6 Priority Projects & Actions

Project Criteria

After the vulnerability assessment, a set of projects that mitigated identified hazards was assembled. The projects offer structural and non-structural hazard mitigation techniques that often address multiple hazards and have co-benefits that extend beyond resiliency. The potential projects listed in the following pages are listed with their description, objectives, and hazards that they address.

Project Prioritization

Project prioritization was based on a combination of project measures and public feedback. The projects were evaluation based on the following criteria in addition to being voted on by the public:

Prioritization Measures	
Cost-Benefit	**Low** – Benefits exceed cost in the short term (1 to 5 years); however, future sea level rise over the 30-year planning horizon may significantly decrease the project benefits **Medium** – Benefits entirety of the Town **High** – Benefits exceed cost in the short term (1 to 5 years) and continue to provide additional benefits over the 30-year planning horizon.
Social Equity	**Low** – Benefits are limited to location of project **Medium** – Benefits entirety of the Town **High** – Directly benefits vulnerable populations
Internal Capacity	Considers the capacity of town resources (staff effort, scheduling, funding)
Co-Benefits	Other benefits the project may bring that are not directly related to resiliency.

Project Prioritization

As part of the community engagement efforts in this planning process, the public was introduced to these non-structural and structural interventions at a public workshop. Following this meeting, the public was asked to further study the projects and rank them by priority. The following represents the priorities identified by the public. Although it is not a work plan or a mandate to implement these projects, this prioritization can inform decision-makers about the public's priorities should any of these projects be pursued further.

Non Structural Projects:

1. **Floodplain Management Plan**
2. **Estuarine Shoreline Management Plan**
3. **Open Space and Master Parks Plan.**

Structural Projects:

1.* Wastewater System Maintenance and Flood Mitigation

2.* Low Impact Development for Reduced Flooding and Enhanced Water Quality

3. Water System Maintenance and Flood Mitigation**

4.Stormwater System Maintenance and Retrofits**

5. Downtown Waterfront Bulkhead

6. Rachel Carson Reserve Bird Shoal Dune Stabilization

7. Front St. Green Infrastructure and Nature-Based Solutions

8. Cedar Street Waterfront Park

9. Gallant's Channel Living Shoreline

10. Stormwater outfall Retrofits

11. Historic Structure Mitigation and Elevation Program

(Not Ranked) Public Housing Flood Mitigation Program

*- tied for top 2

**- tied for top 4

Non-Structural Interventions

The following design interventions were identified for their potential to reduce Beaufort's exposure and sensitivity to identified hazards. These non-structural interventions include policies, programs, behaviors, planning efforts, studies, and other interventions that do not necessarily involve physical construction, although they may lead to future construction or other structural interventions.

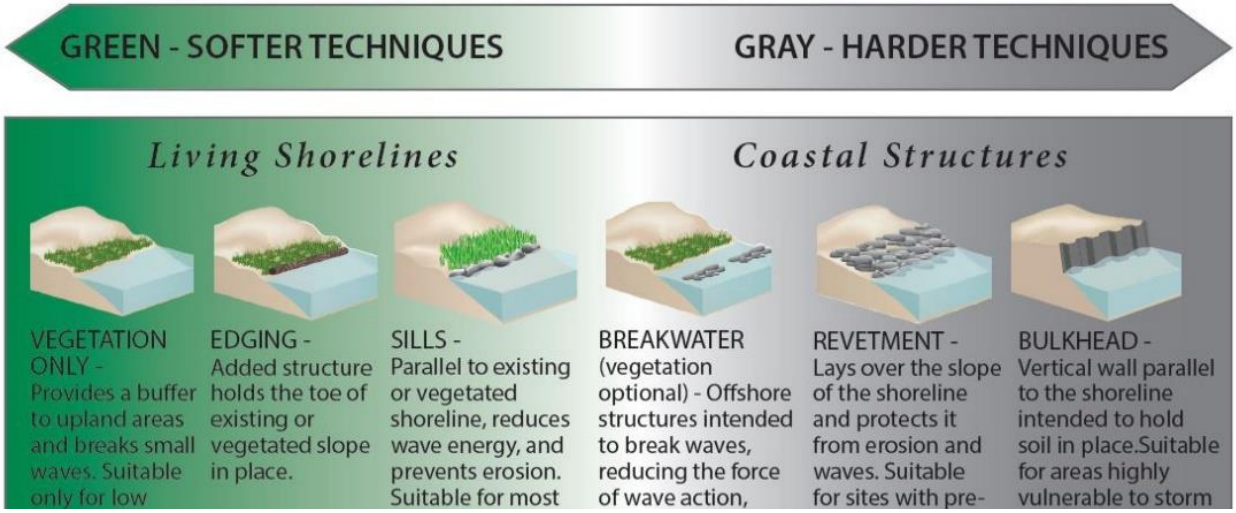
Floodplain Management Plan	
Project Description	Develop a Floodplain Management Plan or Program that comprehensively addresses flooding in the community. This is a credited activity under the Community Rating System. Extra credit is provided for plans that address the natural resources of floodplains and recommend ways to protect them. Given the limitations in the RCCP study, this plan should include an in-depth flood analysis to further assess flooding in Beaufort. The plan will also include a Program for Public Information that addresses public education and engagement.
Hazard(s) Addressed	All flooding types
Type of Solution	Planning document
Estimated Cost	<$100,000
Estimated Timeline	~1 year
Potential Funding Sources	DCM Planning and Management Grant (when available)
Location	Townwide
Prioritization Measures	
Cost-Benefit	High
Social Equity	Medium - Benefits entirety of the Town
Internal Capacity	Medium
Co-Benefits	Public education
Public Survey Ranking	1

Estuarine Shoreline Management Plan	
Project Description	This project would involve the development of an Estuarine Shoreline Management Plan to comprehensively address the management of the Town's estuarine shoreline. It will assess erosion and balance land use, coastal and climate hazards, ecosystem health, public health, and recreational opportunities.
Hazard(s) Addressed	Erosion, storm surge, sea level rise
Type of Solution	Planning document
Estimated Cost	<$100,000
Estimated Timeline	~1 year
Potential Funding Sources	Golden Leaf Flood Mitigation Program
Location / Map	See Natural Assets on page 29
Prioritization Measures	
Cost-Benefit	High
Social Equity	Medium - Benefits entirety of the Town
Internal Capacity	Medium
Co-Benefits	Habitat preservation
Public Survey Ranking	2

Open Space and Parks Master Plan	
Project Description	Providing open space provides the community with a wide range of benefits. In addition to enhancing resilience to flooding and providing critical habitat for threatened and endangered species, parks and open space enhance the community's overall health and wellbeing. This project would involve writing an Open Space and Parks Master Plan to strategically plan how to increase the amount of open space and parks in Town.
Hazard(s) Addressed	All flooding types
Type of Solution	Planning document
Estimated Cost	<$100,000
Estimated Timeline	~1 year
Potential Funding Sources	Wildlife Resources Commission Partners for Green Growth
Map / Location	Townwide
Prioritization Measures	
Cost-Benefit	High
Social Equity	Medium - Benefits entirety of the Town
Internal Capacity	Medium
Co-Benefits	Recreation, health and wellness, habitat
Public Survey Ranking	3

Structural Projects

The following design interventions were identified for their potential to reduce Beaufort's exposure and sensitivity to identified hazards. These structural interventions include physical construction projects or installation of physical mitigation technologies. These projects are not necessarily "shovel ready" and may require additional planning design, and cost estimation.



The spectrum of Natural ("Green"), Hybrid, and Gray Infrastructure solutions to coastal hazard protection. Source: NOAA

Wastewater System Maintenance and Flood Mitigation	
Project Description	Implement lift station and wastewater infrastructure projects identified in the Town's 2021 Wastewater Asset Management Plan, with the addition of flood proofing facilities to account for increased future chance of inundation or flooding. This might include elevating structures or infrastructure such as stacks, ladders, or generator pads, or adding floodproofing and flood mitigation through nature-based features. Improvements should be undertaken according to an established schedule as it best suits the Town's maintenance planning efforts.
Hazard(s) Addressed	Tidal flooding, sea level rise, and floodplain expansion
Type of Solution	Grey Infrastructure Retrofits and Nature-Based
Estimated Cost	>$5 million Replacement of Lift Station #7 - $756,300.00 (FY 2023/24) Rehabilitate Lift Station #6 - $572,800.00 (FY 2024/25) Replacement of Lift Station #1 - $1,070,800.00 (FY 2025/26) Replacement of Lift Station #5 - $714,300.00 (FY 2026/27) Replacement of Lift Station #2 - $756,300.00 (FY 2028/29) Replacement of Lift Station #3 - $814,300.00 (FY 2029/30) Rehabilitate Lift Station #8 - $572,800.00 (FY 2030/31) Sanitary Sewer Rehabilitation - $3,178,400.69 (FY 2031/32)
Estimated Timeline	Next 10 years. See 2022 Wastewater Asset Management Plan, the most current Capital Improvement Program, or Public Utilities maintenance schedule.
Potential Funding Sources	Clean Water State Revolving Fund; Community Development Block Grant-Infrastructure; State Wastewater Reserve Program; Golden Leaf Flood Mitigation Program
Map/Location	Townwide (See Sewer and Critical Infrastructure Assets on page 32)

Prioritization Measures	
Cost-Benefit	High
Social Equity	Medium - Benefits entirety of Town
Internal Capacity	High
Co-Benefits	Wastewater system interruptions, infill and infiltration
Public Survey Ranking	Top 2 (tied)

Low-Impact Development for Reduced Flooding and Enhanced Water Quality	
Project Description	Reducing the amount of stormwater throughout the Town of Beaufort and enhancing the natural function of watersheds is critical for building resilience to coastal and climate hazards. The Town's 2017 Watershed Restoration Plan contains a series of Low-Impact Development actions and projects to enhance the natural function of the Town Creek, Turner/Gibbs Creek, and Taylor Creek Watersheds in which the Town lies. These actions include, but are not limited to, permeable pavement, green streets/alleys, rain gardens, cisterns, permeable pavement, bioswales, green parking, green roofs, and stormwater retention cells. While stormwater improvements are usually done at small scales (think a parking lot or individual property), a system of improvements would collectively result in a large reduction of stormwater and flooding the town experiences, as well as the benefit of improved water quality. Improved water quality results in healthier ecosystems throughout the watershed– healthier ecosystems can provide us with more benefits and ecosystem services like storm protection, flood reduction, and critical habitat. This project will occur in three phases, with each phase focusing on one of the three watersheds in the Town. The list of Low-Impact Development action items in the Watershed Restoration Plan would be prioritized within each watershed, then implemented on a schedule. An additional component of this project, depending on funding sources, could include a property owner cost-share program for Low-Impact Development on private property.
Hazard(s) Addressed	Stormwater flooding, watershed/stormwater system impediments, water quality, development pressures
Type of Solution	Nature-based/green infrastructure; Low-Impact Development; Watershed Restoration
Estimated Cost	$500,000 to $1 million
Estimated Timeline	~2-5 years per phase
Potential Funding Sources	NC DEQ / EPA Section 319 Watershed Restoration fund
Map/Location	Townwide

Low-Impact Development for Reduced Flooding and Enhanced Water Quality	
Prioritization Measures	
Cost-Benefit	High
Social Equity	High -Begin with Town Creek watershed, home to most socially vulnerable populations in town
Capacity to Implement	High
Co-Benefits	Enhanced Water Quality
Public Survey Ranking	Top 2 (tied)

Water System Maintenance and Flood Mitigation

Project Description	Maintaining the integrity of the Town's water system and accounting for future flood risk helps prevent potential interruptions in service. The drinking water infrastructure projects identified in the Town's 2019 Water Asset Capital Improvement Plan would be enhanced with the addition of flood proofing and mitigation strategies. These might include elevating structures or infrastructure such as stacks, ladders, or generator pads, or adding floodproofing or flood mitigation through nature-based features. Improvements should be undertaken according to an established schedule as it best suits the Town's maintenance planning efforts.
Hazard(s) Addressed	Tidal flooding, sea level rise inundation, and floodplain expansion. Although not covered in the assessment of vulnerabilities, saltwater intrusion underground may also be a concern, but would need to be studied separately.
Type of Solution	Grey Infrastructure Retrofits and Nature-Based
Estimated Cost	1A - Crescent Drive 1B - Campen Road $203,300 2A - Live Oak St. - Chestnut Dr. - Circle Drive 2B - Second St. - Legion Drive $2,851,125 3 - Live Oak - Mulberry Street - Pine Street $3,434,535 4 - Cedar Street - Moore Street $374,300 5 - Downtown $4,934,085 6 - West Ann Street and Queen Street: $2,648,085 7 - Front Street - Broad Street (Marsh Street to Gordon Street) $1,407,970 8 - Front Street - Broad Street (Gordon Street to Belle Air Street) $2,492,850 9 - Front Street - Ocean Street (Belle Air Street to Island View Drive) $788,260 10 - East Ann Street $194,130
Estimated Timeline	Next 10 years, one or two per year
Potential Funding Sources	Drinking Water State Revolving Fund; Community Development Block Grant-Infrastructure; State Drinking Water Reserve Program; Golden Leaf Flood Mitigation Program
Map/Location	Townwide (See Water and Critical Infrastructure Assets on page 31)

Prioritization Measures

Cost-Benefit	High
Social Equity	Medium - Benefits entirety of Town
Internal Capacity	High
Co-Benefits	Prevents water service disruption
Public Survey Ranking	Top 4 (tied)

Stormwater System Maintenance and Retrofits	
Project Description	This project would include phased stormwater retrofits throughout the Town of Beaufort based on the 2019 Stormwater Capital Improvement Plan priority hotspots that experience recurring flooding. Hot spots include 100 and 200 Blocks of Gordon St., Meeting St., Hwy 101 near Ace Hardware, Block of Fulford/ Ann/Elm St., Craven and First St., 300 to 500 and 900 to 1600 Front St., 100 Block of Ann St., 700 Block of Broad St. between Pollock and Marsh, 100 Block of Belle Air/1500 Block of Ann St., 200 Block of Belle Air and The Oaks, and Fairview Dr. at Live Oak St. See Capital Improvement Plan for more info on hotspots https://beaufortncorg-my.sharepoint.com/personal/s_burdick_beaufortnc_org/Documents/Attachments/2923-AB_Beaufort_StormCIP_FINAL.pdf
Hazard(s) Addressed	Stormwater flooding, floodplain expansion
Type of Solution	Nature-based and Low-Impact Development
Estimated Cost	$1 million - $5 million
Estimated Timeline	~Phased projects, two per year
Potential Funding Sources	EPA 319 Grant Program
Map/Location	Townwide (See Stormwater Assets on page 33)
Prioritization Measures	
Cost-Benefit	High
Social Equity	Medium - Benefits entirety of Town
Internal Capacity	Medium
Co-Benefits	Enhanced water quality
Public Survey Ranking	Top 4 (tied)

Downtown Waterfront Bulkhead	
Project Description	The Town of Beaufort's Downtown Waterfront is protected, in part, by two bulkhead structures. an assessment of these structures was completed, highlighting the need to update or replace the structures. During the ongoing development of the Town's Waterfront Master Plan, a conditions assessment determined that the Town's bulkhead extending 950 feet of Front Street between Turner Street and Queen Street would benefit most from a total replacement. This would extend its service life far beyond "band-aid" repairs. A 12-to-18 inch lip above the current height of the bulkhead would also provide additional flood protection to that area. The assessment also indicated that the bulkhead extending along 415 feet of Front Street between Queen St. and Pollock St. is in generally good condition, but some minor repairs are needed. In addition to the replacement and repair of these bulkheads, this project could include stormwater retrofits at the stormwater outfalls within each bulkhead, as well as nature-based features or green infrastructure on the edges of each bulkhead to prevent erosion and over-wash in those locations.
Hazard(s) Addressed	Tidal flooding
Type of Solution	Grey infrastructure/stormwater retrofitting
Estimated Cost	$1-5 Million
Estimated Timeline	2-5 years
Funding Sources	FEMA BRIC; NC DEQ 319 grant (for retrofits)
Prioritization Measures	
Cost-Benefit	High
Social Equity	Low - Does not directly benefit vulnerable populations
Internal Capacity	Low
Co-Benefits	Protection of key economic center
Public Survey Ranking	5

Rachel Carson Reserve Bird Shoal Dune Stabilization

Project Description	In addition to protecting critical infrastructure, homes, and businesses from coastal and climate hazards, the Reserve islands provide critical and pristine habitat for endangered species and economically important fish and shellfish. Carrot Island and Bird Shoal act as natural barriers, protecting the Town's south-facing waterfront, Downtown Commercial Waterfront, Historic District, and other critical infrastructure from the Atlantic Ocean and the widening of Beaufort Inlet. Maintaining, restoring, and stabilizing this key natural asset is necessary for sustaining the Town. The project would actively manage sediment dynamics to maintain adequate sandy habitats in the project area to afford continued protection to the Town of Beaufort. The project may include strategic building/connecting/stabilizing of dunes and possible planting of dune vegetation, as well as strategic sediment trapping strategies within the lagoon referred to as Smoke Tree Hole (e.g. living shoreline/oyster reef). The project would also include monitoring to assess the effectiveness of the various strategies to allow for adaptive management of the site into the future. A final scope of this project will be determined in close partnership with the Rachel Carson Reserve.
Hazard(s) Addressed	Reduction of the risk of breaching of the natural barrier afforded by the RCR to the Town of Beaufort. Reducing the risk of breaching would address potential accelerated erosion and potential increased wave induced flooding
Type of Solution	Nature-based/green infrastructure, innovative technology; marsh restoration, dune stabilization, living shoreline
Estimated Cost	$100,000 - $500,000
Estimated Timeline	Currently under preliminary engineering and design with Kris Bass Engineering and NC State
Potential Funding Sources	NC Land and Water Fund; FEMA Building Resilient Infrastructure and Communities; USDA Natural Resource Conservation Service Watershed Protection and Flood Prevention Program; National Fish and Wildlife Foundation Coastal Resilience Fund; US Fish and Wildlife Service Coastal Program

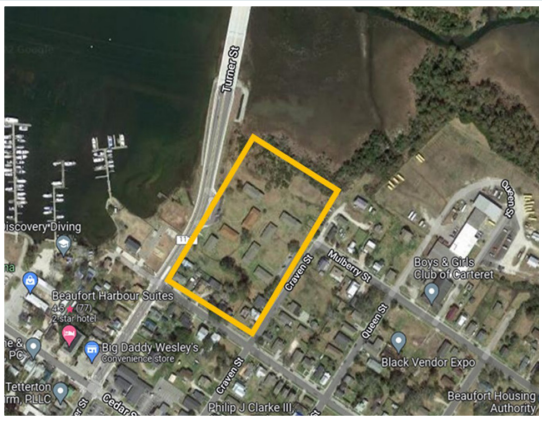
Prioritization Measures

Cost-Benefit	Medium to High
Social Equity	Medium - Benefits entirety of the Town
Internal Capacity	Medium
Co-Benefits	Habitat restoration
Public Survey Ranking	6

Front Street Green Infrastructure and Nature-Based Solutions	
Project Description	Front Street, located on the Town of Beaufort's south-facing waterfront, is in major risk of being inundated with tidal floods, rainfall, and storm surge. This project would include 1) the evaluation of nature-based features to provide additional freeboard along Front Street to reduce tidal flooding and 2) implementation of preferred features in a phased approach based on prioritization. One specific application being considered for further evaluation would use a geotextile fabric to envelope fill material that would be shaped to a designed elevation and slope. The geotextile fabric would minimize erosion of the fill and promotes the growth of planted vegetation either into or atop of the berm.
Hazard(s) Addressed	Tidal flooding, sea level rise, storm surge, and floodplain expansion
Type of Solution	Nature-based/green infrastructure
Estimated Cost	$1 million - $5 million
Estimated Timeline	Study 6mo-1yr; Projects phased over 5-10 years
Potential Funding Sources	NC Land and Water Fund; FEMA Building Resilient Infrastructure and Communities; USDA NRCS Watershed Protection and Flood Prevention Program; USDOT Rebuilding America Infrastructure with Sustainability and Equity (RAISE) grant program, Golden Leaf Flood Mitigation Program
Prioritization Measures	
Cost-Benefit	High
Social Equity	Low - Does not directly benefit vulnerable populations
Internal Capacity	Medium
Co-Benefits	Town aesthetics, stormwater filtration, water quality enhancement
Public Survey Ranking	7

Public Housing Flood Mitigation Program	
Project Description	Coordinate with Beaufort Housing Authority for flood mitigation projects, beginning with a project at the Turner Street public housing complex. The project would include a flood assessment of this area that assesses stormwater drainage, issues with backflow from outfall, and feasibility of elevation of structures, modification of parking area, and or other flood proofing of the overall property.
Hazard(s) Addressed	Stormwater flooding, tidal flooding, sea level rise, floodplain expansion, storm surge
Type of Solution	Hazard Mitigation
Estimated Cost	Under development
Estimated Timeline	Long Term Program
Potential Funding Sources	FEMA BRIC; Golden Leaf Flood Mitigation Program

Prioritization Measures	
Cost-Benefit	High
Social Equity	High - Directly benefits low-income and senior populations
Internal Capacity	Medium
Co-Benefits	Protection of affordable housing stock
Public Survey Ranking	Not scored



Cedar Street Waterfront Park	
Project Description	Parks and open spaces are key for enhancing community resilience. Waterfront parks, especially, can serve as a buffer that provides storm protection and flood reduction to nearby properties, contribute to the holistic well-being of individuals in the community, promote community cohesion, and increase environmental public awareness. Cedar Street Waterfront Park is a planned park on the property that used to serve as the base of the bridge at the Western end of Cedar Street. The project is described in the 2016 Small Area Plan as follows: "The park's current plan features a 21-space parking lot, a turnaround/drop-off area, bicycle parking, restrooms, picnic areas, weaving paths, an elevated site for water views, seat steps, a lawn area, bench swings, and a fishing beach area. The plan also includes a design for part of Cedar Street leading up to the park. It proposes a two-lane street with a 10-foot wide, multiuse path on its south side. Additional street lighting and planting areas are also included." The Cedar Street Waterfront Park should be designed to shift and transform during periods of extreme weather and flood. Cedar Street Waterfront Resilience Park could include a living shoreline on either side of the existing bulkhead, marsh restoration, low-impact development (LID) strategies to absorb stormwater, and additional public amenities that promote community cohesion. Such elements could include a kayak launch, dock, tree plantings, rain garden, permeable pavement, and floodproofing of bathroom facilities. Additionally, informational signage throughout the park will enhance community awareness and education.
Hazard(s) Addressed	Erosion, tidal flooding, sea level rise, storm surge, floodplain expansion
Type of Solution	Nature-based/green infrastructure; Low-Impact Development
Estimated Cost	$500,000- $1 million
Estimated Timeline	*This property has not yet been turned over to the Town of Beaufort from the NC Department of Transportation but is anticipated to be done so soon
Potential Funding Sources	NC PARTF Grant; NC DCM Access Grant; NC Land and Water Fund; FEMA Building Resilient Infrastructure and Communities; USDA NRCS Watershed Protection and Flood Prevention Program; National Fish and Wildlife Foundation Coastal Resilience Fund; EPA 319 Grant Program; Golden Leaf Flood Mitigation Program

Cedar Street Waterfront Park	
Prioritization Measures	
Cost-Benefit	Medium
Social Equity	High - Located near identified socially vulnerable area
Internal Capacity	High - currently in design phase
Co-Benefits	Recreation Amenity
Public Survey Ranking	8

Gallant's Channel Living Shoreline	
Project Description	Gallant's Point and adjacent areas along Gallant's Channel, including the Michael J. Smith Airport and the NC Maritime Museum's property, are at risk of erosion, storm surge, tidal flooding, and sea level rise. This area would likely benefit from installing a living shoreline to provide enhanced protection. A feasibility study to locate specific areas within this larger project area will be needed to further investigate the suitability of different types of living shorelines along this site. According to The Nature Conservancy's Living Shoreline Explorer, the northern area would likely benefit from a hybrid living shoreline, such as a marsh-sill, due to a higher wave energy than nearby areas. The southern end would likely benefit from a traditional living shoreline with vegetation and oysters. This project would be done in close partnership with the NC Maritime Museum, Michael J. Smith Airport Authority, and the North Carolina Coastal Federation.
Hazard(s) Addressed	Erosion, tidal flooding, sea level rise, storm surge
Type of Solution	Nature-based/green infrastructure; living shoreline
Estimated Cost	$1 million - $5 million
Estimated Timeline	2-4 years
Potential Funding Sources	NC Land and Water Fund; FEMA Building Resilient Infrastructure and Communities; USDA NRCS Watershed Protection and Flood Prevention Program; National Fish and Wildlife Foundation Coastal Resilience Fund; US Fish and Wildlife Service Coastal Program; Golden Leaf Flood Mitigation Program

Prioritization Measures	
Cost-Benefit	High
Social Equity	Low - Does not directly benefit vulnerable populations
Internal Capacity	Low
Co-Benefits	Habitat Restoration
Public Survey Ranking	9

Stormwater Outfall Retrofits	
Project Description	This project would include 1) the evaluation of existing stormwater outfalls and connections to the Towns stormwater system, and 2) include the purchase and installation of backflow prevention devices for priority stormwater outfalls in Beaufort. The assessment would focus on whether backflow prevention at specific outfalls would prevent flooding in the vicinity of stormwater inlets and the existing condition of the outfalls and stormwater system. Cracks in the stormwater system that allow ground water to infiltrate into the system, would decrease the effectiveness of these backflow preventers. The assessment would identify and provide cost estimates for repairing such issues. The back-flow prevention These devices are specifically designed for use in the marine environment and prevent tidal waters from backflowing into waterfront outfalls and flooding areas around stormwater inlets. The project would also include the development of a routine maintenance plan to keep the backflow preventers operational.
Hazard(s) Addressed	Tidal flooding, saltwater intrusion/sea level rise
Type of Solution	Development of long-term phased plan and installation of check valves designed to prevent tidal waters from backing up into the storm drain system.
Estimated Cost	$100,000 - $500,000
Estimated Timeline	~1-2 years
Potential Funding Sources	NC DEQ / EPA Section 319 Watershed Restoration Fund, Golden Leaf Flood Mitigation Program
Map/Location	See Stormwater Assets on page 33
Prioritization Measures	
Cost-Benefit	Low
Social Equity	Medium - Benefits entirety of the Town
Internal Capacity	High - one of the easiest to implement with a high payoff
Co-Benefits	Protection of stormwater system
Public Survey Ranking	10

Historic Structure Elevation Program	
Project Description	The Town of Beaufort is the third oldest Town in North Carolina, established in 1709. With this rich history, there are many historically significant structures and properties within the Town's Downtown Historic District. Many of these properties are at risk from flooding and sea level rise, threatening these important cultural assets. This project would include a program for elevation of historic properties, facilitating the process of raising their structures to better withstand future risks.
Hazard(s) Addressed	Stormwater flooding, tidal flooding, sea level rise, floodplain expansion, storm surge
Type of Solution	Hazard Mitigation
Estimated Cost	(Evaluated per structure)
Estimated Timeline	~2-3 months per structure
Potential Funding Sources	National Park Service Historic Preservation Fund
Prioritization Measures	
Cost-Benefit	Medium
Social Equity	Low - Does not directly benefit vulnerable populations
Capacity to Implement	Low
Co-Benefits	Historic Preservation
Public Survey Ranking	11

Historic Resources