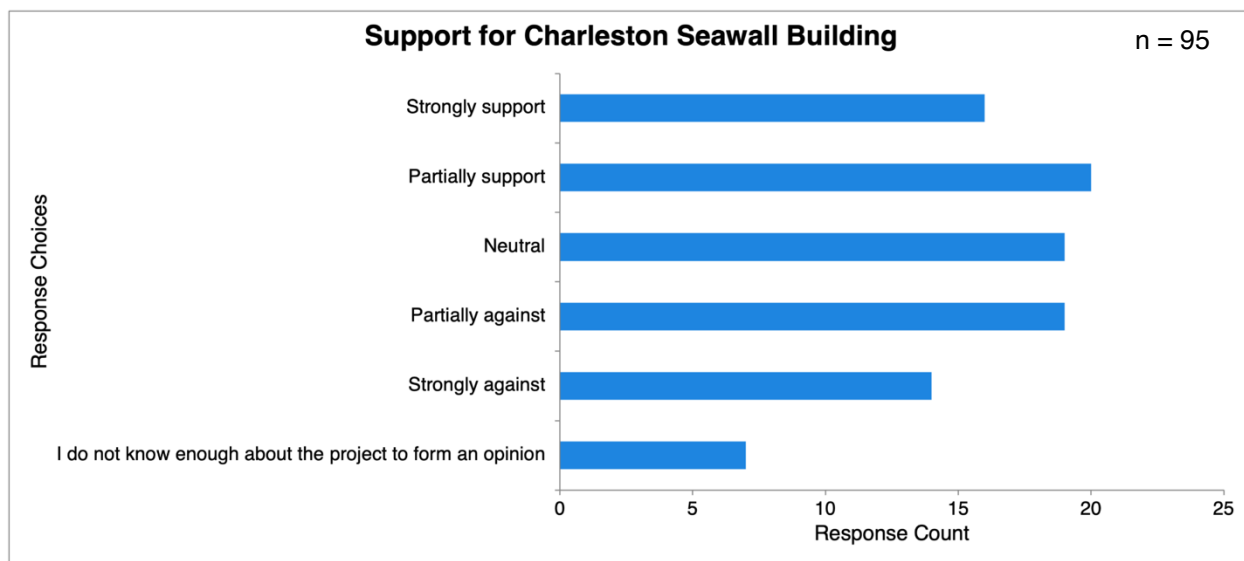


Figure 24. Support for Building the Proposed Charleston Peninsula Seawall

Q: *At this time, do you support building a seawall on the Charleston peninsula?*

However, 38% of respondents express at least partial support for building a seawall on the Charleston peninsula, while 35% are at least partially against it. Once again, 20% report neutrality, while 7% do not have enough knowledge for an opinion.

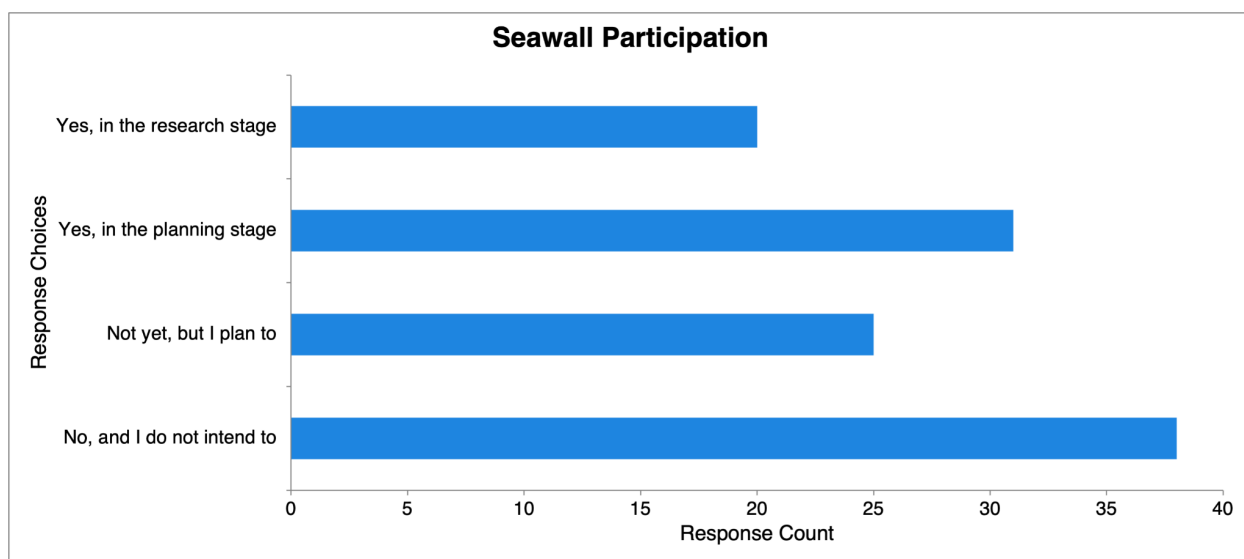


Figure 25. Participation in Charleston Peninsula Seawall Project

Q25: *Have you participated in the seawall project in any capacity? (Select all that apply)*

Of the 114 responses, one third of respondents do not intend to participate in the seawall project. 45% of respondents have participated, in the research or planning stage, or both.

CHAPTER 5

DISCUSSION/CONCLUSIONS

A rising sea-level in the tri-county area is requiring planning and action from stakeholders and decision-makers to prepare and adapt to changing conditions. To preserve the area's ecosystems, economy, and residential lifestyle, collaboration and cooperation across the network is necessary. Through this research, a broad sample of policy actors in the region shared their personal perceptions of sea-level rise and organizational role in planning, preferences for policy action, and involvement in current and recent forums and initiatives. Overall, perceptions of stakeholder agreement are highly mixed, with variation occurring across sectors and even within the same organization.

The respondents in this study represent a wide range of organizations, sea-level rise involvement, and levels of governance across Charleston, Berkeley, and Dorchester counties. The largest category of stakeholders represented is local government, reflecting the majority of the municipalities within the study area.

While most participants agree that impacts from sea-level rise have either already been felt for a while or are beginning to be felt now, there are a few surprising outliers who do not perceive risks associated with sea-level rise until 2100 or beyond. Additionally, the majority of participants agree on a high level of concern for both short- and long-term consequences of sea-

level rise. Vulnerability of stormwater infrastructure and waste/stormwater infrastructure to sea-level rise are of top concern for participants. Water supply infrastructure, ecosystems health, and coastlines are also ranked high, indicating participants worry about the degradation of critical systems within the tri-county area.

The survey asked participants to select their preferred strategies for incorporating scientific information into policy decisions. Respondents noted the need for plain, accessible language when communicating scientific results along with the development of regional reports on sea-level rise. Additionally, participants identify discrepancies in interpretation of scientific information among stakeholders and decision-makers, which may be an existing barrier to moving forward in certain settings. When asked about potential sea-level rise policies, respondents express stronger prioritization in compiling information for a regional adaptation plan and or vulnerability assessments, over establishing authority to lead the effort. Preference was also given to promoting “green” infrastructure projects aimed at accommodating sea-level rise, as opposed to the building of a seawall. Therefore, results suggest stakeholders are aware of the risks posed by sea-level rise and share agreement that action is necessary, but vary in their engagement in collaborative activities at this time.

Level of collaboration among stakeholders greatly varies across each planning forum. Organizations most often collaborate through information exchange and project planning, with more formal activities such as signing a joint agreement are less frequent. Further collaboration is limited by various barriers, with scarce budgetary/staff resources as the most common barrier to collaboration indicated by participants. Nearly half of respondents felt their organization allocated less than the adequate amount of resources, either staff and or funds, towards sea-level rise efforts in the past year. A lack of resources was also a top cooperation barrier in the City of

Charleston Sea-level Rise Strategy Plan (2015 or 2019). However, barriers did not seem to significantly vary between types of organization throughout the venues.

Participants indicated their participation in sea-level rise policy forums, planning processes, and initiatives such as the Dutch Dialogues Report (2019), United States Army Corps of Engineers Charleston Peninsula Coastal Storm Risk Management Study, City of Charleston Sea-level Rise Strategy Plan (2015 or 2019), the Charleston Regional Hazard Mitigation Plan, and or others. Control of dominant stakeholders throughout the process was listed as a barrier to cooperation in all four of the listed studies. Additionally, lack of authority to produce binding decisions and lack of common views among stakeholders were also identified.

All of the top organizations that participants have collaborated mostly closely with in the context of sea-level rise planning during the past year are agencies of local, state, and federal government. City of Charleston, National Oceanic and Atmospheric Administration, South Carolina Department of Natural Resources, Charleston County, South Carolina Department of Health and Environmental Control, and United States Army Corps of Engineers were all highly mentioned. It is reported that non-profit and non-governmental organizations as well as consulting and research institutions are not collaborated with as often.

Of the 29 venues reviewed for this research, the most collaborative initiatives are the Charleston Resilience Network and the Dutch Dialogues report. Additionally, Berkeley-Charleston-Dorchester Council of Governments had the highest involvement in the venues and planning processes, followed by the City of Charleston and College of Charleston.

One proposed strategy to mitigate sea-level rise effects in the tri-county area is a seawall surrounding the Charleston peninsula. In this sample, knowledge about the proposed Charleston seawall project and support for continuation is highly mixed. Half of participants support

continued study, but only 38% support building the seawall at this time. Participants also had the option to share thoughts about the project. Comments cover a wide range of opinions and are included in Appendix E.

While some planning forums seem to have an emergence of collaboration, there are a select group of repeated stakeholders that drive many of the current sea-level rise efforts in the area. Concern among actors should also motivate the growth of collaborative activities. Similarly, the passion expressed in many of the comments regarding the proposed seawall project provide evidence that stakeholders are invested in the planning outcomes for their communities. Overall, there is more sea-level rise collaboration between government agencies than between other entities. The governance system is polycentric, however there are struggles to identify or balance leadership and to employ responsibility and accountability among current actors. Results show that there are multiple areas of communication that need improvement in order to effectively prepare for sea-level rise impacts and changing conditions on a regional scale, rather than at the individual level. Further stakeholder benefit could come from continued study and replication and expansion of this survey as sea-level rise planning efforts progress and change over the next months and years.

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Appendix A
Document Review and Venues

Document/Report	Year Published	Venue in Network Analysis?	Notes/Related Content
Berkeley-Charleston-Dorchester Council of Governments Regional Comprehensive Plan (Our Region, Our Plan)	2012	No	This regional plan discusses a vision for the tri-county area by the year 2040. It includes a segment about preserving the lowcountry's natural resources, and briefly mentions coastal hazards and the threat of sea-level rise. However, it is ten years old, so many components are not up to date.
Berkeley County Comprehensive Plan	In progress	No	Berkeley county is currently in the process of creating a new comprehensive plan, with the help of BCDCOG. The 2015 update to the previous comprehensive plan was reviewed, but did not incorporate sea-level rise.
Berkeley County Hazard Mitigation Plan*	2020	Yes	This county-wide plan discusses area hazards in depth, including sea-level rise. It also includes an action plan for each town/city within Berkeley county, as well as a vulnerability assessment and recommendations for implementation. However, the plan focuses on impacts from flooding associated with hurricanes and rainfall rather than sea-level rise.
Charleston Climate Action Plan	2021	Yes	Though the Climate Action Plan focuses on climate change as a whole and greenhouse gas

			emissions, it also discusses community resilience.
City of Charleston Comprehensive Plan*	2021	Yes	This thorough report details the importance of our area's natural resources, the concept of "living with water", and improving community resilience and equity. Sea-level rise and flooding are discussed.
Charleston County Comprehensive Plan	2018	Yes	This plan includes flooding, sea-level rise, rain and storm events, groundwater issues, and other hazards within the resilience section of the report, an element that was added in 2020.
Charleston Regional Hazard Mitigation Plan	2019	Yes	Among the many hazards outlined in this report, sea-level rise is considered a threat for every town/city in the county. Additionally, each town/city is individually assessed on their particular hazard vulnerability.
City of Charleston All Hazards Vulnerability and Risk Assessment	2020	Yes	This report approaches the selected hazards, including sea-level rise, through a lens of resilience, detailing specific risks linked to particular climate-related and non-climate-related stressors.
City of Charleston Sea-level Rise Strategy	2015	Yes	The first comprehensive report for approaching sea-level rise across several Charleston communities.
City of Charleston Flooding and Sea-level Rise Strategy	2019	Yes	Building on the 2015 report, the 2019 version incorporates flooding, accounting for new scientific data and threats from increased rainfall in the Charleston area.

City of Folly Beach Comprehensive Plan 5-Year Update	2021	Yes	Expanded from the 2017 comprehensive plan, this plan was updated to include recent SLR research and the new element of resilience, with tidal, rain, and stormwater flooding among the many topics.
City of Folly Beach Sea Level Rise Adaptation Report	2017	Yes	Beginning with a vulnerability assessment, the report then delves into each hazard and offers adaptation actions within the following categories: water infrastructure management, land management, education, transportation adaptation, and coordination/collaboration.
City of Goose Creek Comprehensive Plan	2021	No	Although this plan has a natural resources section, it does not discuss sea-level rise.
City of Hanahan Comprehensive Plan	2018	No	
City of North Charleston Comprehensive Plan	2020	Yes	This plan discusses climate and environmental hazards, including sea-level rise (though briefly), and the impacts they have on residents and their coastal lifestyle.
Dorchester County Comprehensive Plan	2018	Yes	Sea-level rise is mentioned in terms of protecting environmental resources and mitigating flooding.
Dorchester County Multi-Jurisdictional Hazard Mitigation Update	2020	Yes	First published in 2015, this report was updated in 2020. Although it does not explicitly discuss SLR, it looks at flooding, storm events, and other water-related hazard effects in the county and how to prepare for them.

Dutch Dialogues Report*	2019	Yes	A local and regional effort to evaluate hazard risks in the Charleston area, with consulting partners and experts from the Netherlands.
Town of Harleyville Comprehensive Plan	2020	No	
Town of James Island Comprehensive Plan and 5-Year Update	2021	No	Though the 5-year update in 2021 does mention sustaining natural resources, it does not explicitly discuss sea-level rise.
Town of Kiawah Island Comprehensive Plan	2015	Yes	
Town of Kiawah Island Flood Mitigation and Sea-level Rise Adaptation Report *	2018	Yes	
Town of McClellanville Comprehensive Plan	2022	Yes	Natural hazard planning is a top goal incorporated into this plan, with sea-level rise and resilience as topics of concern.
Town of Moncks Corner Comprehensive Plan	2017	No	
Town of Mount Pleasant Comprehensive Plan	2019	Yes	This plan includes a flooding vulnerability assessment and a hazard mitigation plan,
Town of Ravenel Comprehensive Plan	2020	No	Although this plan has a natural resources section, it does not discuss sea-level rise.
Town of Seabrook Island Comprehensive Plan*	2019	Yes	Within the natural resources element of this plan, hazards are described in depth - including SLR - and goals of planning for community resilience are included.
Town of Sullivan's Island Comprehensive Plan*	2018	Yes	This plan has an entire section dedicated to sea-level rise and

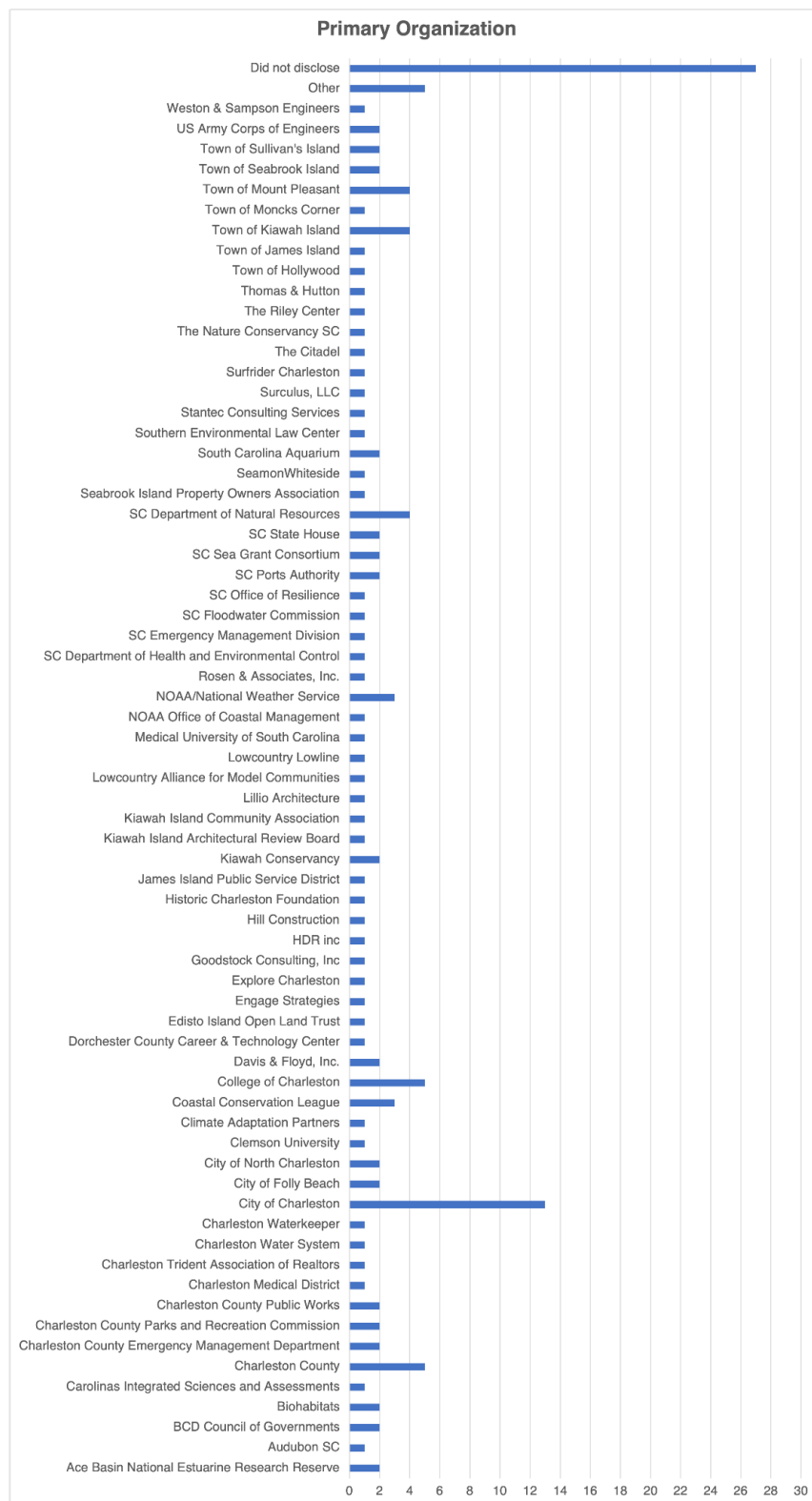
			resiliency. Within this section, the town's needs assessment is summarized, mapping and adaptation strategies are offered, and community outreach and collaboration are encouraged.
Town of Summerville Comprehensive Plan	2020	Yes	Summerville's plan groups natural resources, resiliency, parks, and open space together to present a series of recommendations to prepare for natural disasters and changing conditions.

Venue	Year Active	Related Content/Notes
Charleston Resilience Network Advisory Committee/Transition Board	?-Present	
Charleston Resilience Network Member	2014-Present	Over 400 individuals and organizations convene through CRN and exchange information by participation in events, outreach efforts, and strategic cooperation.
City of Charleston Resiliency and Sustainability Advisory Committee	2009-Present	This city committee has 13 voting members, each of which representing a different area of expertise. Several city council members and the mayor sit on this committee, along with technical experts, individuals in academia, and community members. The committee actively engages in planning meetings.
Charleston Seawall Project Public Comments	?	

City of Charleston's Army Corps of Engineers 3x3 Flood Protection Study Citizen and Business Advisory Committee	2021-Present	Created in 2021, this committee is responsible for advising city council and the mayor on recommendations relating to the USACE 3x3 Flood Protection Study, researching other cities' storm surge studies, considering proposed and alternative strategies, and extending communication to the community.
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Appendix B

Respondents' Primary Organizations



Appendix C
Complete Survey Questions

<i>Number</i>	<i>Question</i>	<i>Answer Choices</i>
1	Which of the following statements would best characterize your involvement with sea-level rise issues in the tri-county area (within Charleston, Berkeley, Dorchester counties)?	• No involvement • A part of my work, with occasional involvement • A part of my work, with routine involvement • A major aspect of my work for less than a year • A major aspect of my work for 1-5 years • A major aspect of my work for more than 5 years
2	Is your involvement in sea-level rise-related issues done on behalf of an organization you represent or work for?	• No, I am involved on my own • Yes, I am involved on behalf of one organization • Yes, I am involved on behalf of several organizations
3	Please provide in the appropriate boxes below the formal name that fully identifies the primary organization you work for. If you are involved in more than one organization, please list them in order of your level of involvement.	Primary Organization: Secondary Organization: Third Organization: Other:
4	Please choose the category or categories that best describe your primary organization (check all that apply):	• Federal government • State government • Regional government • Local government (cities, counties) • Non-profit/Non-governmental Organization • Consulting/Research • Education/Academic Institution • Multi-stakeholder Group • Infrastructure • Other
5	What is your official job title?	
6	What tasks do you perform within your organization? (Check all that	• Executive Management • Policy analysis

	apply)	● Planning ● Scientific Research ● Governmental Affairs ● Project Management ● Advocacy ● Outreach/Communication ● Other ● Prefer not to say
7	In the past two years, have you been employed by/affiliated with any organizations other than your primary organization working on sea-level rise? If yes, please list them here.	
8	What part of the tri-county does your organization work on? (Check all that apply)	● All of Berkeley County ● All of Charleston County ● All of Dorchester County ● List of all municipalities and unincorporated towns/cities within the tri-county area
9	How informed do you feel about the short-term and long-term consequences of sea-level rise in the tri-county area?	● Not informed ● Somewhat informed ● Well-informed ● Very informed
10	How concerned do you feel about the short-term and long-term consequences of sea-level rise in the tri-county area?	● Not concerned ● Somewhat concerned ● Concerned ● Very Concerned
11	Based on your own experience, how would you rate the level of agreement among stakeholders (including policymakers, private sector, community organizations, etc.) concerning the risks posed by sea-level rise in the tri-county area?	● Very high ● High ● Fairly High ● Not very high ● Low
12	Please select from the list below (in your opinion), the three main factors that facilitate/would facilitate the incorporation of the best available science concerning sea-level rise into policy decisions?	● Increased stakeholders' familiarity with scientific tools ● Communication of scientific results or estimates in plain, accessible language ● Scientists' participation into policy meetings/forums ● Direct relationship with scientists working

		- on sea-level rise - Increased public availability of scientific knowledge - Creation of a single platform of available scientific information - Update existing reports on sea-level rise for the whole tri-county area - Development of regional reports on sea-level rise - Availability of a source of translation of scientific knowledge into cost estimates - Stakeholder agreement on interpretation of scientific information - Other: _____
13	How many different sources of scientific information (e.g. reports, databases, consultancies, research centers) concerning sea-level rise do you rely upon for performing your job tasks?	
14	How soon do you think the impacts of sea-level rise (e.g. frequent flooding and associated disruptions) will be felt in the tri-county area?	- Later than 2100 - By 2100 - In the next few decades - In the next few years - They are starting to be felt right now - They have been felt for a while already
15	Sea-level rise will affect several types of infrastructure as well as communities. From the list below, please rank the items or sectors in the order that you are most concerned about.	- Transportation infrastructure - Water supply infrastructure - Waste and Stormwater infrastructure - Energy infrastructure - Ecosystems health - Coastlines - Commercial developments - Historically underserved communities - Economic growth - Property values - Availability of housing - Affordability of housing - Public health - Other:
16	Please rank the following possible	Create a regional sea-level rise adaptation

	sea-level rise policies in the tri-county area in order of your preference for prioritization.	plan for Charleston, Berkeley, and Dorchester counties ● Complete vulnerability assessments for the three counties as soon as possible ● Pass a tax measure at the local/county/state level to address sea-level rise ● Develop faster/more efficient permitting processes that incorporate considerations of sea-level rise ● Create a single information platform concerning the status of projects related to sea-level rise in the Charleston area, cost projections, and scenarios ● Focus attention on the impact of sea-level rise on historically underserved communities in the area ● Promote projects aimed at accommodating sea-level rise with “green” infrastructure ● Promote projects with different or innovative design solutions ● Support local jurisdictions to respond to sea-level rise threats as they see fit ● Establish a new regional authority to address sea-level rise in the area ● Empower an existing regional authority to address sea-level rise in the area ● Create a collaborative partnership of existing regional agencies to address sea-level rise in the area ● Build a seawall ● Other: _____
17	In the past year, which of the following collaborative activities did you/your organization engage in as part of your work on sea-level rise in the tri-county area? (Check all that apply)	● Sharing information with other organizations ● Engaging in joint planning with other organizations ● Implementing project jointly with other organizations ● Training personnel from other organizations ● Sharing personnel with other organizations ● Carrying out research projects jointly with other organizations ● Preparing grant/funding proposals jointly with other organizations ● Organizing public meetings jointly with

		- other organizations ● Outreach activities regarding sea-level rise-related projects jointly with other organizations ● Publishing reports or other public available documents jointly with other organizations ● Signing a formal agreement with another organization ● Joining or supporting litigation or other judicial processes ● Carrying out advocacy activities jointly with other organizations ● Other: _____ ● Nothing
18	In the past year, which of the following have represented barriers to your organization's working collaboratively with other organizations in sea-level rise in the tri-county area? (Check all that apply)	● Scarce budgetary/staff resources ● Knowledge of staff ● Lack of experience collaborating with other organizations in the tri-county area ● Distrust among stakeholders ● Lack of political leadership of elected officials ● Uncertainty of the future extent of sea-level rise ● Uncertainty about how quickly sea-level rise will happen ● Lack of availability of adequate scientific information ● Lack of an overarching plan ● Lack of awareness about other organizations' activity ● Permitting obstacles ● Lack of public support for policies addressing sea-level rise ● Lack of relationships with community-based organizations ● Other: _____
19	How would you characterize the amount of resources (i.e. staff and/or funds) your organizations has devoted to sea-level rise in the tri-county area in the past year?	● Far too much ● Too much ● About right ● Too little ● Far too little
20	Sea-level rise issues can be addressed	● Dutch Dialogues Report (2019)

	in different kinds of policy forums, planning processes, and initiatives (i.e. Dutch Dialogues; U.S. Army Corps of Engineers Charleston Peninsula Coastal Storm Risk Management Study; City of Charleston Sea-level Strategy Plan etc.) where stakeholders and authorities deliberate and make decisions about programs, policies, permits, projects, and funding.	• U.S. Army Corps of Engineers Charleston Peninsula Coastal Storm Risk Management Study • City of Charleston Sea-level Rise Strategy Plan (2015 or 2019) • Charleston Regional Hazard Mitigation Plan • Other: _____ • Other: _____ • Other: _____ • None
20.1	On a scale of 0 to 10, where 0 is “major negative impact” and 10 is “major positive impact”, how would you describe the impact of the _____ on your organization’s goals?	Scale of 0 to 10
20.2	In regards to the _____ initiative, the goals of all involved organizations are taken into account.	• Strongly agree • Somewhat agree • Somewhat disagree • Strongly disagree • Don’t know
20.3	Participating in the _____ (as an individual or on behalf of an organization) has led to tangible progress in preparing for Sea Level Rise.	• Strongly agree • Somewhat agree • Somewhat disagree • Strongly disagree • Don’t know
20.4	On a scale from 0 to 10, where 0 is “very unfair” and 10 is “very fair”, how fair would you say that the process of reaching decisions in the _____ was for all stakeholders?	Scale of 0 to 10
20.5	Which of the following statements best characterize the decision-making processes from the selected initiative?	• For most decisions in this initiative, most groups can benefit as long as they can develop a common policy • Although most groups can benefit from most decisions, there is conflict over who will benefit the most • For most decisions, one group’s gain involves another group’s loss • Don’t know

20.6	From the list below, indicate the barriers to cooperation in the _____ process. (check all that apply)	● Participants didn't attend meetings often enough ● Participants did not share common views ● Participants were not trustworthy ● The time demands were too high ● The process was controlled by a few dominant stakeholders ● The initiative lacks authority to produce binding decisions ● The procedures were confusing ● There is too much scientific uncertainty ● Lack of resources ● There were no identifiable barriers ● Other: _____
21	From the following categories, please list the organizations, separated by a comma, that you have collaborated most closely with in the context of sea-level rise planning during the past year.	Federal governmental agencies: _____ State governmental agencies: _____ Local/regional governmental agencies: _____ Non-governmental stakeholders (including research institutions, citizen groups, private actors, and any other relevant stakeholders): _____
22	When choosing organizations to collaborate with, which of the following factors do you consider important? (Check all that apply)	● They have information that my organization needs to conduct its work ● They provide my organization with financial resources ● They help my organization reach a broader network ● They do similar work as my organization ● Their work complements the work that we do in my organization ● They have authority to make policy decisions ● They help my organization conduct advocacy ● They are reputable organizations ● They are involved in projects that affect my organization's interests ● Other: _____
23	Are there any organizations that you would like to collaborate with, but do not at present? If yes, please list them.	

24.1	As you may know, the US Army Corps of Engineers is developing plans for a seawall on the Charleston peninsula. How informed do you feel about the Charleston seawall project?	● Not informed ● Somewhat informed ● Well-informed ● Very well-informed
24.2	Do you support continued study regarding the Charleston seawall project?	● Strongly support ● Partially support ● Neutral ● Partially against ● Strongly against ● I do not know enough about the project to form an opinion
24.3	At this time, do you support building a seawall on the Charleston peninsula?	● Strongly support ● Partially support ● Neutral ● Partially against ● Strongly against ● I do not know enough about the project to form an opinion
26	You may explain your answer here (optional)	
25.1	Have you participated in the seawall project in any capacity? (Select all that apply)	● Yes, in the research stage ● Yes, in the planning stage ● Not yet, but I plan to ● No, and I do not intend to
25.2	Please share your views on the Charleston seawall project (optional)	
	If you have suggestions about other groups or individuals we should survey, please provide potential participant names/organizations below.	

Appendix D

Alternate Policy Forums Participated In (Question 20)

Category	Listed Venues
Studies/Reports	Statewide Risk Reduction and Resilience Plan South Atlantic Coastal Study (USACE) Rosemont Resilience Plan City of Charleston Stormwater Project Planning North Charleston Climate Adaptation Plan Groundwater Monitoring/Integrated Watershed Study
Committees	Charleston County Resilience Element Committee City of Charleston Technical Review Committee Johns Island Task Force James Island Intergovernmental Council
Forums	Center for Resilience Excellence - South Carolina
Other	Living Shorelines Permit South Carolina MyCoast Program Enough Pie's King Tide Charleston Medical District Planning Efforts South Atlantic Salt Marsh Initiative

Noted plans that were included as venues include: Charleston Climate Action Plan, Town of Kiawah Island Flood Mitigation and Sea-level Rise Adaptation Report, Berkeley County Hazard Mitigation Plan, City of Charleston Comprehensive Plan, Folly Beach Sea-level Rise Strategy, City of Charleston Resilience and Sustainability Committee, and Charleston Resilience Network.

Appendix E

Seawall Project Comments

Comments in Favor

(Federal Government)

Protecting Historic Charleston should be a priority for the residents in order to preserve the peninsula. The Seawall project is a collaborative effort between multiple agencies local, state and federal in order to protect the peninsula from sea Level Rise.

(Federal Government)

The wall protects from surge, the damage from which it can not be prevented by other means. It is only one part of a solution for Charleston - there are multiple sources of flooding that need to be addressed by multiple solution

(Consulting/Research)

The City needs to develop a strategy to fund 'betterments' for the project, but overall, it's a much needed project that needs to proceed incrementally; A needed project that needs federal authority to look beyond just the risks posed by future storm surge.

(State Government)

Some plans are good but there are gaps in how it can be achieved; They should use the top as a road instead of making it a wall with the road inside

(Local Government)

A sea wall is the only feasible option to protect such a low area that is battered by intense waves. This area is the economic engine of our City.

(Local Government)

We need to get into the Design Phase to design a structure that works for Charleston's aesthetics, functions, communities AND risks.

(Local Government)

If the peninsula is not protected, the economic viability of the entire area is in jeopardy and strategic retreat will be necessary for the entire area and not just certain areas

(Local Government)

As an engineer, the only way to preserve the historic nature of the Peninsula is to structurally protect it. Generally, I prefer a policy of Retreat, but that doesn't have much political will behind it; It's better than doing nothing. Any and all strategies are worthy of study and thought. If we can find a better way, let's do that, but right now, green projects aren't going to save 300 years of history.

(Local Government)

It is the only option to prevent the Peninsula from more high tide flooding and the catastrophic effects of a major surge event.

(Local Government)

Not the end all be all but is good for short term sea level rise management

(NGO)

I support the basic premise that peninsular Charleston must be protected from storm surge by manmade barrier. I also support the further exploration of design considerations that will permit waterfront accessibility, maintain aesthetics commensurate with Charleston's character, provide new amenities for public engagement, and promote green infrastructure.

(NGO)

Without it, combined with nature-based solutions, we will lose the City in the next major hurricane

(Other)

MUSC is in support of this project.

Comments Opposed

(Federal Government)

I don't think the seawall is a viable option. I think the expense is a hindrance for a city the size of Charleston and I think the seawall is too focused on the downtown peninsula area. I also think the seawall will actually produce negative impacts (increased water levels) in surrounding areas.

(Consulting/Research)

I believe there is room for more creative solutions (i.e. breakwaters); I would appreciate if there was a deeper dive into alternative strategies

(Consulting/Research)

There are other options than a seawall around the City that will have a lesser impact on the minority communities that typically get the short end of any adverse impacts; I think the Army Corps of Engineers and others in the City have made up their minds on the seawall and are not open to other options. It's very disappointing.

(State Government)

A seawall is a very expensive (and ultimately probably temporary) solution to a long-term problem of overdevelopment in hazardous areas. The peninsula is important to Charleston's economy, but we can't continue to build higher and higher seawalls forever. This feels like a distraction from the real long-term challenge; we should be focusing on building infrastructure that can withstand flooding and sea level rise, not trying to prevent it from getting in (for as long as it works).

(Local Government)

This will protect some high value assets and push water onto those with less resources. It will not be an ultimate solution. It will destroy part of the character that makes Charleston wonderful.

(Local Government)

I think "greener" options were not adequately investigated. Additionally, the wall fails the lower-income and historical black communities that exist on the peninsula. In my opinion, the massive houses on the battery (that no one lives in) don't need protection. That entire area should be converted to greenspace and permitted to flood. If people who own a 13 million dollar home want flood protection, they can pay for it themselves. The wall should serve those who can't afford to protect themselves. The houses on the battery were used for slave auctions- that isn't a history I feel we need to preserve. Not only that, but the seawall is so expensive and will take so long to construct that it's doubtful it will even be effective by the time it's complete. The seawall isn't the answer, in my opinion. Or at least, it has a lot of flaws.

(Local Government)

Too narrow of project scope and expensive in the broader context of adaptive management tools and solutions. Resources should be focused on more adaptive tools and strategies than grey infrastructure.

(Local Government)

waste of money, we need to move inland

(NGO)

Grey-infrastructure solutions are temporary and further reduce our ability to naturally adapt to changing coastal conditions. Incorporating green-infrastructure / nature-based solutions will enhance our ability to improve the resilience of our human AND wildlife communities to the threat of sea level rise; The City of Charleston needs to strongly consider better alternatives to addressing challenges to community resilience. Building a sea wall will produce more challenges and require extensive funding both initially and over a long period of time. Ultimately, the approach is incredibly unsustainable and only addresses a few issues faced by the wealthy residents living on the peninsula. It does not address the broader challenges surrounding the degradation of our natural resources or potential impacts on marginalized or low-income communities.

(NGO)

More needs to be done to understand the impacts of displaced storm energy to surrounding areas, such as James Island. Strongly prefer the use of natural infrastructure.

(NGO)

The proposed sea wall will not do anything to actually benefit the peninsula besides sinking billions of dollars into creating a false sense of security for people living behind the wall.

(NGO)

I believe that human intervention should not attempt to stop nature's course. Our community needs to be aware of island 'rollover'. All local development needs to conform to any new infrastructure based on island rollover, students in schools along the coast need to be taught island rollover and all existing infrastructure needs to be prepared and independently insured based on island rollover. South Carolina and Charleston was unable to stop the infrastructure from being lost due to Hugo. Now, island rollover and sea-level rise is easier to prepare for than Hurricane Hugo. And this is even easier to prepare for than a tornado that can take away all in a split instant.

College of Charleston (Education/Academic)

The seawall will protect to 14 ft elevation. Hugo, the "benchmark storm" pushed a 20-23ft storm surge about 25 miles north of Charleston. A similar storm, if it hit farther south, would overflow the seawall turning Charleston into a "bathtub" with catastrophic consequences; It is hubris in its most naked form. Use the money to help lower atmospheric carbon dioxide and protect disadvantaged people while also preparing for an organized retreat from the coast.

Charleston County Parks and Rec (Local Government)

I'm new to Charleston but have lived in other coastal cities and a seawall hasn't been the answer to their issues. It's putting a bandaid on the Hoover Dam

Neutral/Undecided Comments

Biohabitats (Consulting/Research)

A storm barrier is needed, not necessarily a wall. It should be based first on nature-based design principles; second it must be context sensitive to the city's urban fabric, and third, it needs to be inclusive and equitable to ALL communities potentially impacted by flooding. It also should be thoroughly embedded within an overall holistic water plan for the entire city, that takes into account stormwater runoff and groundwater intrusion.

Stantec Consulting Services (Consulting/Research)

I believe our options are limited now due to the level of development in Charleston. The existing sea wall wouldn't require additional impacts to waters of the US however long term I don't think that it is the best option. There are other options that should be considered. We should be "building WITH water and not against it" and follow practices similar to the Dutch Dialogues, daylighting culverts, reconstructing roadways, constructing bridges, no more filling of creeks/marsh, etc.

SC State House (State Government)

I would move forward with planning rather than reject the prospect of federal funding, but until the Army Corps recognizes intangible benefits and green solutions, this problem won't go away. It's 100% of a function of the Army Corps computer system.

Ace Basin NERR (State Government)

Although I do not believe the sea wall project is a long term solution, does not incorporate enough nature based solutions, nor do I believe it addresses flooding concerns for all at risk communities, I do

think that this is a potentially necessary short term fix. If this funding source from the army corps is not taken advantage of, the City Charleston could lack the funding necessary to protect itself from future sea level rise.

Ace Basin NERR (State Government)

It is hard to tell if this will actually solve flooding problems, or what problems it may create; It seems like a very expensive project that will lull people into complacency and allow more development in an extremely vulnerable location.

City of Charleston (Local Government)

The design must be appropriate and incorporate natural solutions where rational; There is a need for storm surge protection, but it must be done collaboratively and incorporate natural elements and preserve existing environmental assets

Town of Mount Pleasant (Local Government)

Seems like there could be other alternatives like those employed by Venice--gates at harbor, etc to limit flooding or other alternatives such a raising city/infrastructure such as Galveston, TX

Edisto Island Open Land Trust (NGO)

Given what I know of the geology of the peninsula and existing infrastructure, I believe increasing the height of the existing seawall and extending it will be unavoidable when trying to protect downtown Charleston. However, I hope green infrastructure will be implemented and utilized whenever feasible.

Southern Environmental Law Center (NGO)

I believe that the Corps needs to be incorporating more nature-based features into the project design. There are some places where a concrete seawall will make sense, such as near the port, but other areas where marshlands still exist and a softer approach to perimeter protection, such as a vegetated berm/horizontal levee, should be considered (see Sherwood report we commissioned with CCL).

College of Charleston (Education/Academic)

I am neutral at this point because there is insufficient information available on the design, construction, and most importantly, expected effects and likely collateral damage. Much more study needs to be done before I can make a rational decision; More analysis is necessary, especially concerning potential damaging as well as positive effects on low-wealth communities.

Davis & Floyd, Inc. (Other)

I believe in a hybrid of natural (plantings), "wall" like, such a berm, and a seawall. I created renderings for the City of Charleston back in 2018 & 2019 showing what I mean. I'm more than happy to send them your way. I think man has harmed our environment and a great solution would be using what is naturally provided and our man-made materials; It needs a hybrid of man-made and natural. Looking into more people with backgrounds of resiliency from both an engineering background and a landscape background. I can put you in touch with my firm since this is something I'm extremely passionate about

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