Resilient Beaufort

TOWN of BEAUFORT
NORTH CAROLINA

Completed: 04/13/2022

Acknowledgments

Steering Committee

» Guy Copes
» Johnna Davis
» Paula Gillikin
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» Diane Meelheim
» Ralph Merrill
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With sincere appreciation to all the members of the public who participated and contributed their time and perspectives.

This plan facilitated by:

STEWART

TOWN of BEAUFORT NORTH CAROLINA

COASTAL PROTECTION ENGINEERING

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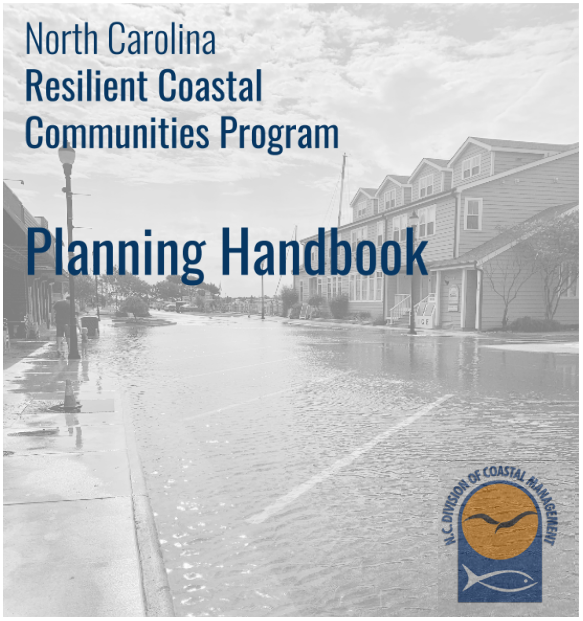
About the Resilient Coastal Communities Program

Coastal and climate hazards like sea level rise, flooding, and storm surge continue to threaten the Town of Beaufort. The Town is considered a frontline community because of its position along the coast and extreme susceptibility to the impacts these hazards bring. Every part of day-to-day life can be interrupted, causing a ripple effect felt throughout the Town.

Planning for these hazards, accounting for future conditions, and developing community and science-driven solutions are vital steps to ensuring the well-being and sustainability of the Town. The Town of Beaufort received a grant to participate in the N.C. Division of Coastal Management's North Carolina Resilient Coastal Communities Program (RCCP). This exciting new grant program aims to improve community resilience to coastal and climate hazards.



Grant program handbook.

What is "Resilience"?

Resilience refers to the ability of a community or system to withstand or "bounce back" from an impact.[1] Here, Beaufort is focusing on climate and coastal resilience, looking at risks to our community from flooding, storm events, and sea level rise. We will be using a triple-bottom-line approach that highlights the social, environmental, and economic impact of these increasing hazards.

1. Paton D, Millar M, Johnston D. Community resilience to volcanic hazard consequences. Natural Hazards. 2001 2001/09/01;24(2):157-69. English.

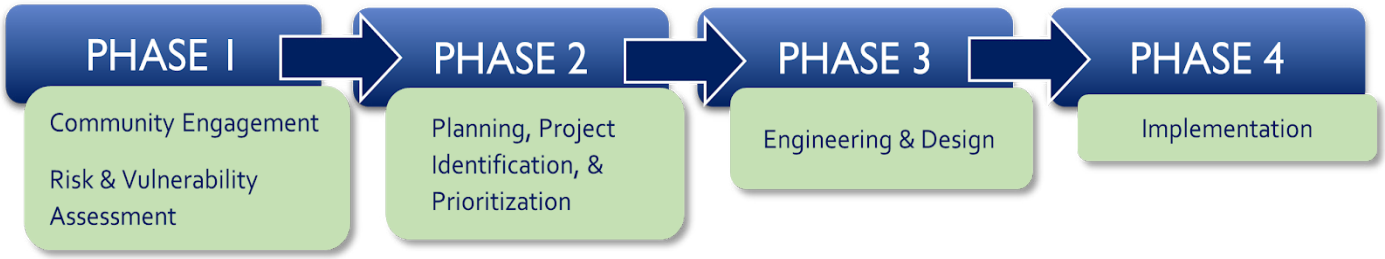
Project Objectives

The primary goal of Phases 1 and 2 of the RCCP is to provide local governments with funding and assistance to complete a resiliency planning initiative and:

- Perform a data- and community-driven risk and vulnerability assessment
- Develop a portfolio of well planned and prioritized solutions to address risks
- Create a platform for launching into Phases 3 and 4 (Design and Construction).

Front Street closed at Queen Street intersection during the November 2021 king tide event (Harriet Altman).

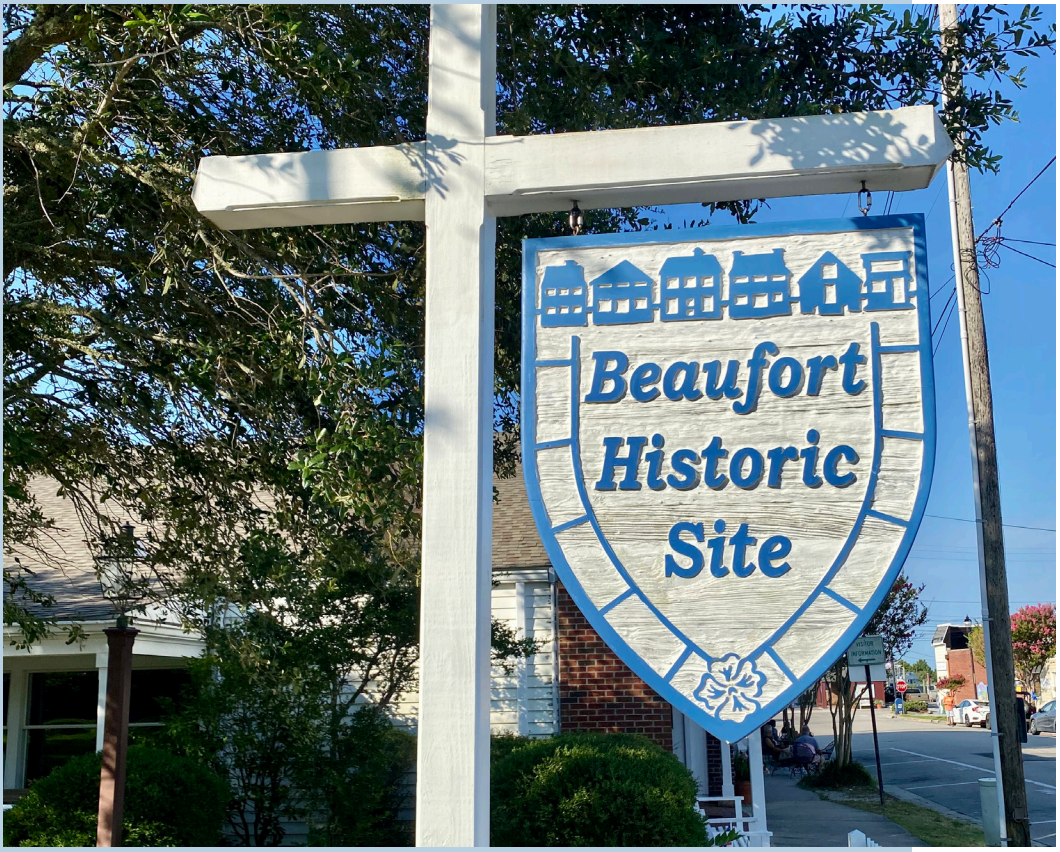
Project Phases



The focus of this planning document is Phases 1 and 2 of the overall RCCP program.

Program partners and funders for the North Carolina Resilient Coastal Communities Program Planning Handbook.

1 Community Engagement



Community Engagement Strategy

This Community Engagement Strategy outlines public engagement goals and specific actions the Town of Beaufort, Stewart, and the Community Action Team took to collect insightful, accurate public sentiment during the development of the Resilient Beaufort Plan Given that the feedback received during the Comprehensive & CAMA Land Use Plan was so heavily drawn upon for this effort and these processes overlapped so significantly, the public engagement efforts undergone during the Comprehensive & CAMA Land Use Plan are also outlined.

Public Participation Goals

Robust community engagement is essential to creating a plan that reflects and serves the community. Going beyond just informing about the process to meaningfully engage and empower community members is key for fostering trust and more effective and equitable outcomes. With this in mind, the following goals guided the creation of the community engagement strategy for the Resilient Beaufort initiative:

- ☑ **Equity, Inclusivity, and Diversity:** Engagement demographics are representative of Town demographics according to latest Census data, including racial, income, and age demographics.
- ☑ **Engagement Choices:** Community engagement opportunities are varied and equitable so community members can choose the option that works best for them.
- ☑ **Meaningful Dialogue:** Community engagement opportunities ask meaningful questions, provide open platforms for discussion, and feature accessible activities within each meeting so community members feel heard and empowered.

> *"**Equality** is giving everyone a shoe. **Equity** is giving everyone a shoe that fits."*
>
> ***- Naheed Dosani***

Community Action Team

The Beaufort Community Action Team was developed as a non-appointed steering committee to champion the effort alongside Town staff and the Stewart team during the development of the Resilience Beaufort Plan. The Community Action Team was created by expanding upon the CAMA Land Use and Comprehensive Plan Steering Committee. These committee members were asked to participate in the Resilient Coastal Communities Program because of the significant amount of overlap between the two simultaneous efforts. The Comprehensive Plan Steering Committee members have an extensive background knowledge of the goals, vision, and concerns within the Town with respect to future land use and will be an asset to the Community Action Team. Additional members were added to this steering committee to ensure inclusivity and expand the team's expertise.

The Community Action Team consisted of the following members: Diane Meelheim, Paula Gillikin, Ralph Merrill, Heather Poling, Henry Everett, Johnna Davis, Robert Harper, Guy Copes, Mackenzie Todd (ex-officio), and Sarah Spiegler (ex-officio). The Community Action Team meets monthly to discuss the project and provide expertise and local knowledge.

Public Participation Methods

To support the Engagement Choices goal, the project team will offer a diverse set of engagement methods at various stages of the project. These include:

Community Workshops/Open Houses

- Digital Public Surveys
- Project website: to host materials relevant to the program to encourage public participation
- Public Poster Sessions at Community Events

Socially Vulnerable & Historically Under-represented Groups

Socially vulnerable and historically under-represented groups within the community are often not involved in planning processes and face disproportionate impacts from coastal and climate hazards. Including traditionally underrepresented groups from **frontline communities** in resilience planning is critical for equitable outcomes. Given that social aspects of the Town contribute to overall community resiliency, having the most inclusive approach possible is key.

Socially vulnerable groups often require additional engagement to ensure active participation. Vulnerable populations are typically underrepresented in civic processes due to many barriers such as language, lack of extra time, or access to internet. Public engagement for the Resilient Beaufort Plan was designed to help overcome obstacles to civic engagement in order to properly capture the complexity and diversity of the Town's population. The following groups were engaged to ensure an inclusive process:

1. Faith groups and churches
2. Community organizations, such as the Rotary Club
3. Affordable/subsidized housing authorities, such as the Beaufort Housing Authority

To ensure those with limited internet access can participate in the process, a variety of non-digital and in-person engagement opportunities are available. Holding informational sessions at community events upon request, outside of the typical municipal facility setting, will help ensure greater participation.

- The following digital media was used to promote the project and create general awareness:
- Local newspaper
- Regional online newspaper
- Local TV news outlet
- Facebook
- Instagram
- Town website

Frontline communities - people who are both highly exposed to climate risks (because of the places they live and the projected changes expected to occur in those places) and have fewer resources, capacity, safety nets, or political power to respond to those risks (e.g. these people may lack insurance or savings, inflexible jobs, low levels of influence over elected officials, etc.) (Georgetown Climate Center). This includes, but isn't limited to: people of color, low-income, immigrants, those at-risk of displacement, senior citizens, populations experiencing homelessness, outdoor workers/climate-vulnerable labor, incarcerated populations, renters/subsidized housing tenants, unemployed/underemployed, youth, persons with disability, and chronically-ill/hospitalized people.

Community Engagement Timeline

The following is a timeline of community engagement activities during both the Comprehensive/CAMA Land Use Plan and Resilient Beaufort Plan Development.

Comprehensive/CAMA Land Use Plan Engagement Timeline			
Activity	**Description**	**Date**	**Purpose**
Virtual Town Hall Meeting	Public meeting; project start-up meeting	10/8/2020	Introduce land use planning process, project schedule, and public engagement strategy. Introduced community discussion around collective goals for resiliency.
Project website launch	Establish online presence; begin online outreach and information dissemination	12/1/2020	Set up and populate the project website with information relevant to the process
Stakeholder interviews; Community tour	Series of 1-hour meetings with small groups of stakeholders; determine issues of general and specific community concern	12/8/2020	Conversations with groups that share similar focus or concerns; Explore the community to examine areas of community concern
Steering Committee meeting #1	Working group meeting to review findings and analysis, and receive direction	12/9/2020	Discussion of the observations from stakeholders, preliminary existing conditions analysis, and values and priorities of the Committee
Steering Committee meeting #2	Working group meeting to review findings and analysis, and receive direction	2/18/2021	Discussion of plan assessments, inclusion into the plan, preliminary mapping efforts, and community profile, review prelim. goals and vision
Community survey #1	Online survey and outreach effort	2/10/20 - 3/10/20	Gather input from the community on values, priorities, and concerns. Advertised in water bill insert to reach those who are not engaged online.

Comprehensive/CAMA Land Use Plan Engagement Timeline			
Activity	**Description**	**Date**	**Purpose**
Public open house / community workshop #2	Interactive input from the community on values, preference, and direction	3/23/2021	Large community event with breakout groups for public to review existing conditions, survey 1 results, and draft resiliency and environmental goals for the town
Community survey #2	Online survey and outreach effort	3/23/21-4/14/21	Gather feedback on the draft vision and goals of the plan
Steering Committee meeting #3	Working group meeting to review findings and analysis, and receive direction	5/6/2021	Finalize input on issues, opportunities, vision, and goals of the plan; Review public open house findings, preliminary future land use and mitigation strategies
Steering Committee meeting #4	Working group meeting to review findings and analysis, and receive direction	6/22/2021	Review draft Future Land Use Map and character areas
Steering Committee meeting #5	Working group meeting to review findings and analysis, and receive direction	7/27/2021	Review draft Land Use Plan and refine Future Land Use Map, and provide comment
Public open house/community workshop #3	Interactive input from the community on the draft plan, including resiliency and environmental goals and future land use strategies for mitigation	10/14/2021	Introduce draft plan, goals, recommendations, and strategy to the public.
Community survey #3	Online survey and outreach effort	10/14-11/11/2021	Gather feedback on draft Plan.
Steering Committee meeting #6	Working group meeting to review findings and analysis, and receive direction	12/2/2021	Review public feedback on draft plan and discuss outstanding changes needed in draft plan.

RCCP Engagement Timeline			
Activity	**Description**	**Date**	**Purpose**
CAT Meeting #1	Community Action Team meeting to introduce the RCCP, discuss member roles, and gather feedback on initial steps	11/3/2021	Review community engagement strategy; set vision and goals; preliminary mapping and identifying missing data; discuss review of existing plans and efforts
Project Website Launch	Establish online presence; begin online outreach and information dissemination	11/20/2021	Set up and populate the project website with information relevant to the process
CAT Meeting #2	Community Action Team meeting to gather input on the risk and vulnerability assessment inputs	12/8/2021	Finalize community assets and natural infrastructure to include in assessment
CAT Meeting #3	Community Action Team meeting to review and discuss risk and vulnerability assessment	1/12/2022	Present risk and vulnerability assessment, gather additional feedback to incorporate
Public Meeting #1	Virtual Public Meeting	1/27/2022	Present project, existing conditions, climate change and SLR projects, and invite public comment on assets.
Public Survey #1	Online survey and outreach effort	1/27/2022 - 2/10/2022	Gather public feedback on critical assets
CAT Meeting #4	Community Action Team meeting to discuss Phase 2, Step 1	2/16/2022	Brainstorm solutions to vulnerability assessment
Public Meeting #2	Virtual Public Meeting	3/3/2022	Present list of identified critical assets to the community. Gather feedback on priority mitigation projections
Public Survey #2	Online survey	3/3/2022 - 3/16/2022	Gather public input on priority mitigation projects
CAT Meeting #5	Community Action Team meeting to discuss Phase 2, Step 2	3/9/2022	Consolidate and prioritize projects/actions for final document

Ongoing Community Engagement Tasks			
Activity	**Description**	**Date**	**Purpose**
Project notices	Distribute notices via Town staff and website prior to events	Prior to major events	Advertise input events, community meetings, hearings, etc.
Project press releases	Distribute notices & project updates	Prior to major public events	Inform public about project status, upcoming events, and accomplishments
Community survey	Online survey accessed 24/7 during open period	Prior to first public meeting	Gain insights from diverse groups within the community
Website, social media	Website updates and information sharing through staff	At milestones and after CAT meetings	Inform public about project status, upcoming events, and accomplishments

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2 Community Vision & Goals

The focus of this resiliency planning effort is on identifying ways that the Town can reduce the negative impacts of climatic change and coastal hazards on the community in order to minimize disruptions to daily life and increase safety and prosperity. The vision and goals presented below are initially adapted from public outreach performed during the comprehensive plan update. They were then vetted, reshaped, and refined by the Community Action Team, Town staff, and the consultant team.

Resiliency Vision

The Town of Beaufort will become North Carolina's leader in climate and coastal adaptation by:

1. **Explicitly considering climate change and sea level rise** in all infrastructure planning, construction, and maintenance decisions and budgeting for the additional costs that this will require.

2. **Reducing the economic, social, and mental health impacts of sunny day and stormwater flooding events** (in both extent and frequency) over the next 10 years (when compared to the previous 10 years) and prepare for the more extreme and frequent flooding that is expected in the years beyond.

3. **Ensuring socially, economically, and/or traditional disadvantaged neighborhoods receive support and protection** at an equal or greater amount than the community-at-large and are encouraged to take actions to reduce the fear of flooding.

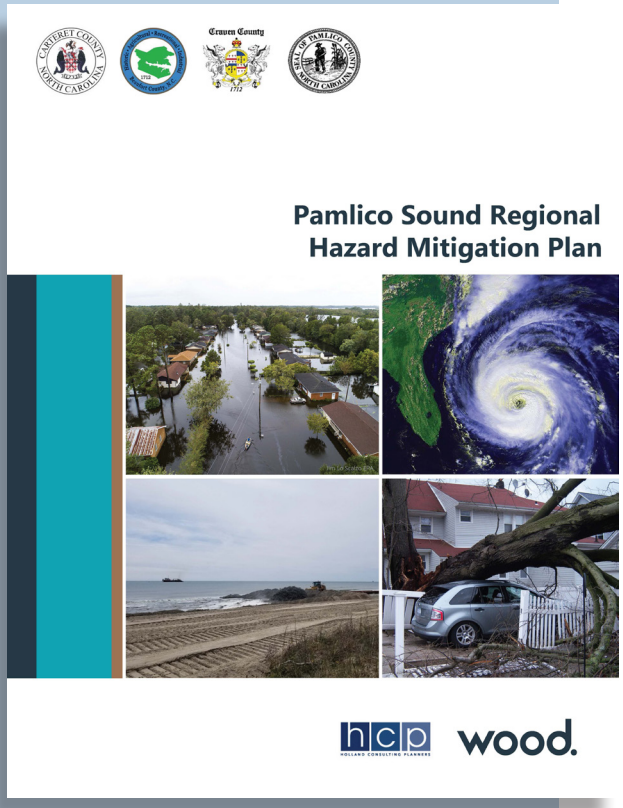
4. **Accommodating or reversing natural shoreline loss** throughout the entire jurisdiction and facilitating coastal habitat migration or transition as seas rise.

5. **Partnering with the Rachel Carson Reserve** to ensure that the island remains a natural barrier to storm driven waves and erosion.

6. **Keeping people in their neighborhoods** or, when that is not feasible, helping those people relocate and the publicly reclaiming those areas as green space buffers that will protect other homes and places.

7. **Maintaining natural hazard and emergency response capabilities**, evacuation routes, and emergency services at levels (physical and operational) that can respond to current and future conditions.

3 Previous Planning Efforts



Previous planning efforts were researched to help form the foundation of knowledge for this planning process. The following plans were specifically consulted.

2020 Pamlico Sound Regional Hazard Mitigation Plan

Section 322 of Disaster Mitigation Act of 2000 emphasizes the need for state and local government entities to closely coordinate on mitigation planning activities and make the development of a hazard mitigation plan a specific eligibility requirement for any local government applying for federal mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation (PDM) program, and the Flood Mitigation Assistance (FMA) Program, all of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. An adopted and federally approved hazard mitigation plan positions Beaufort to receive available mitigation funds before and after disaster strikes.

This plan was prepared in coordination with FEMA Region IV, North Carolina Emergency Management (NCEM), and members of a Hazard Mitigation Planning Committee (HMPC), which included representatives from the County, Town, and Town departments, citizens, and other stakeholders to ensure compliance with all applicable federal and state planning requirements. The Pamlico Sound Regional Hazard Mitigation Plan establishes the vision and guiding principles for reducing hazard risk and proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

The plan includes 24 "action items" for the Town to implement, continue, or improve upon. Action items on the municipal level include:

- Annually review and maintain the County's Continuity of Operations Plan in an effort to ensure ongoing governmental operations following a natural or man-made disaster event. The County, in conjunction with all participating municipal jurisdictions, will review this plan annually and update as deemed necessary.
- Maintain, and where necessary, establish backup generators at all identified critical facilities. Additionally, County Emergency Services will evaluate the equipment on a regular basis to assure it continues to meet operational demands at county facilities. (Public utilities)
- Maintain a contract with a qualified post-disaster recovery service provider. This contract will include the provision of essential services and equipment, including generators, and will include documentation required for reimbursement from FEMA/NCEM.
- Meet annually with all electric service providers operating within the County prior to hurricane season, in preparation for the effects of severe weather, and will provide the preliminary planning steps required for effective post-disaster recovery.
- Maintain all property acquired within the Special Flood Hazard Area (SFHA) as undisturbed open space in perpetuity. Continue to proactively establish open space within the floodplain and floodway as HMGP grant funds become available to carry out this initiative.
- Maintain reciprocal mutual aid agreements with all neighboring communities in an effort to ensure adequate fire protection throughout the County. Additionally, all jurisdictions will provide preventative maintenance efforts to ensure the fire hydrants and equipment are working properly.
- Review and update respective Flood

Damage Prevention Ordinance as deemed necessary. Once annually, all jurisdictions will conduct a review to ensure

- That the current FDPO is compliant with all FEMA and NCEM mandates.
- Strive to maintain respective CRS ratings through implementation of a comprehensive floodplain management program.
- Increase the availability of skilled contractors to perform needed work post hazard by:
  - Developing a partnership with major national contractors in selected areas (roofing, tree trimming, etc.), such that they will deploy resources and skilled contractors to affected areas as needed.
  - Creating local contractor retention plan (perhaps with incentives related to permits, commitments for County/City projects, a reduction in community college tuition, etc.) to reduce the flight of local skilled labor.

2019 Stormwater Capital Improvements Plan

The Capital Improvements Plan provides a roadmap for the Town of Beaufort to use in building, repairing, sustaining the stormwater infrastructure to continue providing stormwater collection and transmission for its citizens. The plan provides an overview of existing conditions of Beaufort's watersheds and proposes rehabilitation/ replacement projects aimed at optimizing the existing stormwater infrastructure to reduce stormwater runoff and flooding. It also provides estimated cost and prioritizes needed improvements using three priority levels. "Priority 1" improvements are immediate improvements that will take place within the next two years (2020-2021). "Priority 2" improvements are non-critical improvements that will take place over following four years (2022-2025). "Priority 3" are long-term infrastructure improvements that take place over a 15-year period (2026-2040). In addition, the Plan provides options for additional funding.

2020 Pamlico Sound HMP Flooding Risk Assessment

Impacted by the *existing* 100-year flood (aka 1% annual flood chance area)

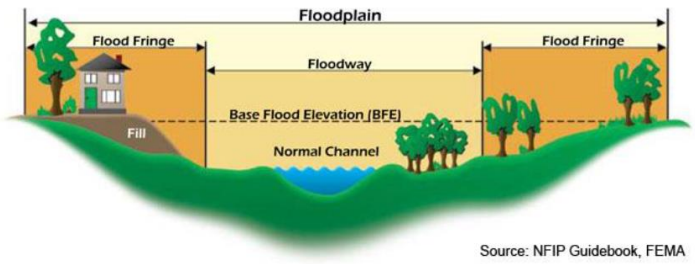
Estimated Vulnerable Populations Impacted:

- Total Population at Risk: 24.7%
- People 65 and older: 24.8%
- Children 5 and under: 24.8%

Estimated Buildings Impacted:

- Total Buildings at Risk: 23.5%
- Residential Buildings at Risk: 11.9%
- Commercial Buildings at Risk: 1.4%
- Public Buildings at Risk: 0.1%

Characteristics of a Floodplain



Source: NFIP Guidebook, FEMA

Recommendations for this Plan are separated into "Priority" improvements by watershed and are as follows:

- Priority 1-short term improvements with a timeframe of 2 years
- Priority 2-non-critical improvements/ maintenance over 4 years
- Priority 3-long term improvements/ maintenance over 15 years

2017 Beaufort Watershed Restoration Plan

The Town of Beaufort developed a watershed restoration plan to reduce stormwater runoff in the Beaufort Watersheds, which include Town Creek watershed, Taylor Creek watershed, and Davis Bay watershed. The plan seeks to address restoring and maintaining the water quality of three Beaufort watersheds, reduce instances of localized flooding to improve safety and protect property, and prioritize cost effective low impact development and stormwater retrofit techniques to address stormwater management. The plan

Locally important watersheds

includes reduction techniques that reduce the volume of stormwater runoff. These reduction techniques are listed as project opportunities:

Potential Project Opportunities

- When possible, align current or future walking tours or trails to incorporate nearby stormwater retrofit demonstration sites, include projects at Maritime Museum, Memorial Garden, Beaufort Historical Society.
- Install rain garden at park across from Town Hall and Carteret County Libraries.
- Install rain gardens, replace parking lots with permeable pavement, and install downspout retrofits as part of an educational site at Beaufort Elementary and Middle Schools Complex.
- Install rain gardens, shade tree plantings, and replace parking lots with permeable pavement at Freedom Park, Fisherman's Park, and Post Office.
- Install downspout retrofits at public buildings, such as: Libraries (2), Schools (3), Carteret County Parks and Rec, Carteret Public Works, Beaufort Water Dept., Post Office, Safrit Welcome Center, Maritime Museum, Town Hall, Beaufort Fire Department, Carteret County Social Services, Beaufort Police Department, Beaufort Water Department, Carteret County Sheriff's Office, Beaufort Courthouse, and Carteret County Library.
- Install Green Street Designs (Appendix G) retrofits and updates along areas of ditching, connected conveyance systems, right of way, and street ends throughout all areas of the watershed.
- Plant shade trees along Highway 70 Bypass.
- Installation of planter boxes, swale islands, curb cuts, and additional green street design, particularly in where large impervious surfaces exist.
- Installation of native plants at Town welcoming signs and parks.
- Installation of living shorelines projects at or near stormwater runoff outflows.

Additional Potential Project Opportunities

- Rain garden installations at listed local businesses (pg 66)
- Curb section removal in tandem with rain garden installations at listed businesses (pg 66)
- Shade trees at listed locations (pg 67)
- Downspouts at listed locations (pg 67)
- Permeable Pavement at listed locations (pg 67)

2019 Water Asset Management Plan

The Water Asset Management Plan (WAMP) was created to ensure the adequate operation and maintenance of system assets into the future. It inventories current assets, assesses their condition, ranks and prioritizes needs, and establishes a capital improvement plan the public water system. As a historical town, some of the system's assets are in need of replace due to being outdated or inefficient. The Plan also includes a criticality assessment. The final result is a list of priority capital projects that the town will incorporate into its CIP.

Water asset priority projects	
1A - Crescent Drive & 1B - Campen Road	$203,300
2A - Live Oak Street, Chestnut Drive, Circle Drive & 2B - Second Street and Legion Drive	$2,851,125
3 - Live Oak Street, Mulberry Street, and Pine Street	$3,434,535
4 - Cedar Street - Moore Street	$374,300
5 - Downtown (Moore, Orange, Turner, Craven, Queen, Pollock, Broad)	$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 and Ocean Street (Belle Air Street to Island View Drive)	$788,260
10 - East Ann Street (Belle Air to Laurel Lane)	$194,130

2021 Wastewater Asset Management Plan

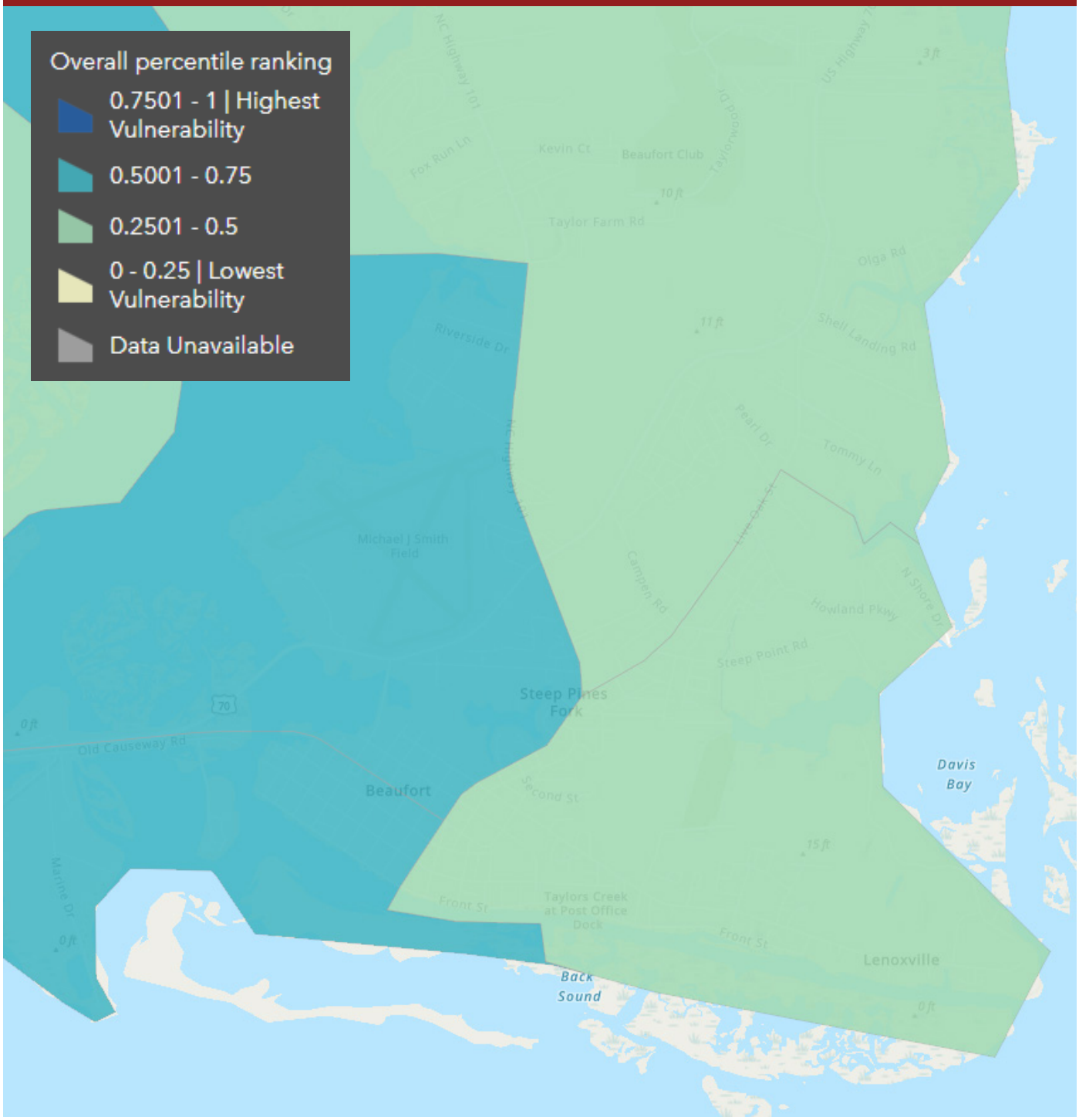
The Town's Wastewater Asset Management Plan ensures the adequate operation and maintenance of system wastewater assets. It provides the documentation and support for a 10-year budget forecast for Town wastewater assets. It inventories current assets, assesses their condition, ranks and prioritizes needs, and establishes a capital improvement plan the public wastewater system. It found that the conditions of the system overall is fair, but the age of parts of the system will necessitate replacement and upgrades. Priority projects were determined as seen in the chart below.

Wastewater asset priority projects	
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)

Social Vulnerability

The U.S. Centers for Disease Control (CDC) has created a Social Vulnerability Index using Census data trying to estimate social vulnerability using a number of different factors. The interactive, online map of this index can be found at: https://www.atsdr.cdc.gov/placeandhealth/svi/index.html. These include many factors that are compiled into four categories: Socioeconomic vulnerability, household vulnerability, language vulnerability, and transportation vulnerability. This index was consulted and shared with the Community Action Team and the general public when discussing the social vulnerabilities of the Town. The map on the right shows the composite social vulnerability scores by Census Block Group.

Composite Social Vulnerability Index



Source: U.S. Centers for Disease Control.

4 Inventory of Assets

Local Importance

The North Carolina Resilient Coastal Communities Program requires the Community Action Team to include locally important critical assets and natural infrastructure within the risk and vulnerability assessment.

FEMA's Community Lifelines framework provides a good starting point for considering which critical infrastructure to include in the risk and vulnerability assessment. FEMA defines a community lifeline as "enabling the continuous operation of critical government and business functions and is essential to human health and safety or economic security."

Why use Community LIfelines?

FEMA developed community lifelines to increase effectiveness in disaster operations and better position themselves to respond to catastrophic incidents. Lifelines are the most fundamental services in the community that enable all aspects of the community, when these service become disrupted rapid response is required. During response, priority efforts focus on stabilizing community lifelines to provide an outcome-based survivor-centric frame of reference to assist responders with root cause analysis, interdependencies, prioritization, and ease of communication.

Community lifelines are categorized by safety and security, food water, and shelter, health and medical, energy, communications, transportation, and hazardous materials. Under each category is a description of its components.

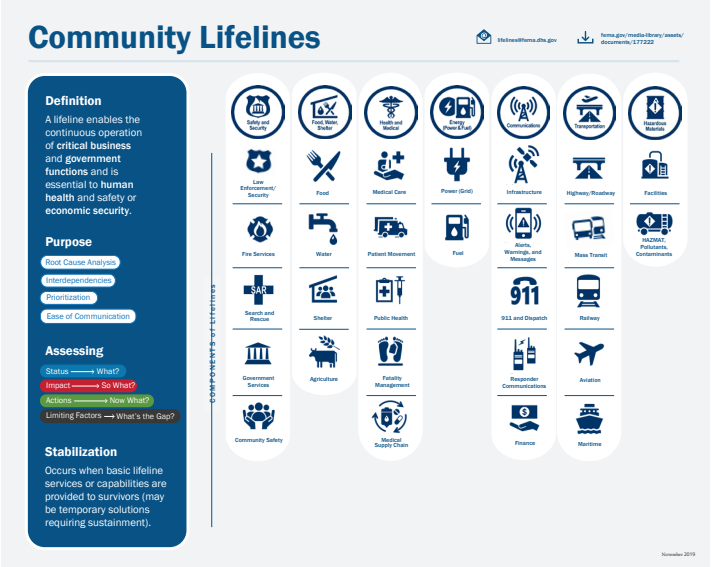
During responses to Hurricanes Michael, Florence, and Dorian these lifelines were validated and have since been refined and improved upon.

Community lifelines are a good starting point to provide basis for the most fundamental services that enable the community but, they are not the only assets that provide services and/or protection for the community. Therefore, natural infrastructure should be considered because it offers protection against shoreline erosion, flood protection, water purification, and more.

Why Natural Infrastructure?

Natural infrastructure includes areas and/or systems that provide multiple benefits for the environment including climate resilience, water purification, providing beneficial habitat for several species and more. It differs from "grey infrastructure" such as pipes, tunnels, which are constructed by humans; natural infrastructure is a form of "green infrastructure". Natural infrastructure includes wetlands, riparian buffers, forests, pastures, community gardens, green roofs, rain gardens, and more.

Natural infrastructure should be considered because it offers nature-based solutions for hazard mitigation and resiliency. The combination of both grey and green infrastructure offers a hybrid approach for hazard mitigation that results in environmental, economic and social co-benefits.



FEMA's Community Lifelines.

Natural Assets

Natural assets include wetlands, landscapes, areas of biodiversity, naturally occurring areas or systems, and areas that provide social-economic and health benefits for the overall community.

Rachel Carson Reserve

The islands of the Rachel Carson Reserve (Carrot Island, Town Marsh, Bird Shoal, and Horse Island) function as a protective storm barrier for the Town of Beaufort. The Reserve is located between the mouths of the Newport and North Rivers and across from Taylor Creek.

Coastal Wetlands

Coastal wetlands are located to adjacent to salt water and brackish water bodies. In Beaufort, coastal wetlands are located to the west along Wading Creek, Gable Creek, and Town Creek, and to the east along Newby Creek, Gibbs Creek, and Turner Creek, and to the south along Taylor Creek. Coastal wetlands surround the Rachel Carson Reserve. Coastal wetlands stabilize shorelines and provide storm and flood protection benefits.

Submerged Aquatic Vegetation (SAV)

Submerged aquatic vegetations offers critical forage for sea turtles, coastal birds, bay scallops, shrimp, hard clams, blue crabs, sea trout, gag grouper, flounder, and all life in the sound. It is a main food source for the West Indian Manatee found in the water around Beaufort.

State-identified Natural Heritage Natural Areas (NHNAs)

The Rachel Carson Reserves is state-identified natural heritage natural area. The Natural Heritage Area Program identifies site with terrestrial or aquatic significance due to the presence of rare species, natural communities, important animal assemblages, or other ecological features. The Rachel Carson Reserve is home to more than 200 species of birds, some that are considered rare or decreasing in numbers. The Reserve is important feeding area for Wilson's plovers in the summer and piping plovers in the winter. It is home to a diverse array of mammals including the river otter, gray fox, marsh rabbit, raccoon, and wild horses.

Areas of High Biodiversity

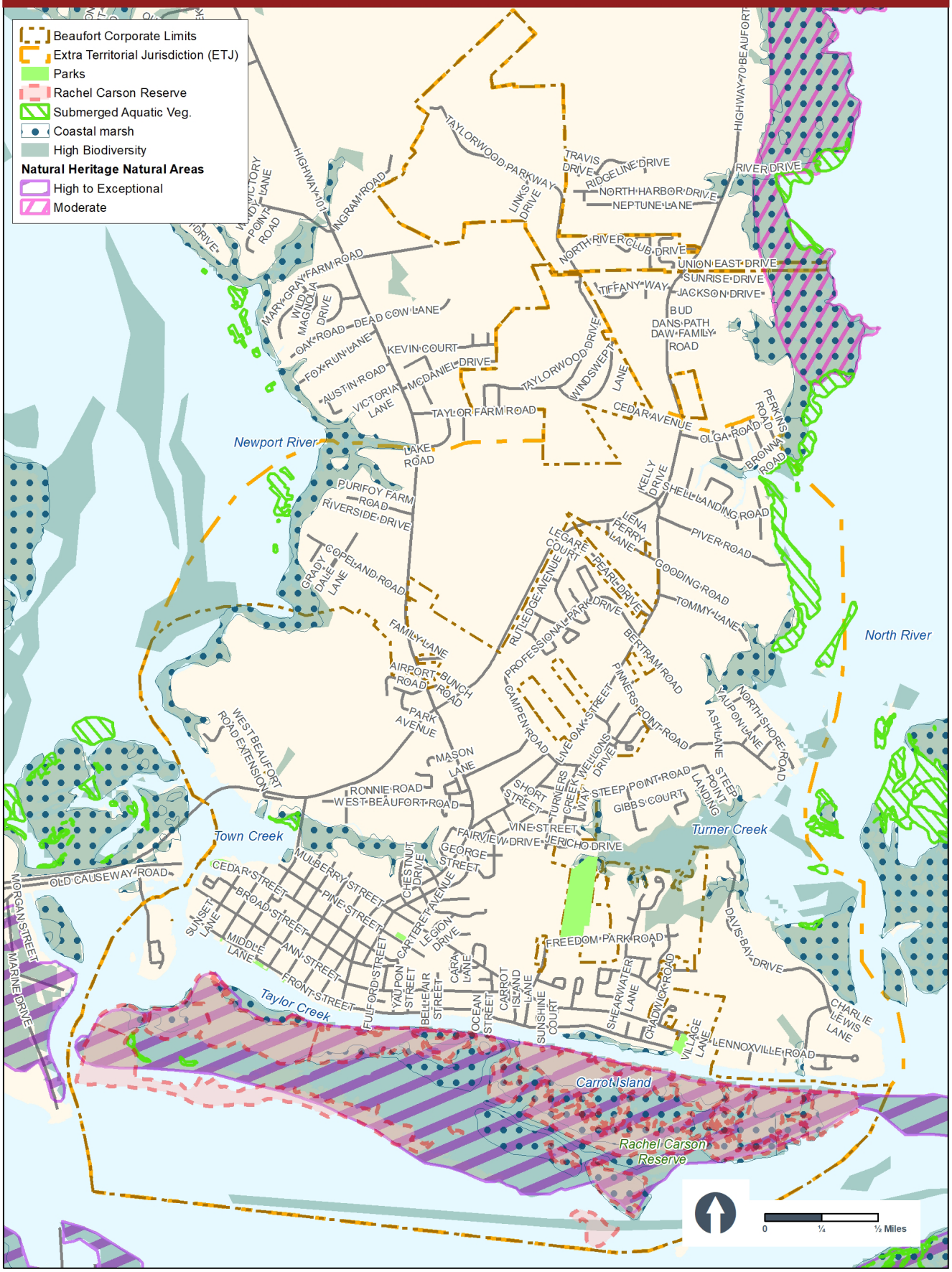
Areas of high biodiversity encompass the Town; these areas include vegetation that helps stabilize shorelines while providing beneficial habitat for juvenile fish and invertebrates.

Town Parks

The town's parks provide protection for green infrastructure, wildlife, and our most precious public resources, water, trees, and open spaces. They also provide crucial health and wellness opportunities for all populations in the community.

Grayden Paul Park.

Natural Assets



Supporting Infrastructure and Utilities

Public Drinking Water

Public drinking water in Beaufort is treated and distributed by the Water Division of the Public Utilities department. The Water Division operates two water treatment plans on Hendrick Street and Glenda Drive. It has a permitted flow rate of 1.2 million gallons per day and is responsible for 3,200 service connections. Water service is provided within the town's limits.

Wastewater Treatment

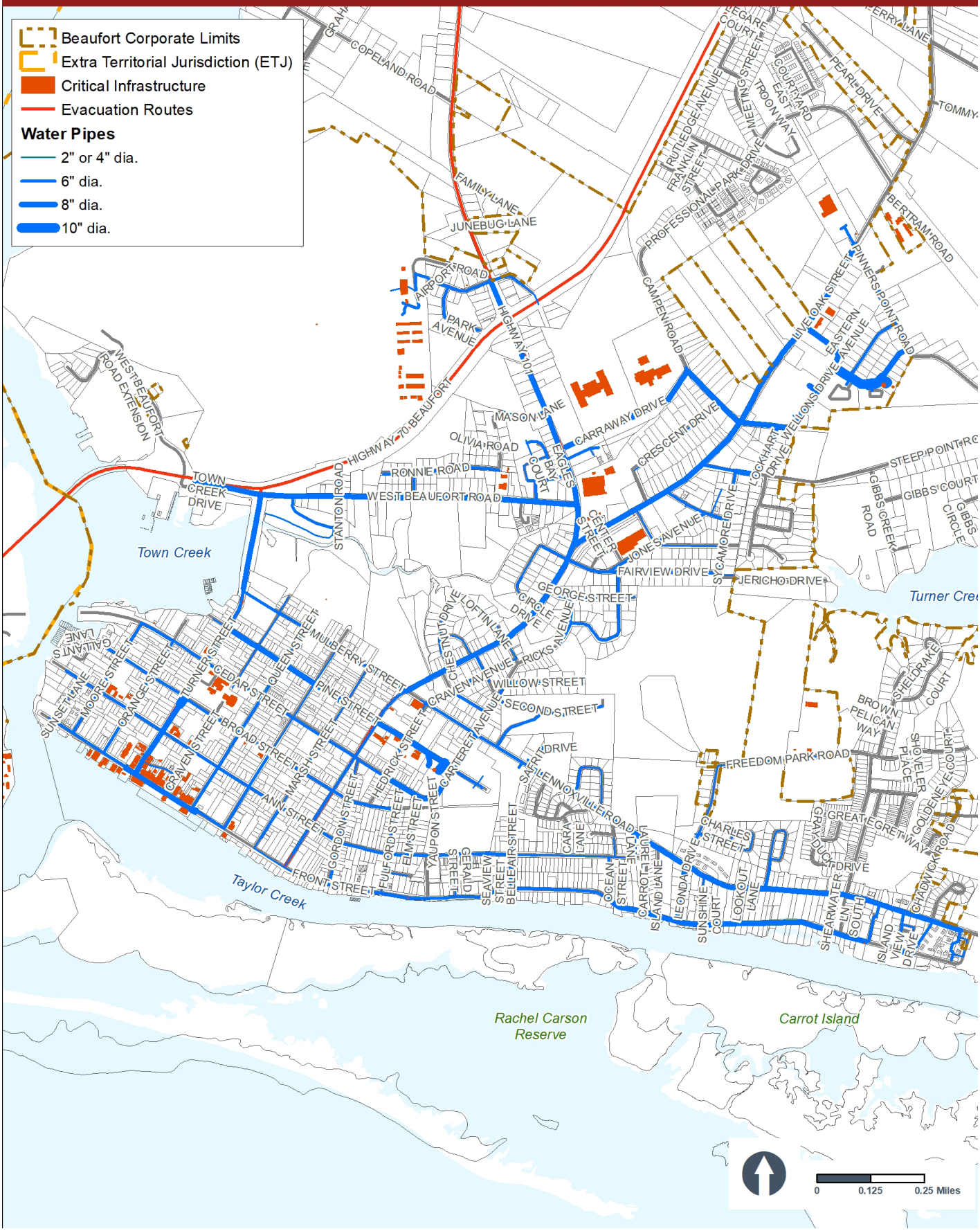
The sewer collection systems is approximately 25 miles of gravity lines, 28 miles of force mains, 21 pump stations, and approximately 3,330 sewer service connections. The Wastewater Treatment Plant (WWTP) is a permitted 1.5 million gallons per day facility treating the collected sewage from the Town. The WWTP discharges the effluent into the eastern end of Taylor's Creek, in accordance with state and federal regulations.

Stormwater Systems

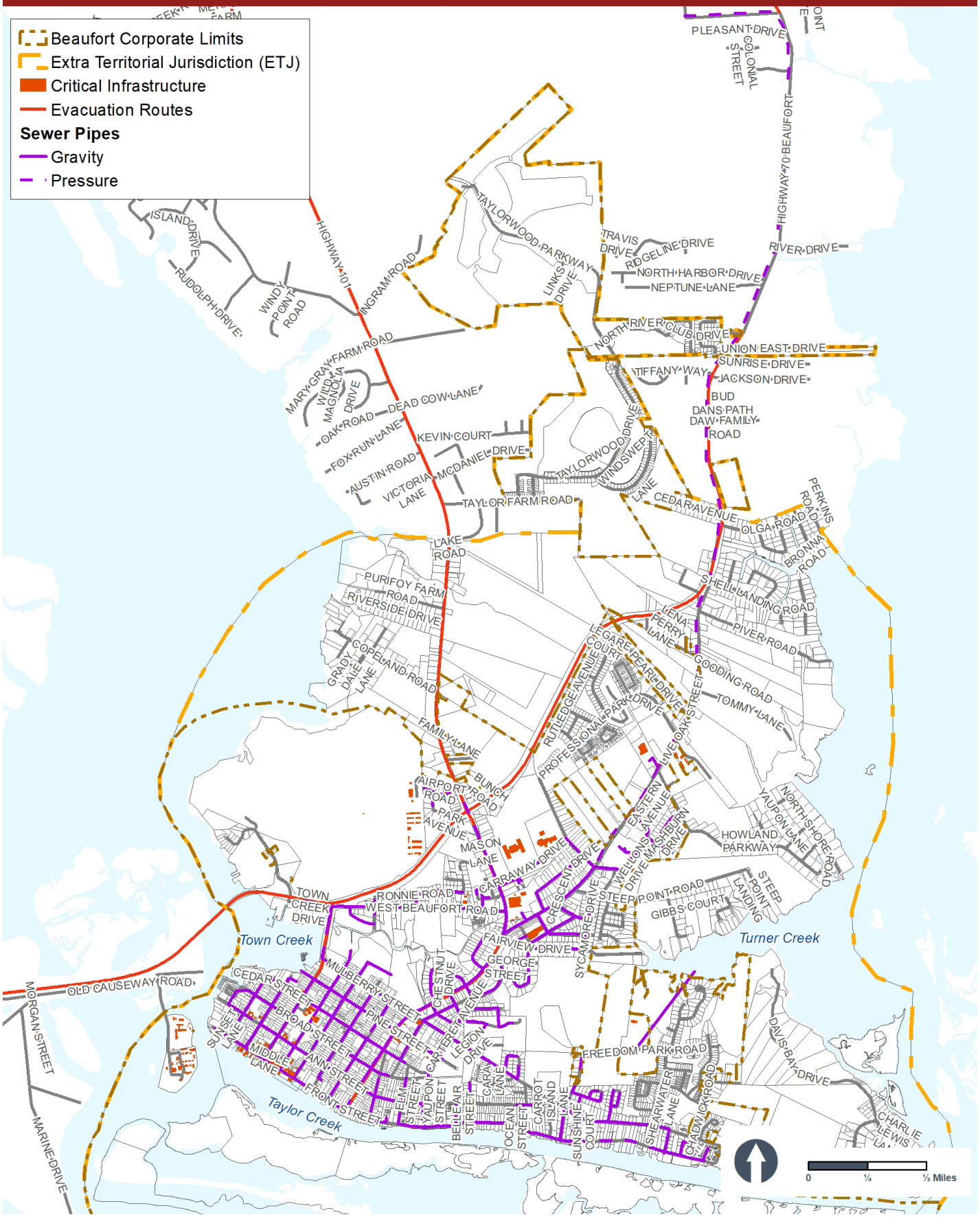
Stormwater runoff is carried to the Newport and North River through existing stormwater drainage facilities; these include a piping system, catch basins, drainage ditches, and swales.

Town of Beaufort, Public Works.

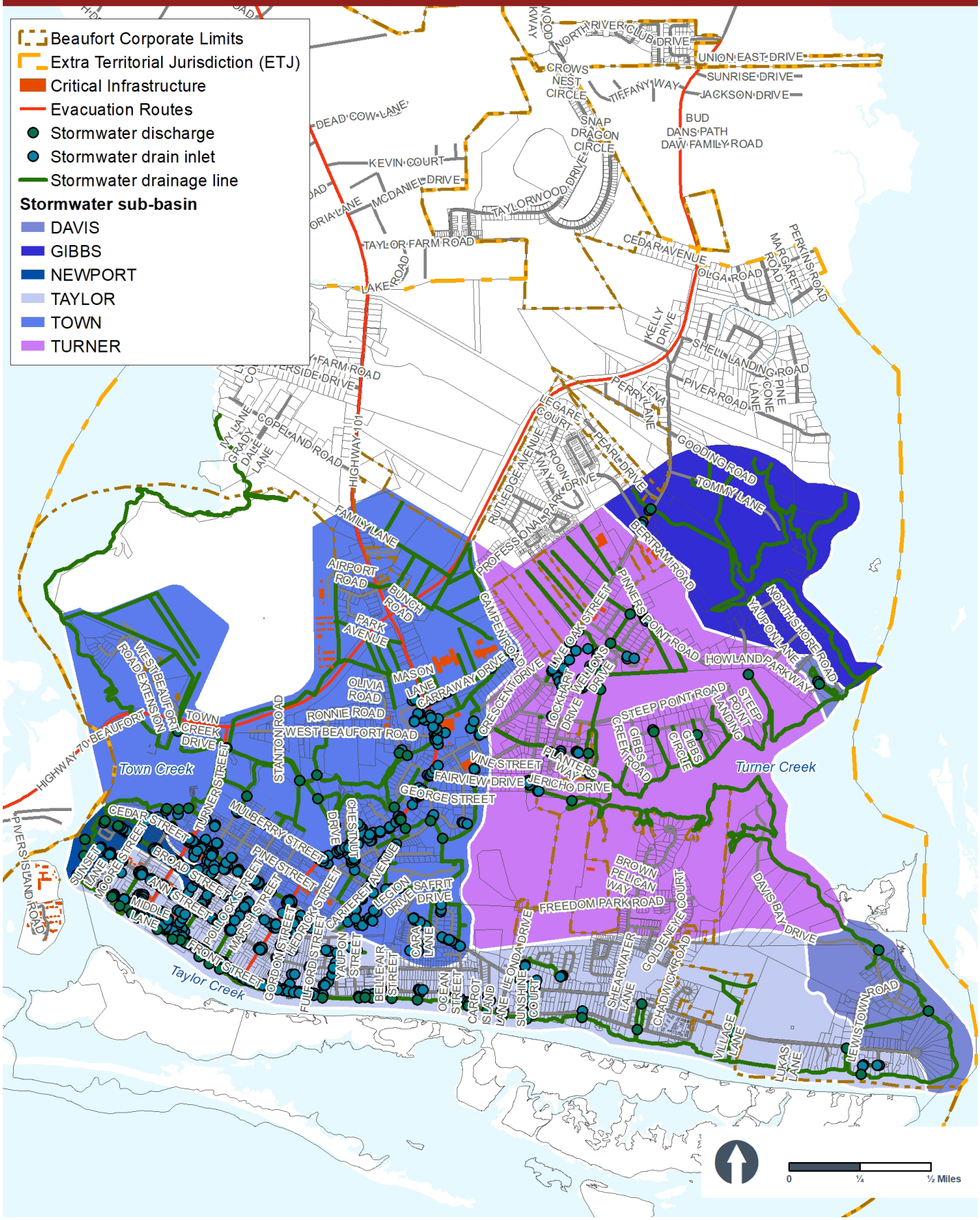
Water and Critical Infrastructure Assets



Sewer and Critical Infrastructure Assets



Stormwater Assets



Critical Infrastructure Assets

Critical infrastructure assets include community lifeline components and built infrastructure that provide socio-economical benefits to the community. Critical infrastructure assets are those that enable the continuous operation of critical government and business functions and are essential to human health, safety, and economic security.

These assets are mapped and categorized by asset type. The Critical Asset Type map (opposite page) identifies the location of evacuation routes, sewer pump stations, and critical infrastructure. Critical infrastructure is categorized by asset type.

Critical Infrastructure

- Emergency response (police, fire, EMS)
- Cell towers
- Gas and fueling stations
- Government services
- Evacuation routes
- Grocery / markets
- Telecommunications facilities
- Schools
- Post-disaster recovery sites and necessary businesses (churches, hardware)
- Major employment centers (downtown, Pivers Island, etc.)
- Tourism (downtown,parks)

Safety and Security - Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety

Food, Water, Shelter - Food, Water, Shelter, Agriculture

Health and Medical - Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management

Energy - Power Grid, Fuel

Communications - Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch

Transportation - Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime

Hazardous Material - Facilities, HAZMAT, Pollutants, Contaminants

Components of Community Lifelines, FEMA.

Critical Asset Type

Asset Summary

The following tables summarize the asset inventory areas identified as part of the critical asset inventory, and do not include all parcels, structures, or assets in the town.

Summary of Asset Ownership and Value	
Asset Ownership	**Estimated Value**
Private	$177,848,456
Public	$78,211,352
Total	**$256,059,808**

Summary of Asset Type and Value	
Asset Type	**Estimated Value**
Airport	$1,099,284
Building Supplies	$10,080,070
Communications	$83,124,336
Distribution Center	$8,678,878
Emergency Services	$3,343,278
Employment / Research	$51,898,930
Energy (fuel)	$485,738
Food	$464,299
Government Services	$870,126
Grocery	$2,009,800
School	$10,033,367
Sewer	$8,460,578
Tiller Elem. School	$640,322
Tourism / Economy	$26,451,562
Water	$48,419,240
Total	**$256,059,808**

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5 Vulnerability

Hazard Identification

Local Hazard Mitigation Planning

The Resilient Coastal Communities Program (RCCP) Handbook stipulates that local hazard mitigation planning should serve as the primary basis for the risk and vulnerability assessment. Beaufort participated in the 2020 Pamlico Sound Regional Hazard Mitigation Plan, which has been reviewed on page 19. This plan identified the primary hazards for the area as hurricanes and tropical storms, flooding, severe winter storms, and severe weather such as thunderstorms, wind, lightning, and hail. These primary hazards were used to determine the final list of hazards that will be used for the vulnerability assessment.

Identified Hazards for the Vulnerability Assessment

The RCCP Handbook requires that at a minimum the assessment must consider flooding (rainfall, tidal, and riverine), storm surge, and sea level rise. The program specifies that the minimum sea level rise projection used must be at least 30 years in the future. Note that even though this is the stated minimum for the RCCP plan, seas will continue to rise for many decades afterwards even if humans immediately achieved climate action goals. To create a comprehensive and locally-relevant list of hazards, the project team first reviewed the local Hazard Mitigation Plan and supplemented it using input from the Community Action Team. Hazards used for this assessment are:

- **Sea Level Rise (using a minimum 30-year projection)**
- **Flooding (from storms and rainfall)**
- **Tidal and/or riverine flooding**
- **Storm Surge**

Sea Level Rise and Flooding Hazards – Preliminary Findings and Discussion

Definitions and Measurements

- Grade is measured above sea level.
- Finished grade is the average grade of the highest and lowest points at the building line.
- Base Flood Elevation is flood level for the 1% annual flood chance storm + wave action, measured above sea level.
- Sea Level Rise is calculated above sea height, as recorded for the year 2000, for NOAA SLR projections.

In the Risk and Vulnerability Assessment that is part of the RCCP, it is necessary to determine a scenario to use for sea level rise and flooding in the future.

The majority of structures constructed today in Beaufort will exceed a lifespan of 50 years (equivalent to the year 2071 and beyond). This typically includes most residential and nonresidential buildings, retaining walls, and culverts. Sturdy structures and major infrastructure investments, such as bridges, water and wastewater treatment plants, sewer infrastructure, and streets, can have expected lifespans of up to 100 years (equivalent to year 2121). Some structures in the Town have existed for much longer than 100 years.

NOAA's Technical Report NOS CO-OPS 086 outlines several scenarios for future sea level rise and future flooding days. These range from a Low Scenario (which uses historic tide gauge data and extrapolates almost linearly forward in time) to an Extreme Scenario (which is the worst-of-the-worst in a future where humanity continues to generate massive amounts of climate warming gases).

The 2020 NC Climate Science Report outlines a "likely" future for Beaufort, which means that there is a 67% chance or higher that this will occur. This scenario is bounded by the Intermediate Low and Intermediate Scenarios. In this report, it is suggested that the Town will experience up to 2 feet of sea level rise by 2060 and between 2 feet and 4 feet of sea level rise by 2100.

The Town is in the process of adopting a Comprehensive Plan that identifies high risk coastal areas as approximating the 1% annual chance floodplain (aka the FEMA Special Flood Hazard Area). This area equates to approximately 6' of sea level rise, which is just a little shy of the Intermediate-High Scenario at year 2100.

The following scenarios were considered by the steering committee in determining the sea level rise projection to use in this planning process:

2 feet of sea level rise

» Approximates the Intermediate Scenario at year 2060 and the Intermediate Low Scenario at year 2100.

» Roughly equivalent to 25 more days of high tide flooding in year 2060 and 250 more days of high tide flooding in year 2100.

» Of the three proposed options, this is the most likely to occur and is the least mitigating of future flood risk, especially during extreme storm events.

4 feet of sea level rise

» Approximates the Intermediate Scenario at year 2100.

» Roughly equivalent to 250 more days of high tide flooding in year 2060 and daily high tide flooding in year 2080 and beyond.

6 feet of sea level rise

» Approximates the Intermediate High Scenario and the 1% annual chance floodplain (i.e. – the FEMA Special Flood Hazard Area) and the proposed Non-Intensification Zone in the Town's draft Comprehensive Plan.

» Roughly equivalent to daily high tide flooding in year 2060 and beyond.

» Of the three proposed options this is the least likely to occur and is the most cautious in terms of reducing future flood risk, even during extreme storm events.

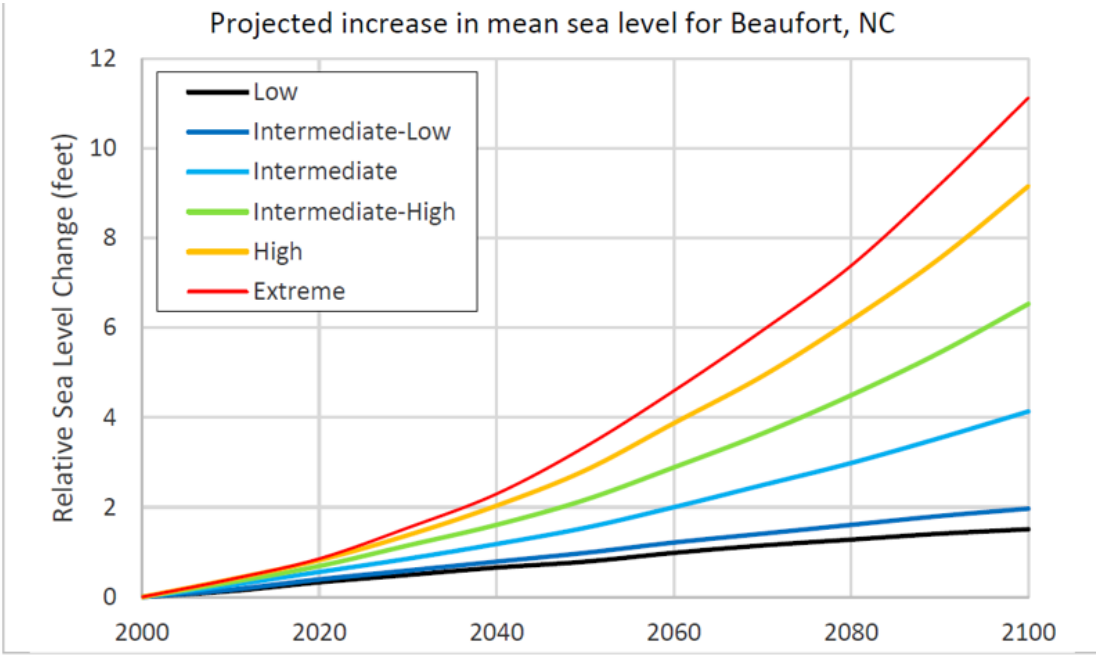
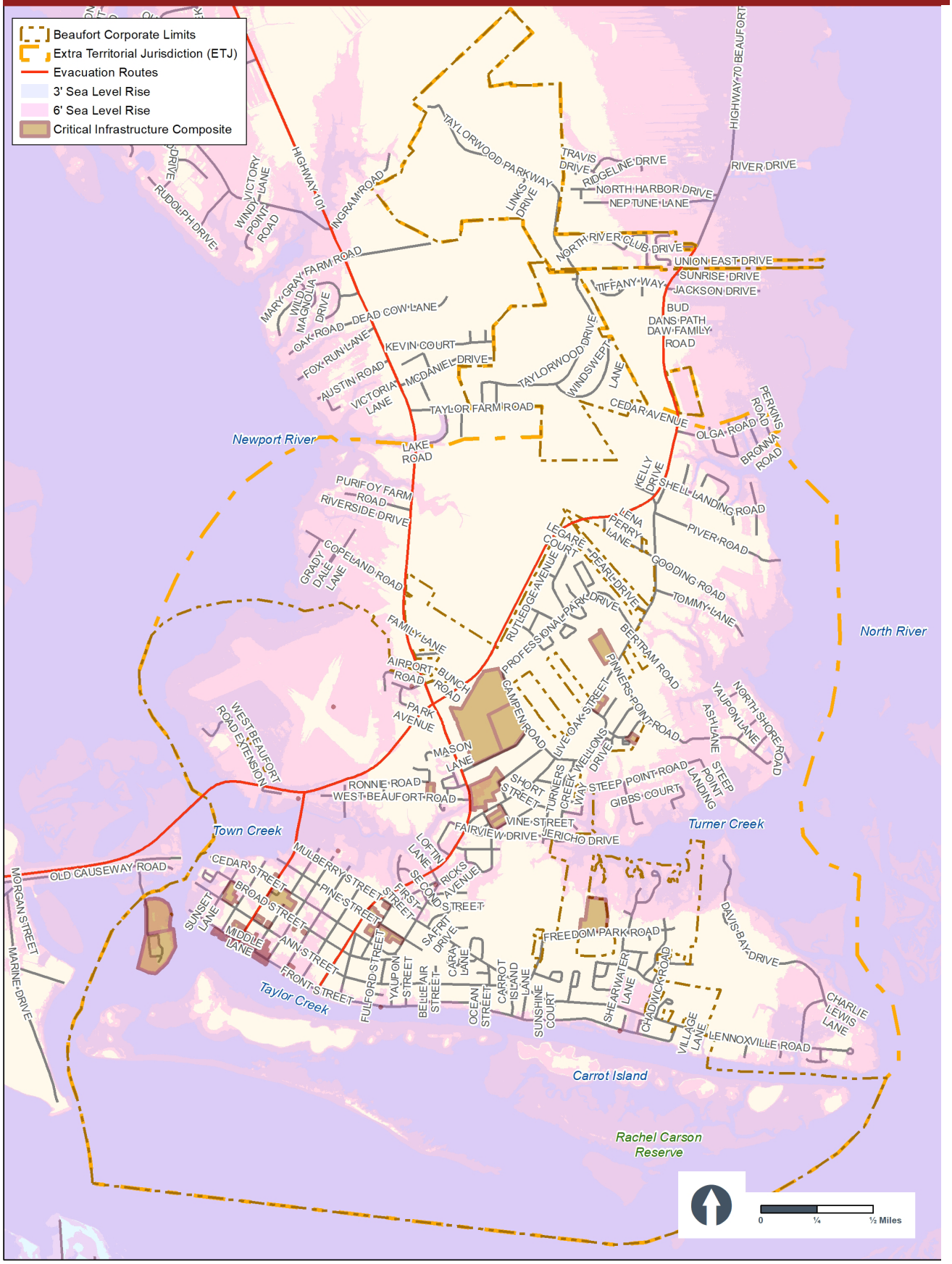


Figure 1: Graph shows relative sea level change scenarios for Beaufort, NC associated with the six different global sea level rise scenarios. The low and extreme scenarios represent the minimum and maximum of plausible future sea level rise. Data source: NOAA Technical Report NOS CO-OPS 083; Site: 2295.

3′ and 6′ Sea Level Rise Inundation



Environmental Vulnerabilities

Sea Level Rise

A fifty year Sea Level Rise (SLR) horizon was determined to be relevant to the local conditions, such as development patterns and expected structure lifespans. Based on NOAA projections (base year 2000), a 3-foot sea level rise corresponds with the intermediate scenario for ~50 years out (year 2070-2080). Interestingly, the 3' SLR scenario also corresponds roughly to high tide, wind-driven flooding that downtown Front Street experienced recently (Nov. 2021 and Jan. 2022), which makes this scenario particularly relevant.

Using the 3' SLR scenario and the critical infrastructure assets dataset, the vulnerability of assets was categorized. Assets were grouped into three groups based on height above (or below) the future water level, based on their Finished Floor Elevation. A two-foot freeboard was used because this is a recommended state minimum for flood protection.

Sea Level Rise Vulnerability

When compared to the 3' of sea level rise scenario:

- 3 = highest vulnerability, Finished Floor Elevation (FFE) is at or below projected water level
- 2 = moderate vulnerability, FFE has less than 2' freeboard remaining
- 1 = lowest vulnerability, FFE has greater than 2' freeboard remaining

Tidal Flooding

As sea levels rise, nuisance flooding will become a chronic condition. Projections estimate Beaufort will experience over 30 tidal flooding event per year by 2060 and over 100 tidal flooding events per year by 2080. Beaufort already experiences historic tidal crests that bring flooding to Downtown and beyond.

Demonstrated Flooding

Since 1964, the NOAA Beaufort tide gauge has recorded water level data. Of the top 17 historic crests, ten of them have occurred with the past ten years. Two of the top 10 historic crests occurred on November 8, 2021 and January 3, 2022. Both of these events resulted in inundation on Front Street in the historic downtown, as well as other parts of town that are not typically subject to tidal flooding.

The November 2021 flooding coincided with a predicted king tide event and the January 2022 flooding coincided with a strong wind storm that drove wind into the Beaufort area at the same time as a predicted higher water level event that was not considered a king tide. (Source: UNC Chapel Hill, NC King Tides Project, https://nckingtides.web.unc.edu/)

Flooding Vulnerability

Tidal flooding scenarios are the same as Sea Level Rise, but using 6' SLR scenario. The 6' scenario is roughly equivalent to the 3' of SLR plus the 3' typical tidal amplitude that occurs in Beaufort. The 6' SLR scenario also corresponds

Historic Water Level Crests

1. 7.28 ft on 09/14/2018
2. 6.94 ft on 09/19/1955
3. 6.94 ft on 10/15/1954
4. 6.56 ft on 09/14/2005
5. 6.44 ft on 09/12/1960
6. 6.38 ft on 01/03/2022
7. 6.30 ft on 09/16/1999
8. 6.26 ft on 08/27/2011
9. 6.13 ft on 09/06/1996
10. 6.04 ft on 11/08/2021
11. 5.92 ft on 10/04/2015
12. 5.84 ft on 08/07/1955
13. 5.79 ft on 01/01/1987
14. 5.72 ft on 11/18/2019
15. 5.47 ft on 12/16/2020
16. 5.35 ft on 10/09/2013
17. 4.92 ft on 07/04/2014

Flooding on Front Street, November 2021

with NOAA's High scenario for year 2080 (about 50 years out). As such, this scenario functions well as a tool for exploring less optimistic SLR scenarios for Beaufort. It is also likely that the Town will see 6' of SLR in the distant future, so it can also help in very long-range asset management and planning.

Using the 6' SLR scenario and the critical infrastructure assets dataset, the vulnerability of assets was categorized. Using Finished Floor Elevation, assets were grouped into three groups based on height above (or below) the future water level.

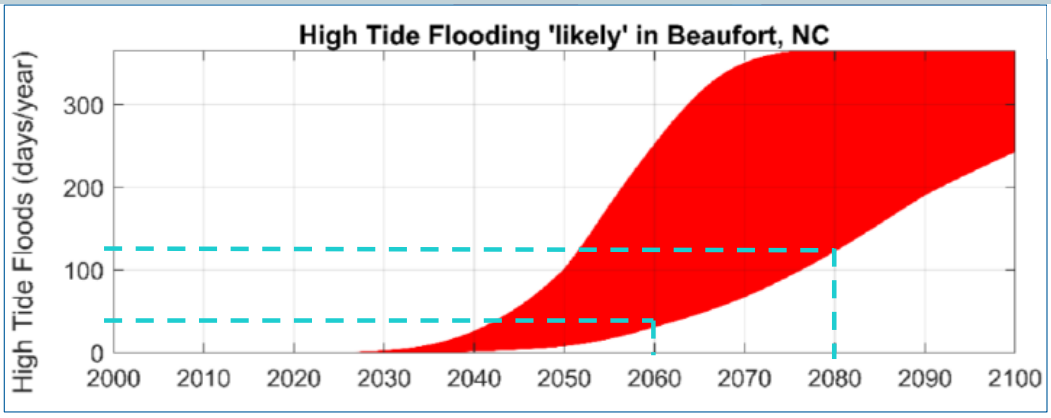
Tidal Flooding Vulnerability

When compared to the 6' sea level rise scenario (i.e. - 3' of sea level rise + 3' of tidal action):

- 3 = highest vulnerability, Finished Floor Elevation (FFE) at or below projected water level
- 2 = moderate vulnerability, FFE less than 2' freeboard remaining
- 1 = lowest vulnerability, FFE greater than 2' freeboard remaining

Projected Flooding

- As seas rise, nuisance flooding will be chronic
- Over 30 tidal flooding events per year by 2060
- Over 100 tidal flooding events per year by 2080



This graph shows the corresponding number of high tide flood days considering only RSL rise and present astronomical tides. High tide flood days for Beaufort are defined as reaching water levels 1.8 ft above present Mean Higher High Water (Sweet et al. 2018). This figure courtesy of W. Sweet.

Rainfall

The NC Climate Science Report projects an increase in precipitation across the state as greenhouse gases increase throughout the 21st Century. Under both the higher and lower scenarios for greenhouse gas emissions, increases of up to about 3% in annual total precipitation is projected for the periods from 2021-2040 and 2040-2060 in the Beaufort area. This 3% increase will exasperate stormwater mitigation measures in this already wet area. The Report also projects an increase in extreme precipitation events across the state, which are defined as days on which rainfall totals 3 inches or more. All of these projected increases further expose Beaufort to storm surge-related hazards.

Flooding vulnerability approximates the potential impact of future rainfall and storm events that are not associated with coastal vulnerability. It is estimated that about 30% of structure value in the Town is within the horizontal boundaries of the 100-year floodplain, not including the airport. As shown by the map to the right, an additional three feet of sea level rise will lead to almost the entire town being within the special flood hazard area. The vulnerability assessment takes into account projected inundation and future SFHA.

According to the Pamlico Sound HMP, 24.5% of the population is at risk of flood hazards.

Flooding Vulnerability

Using the future modeled 1% annual flood chance area developed by NC Dept. of Emergency Management:

- 3 = highest vulnerability, inundated or within the future Special Flood Hazard Area (SFHA) and with less than 2' of freeboard at the 6' Sea Level Rise (SLR) scenario
- 2 = moderate vulnerability, in the future SFHA but also with less than 2' of freeboard at the 6' SLR scenario
- 1 = lowest vulnerability, not in the future SFHA

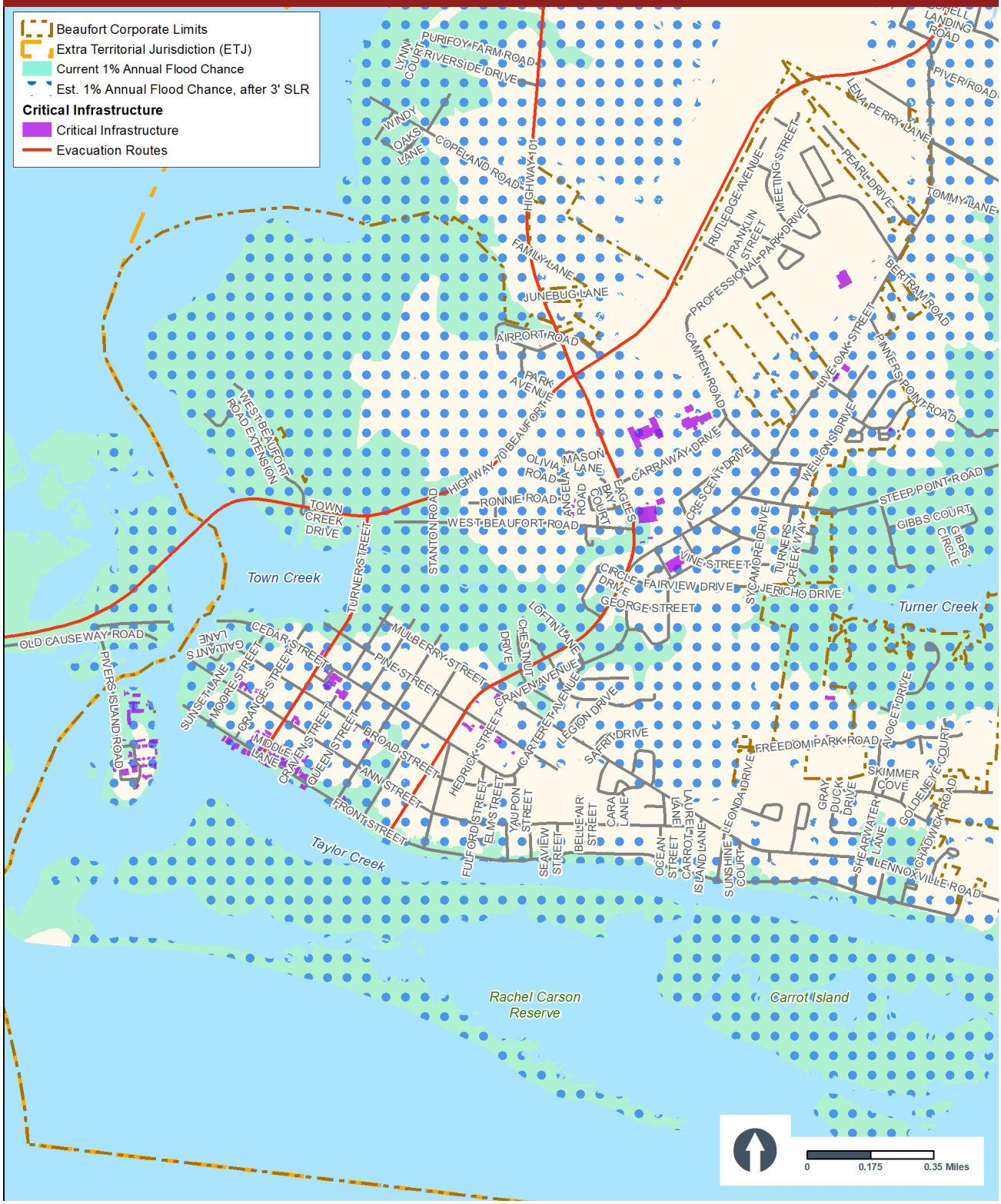
Freshwater flooding

The project team obtained data from the NC Emergency Management that models what the future Special Flood Hazard Area (1% annual flood chance) floodplain might look like after 3' of sea level rise. This was used to approximate the vulnerability of critical asset structures to future floodplain conditions. See vulnerability ranking below.

Probability of <u>at least</u> one storm event within the timeframe

Storm Event Intensity	1 Year	10 Years	30 Years	50 Years	100 Years
1-in-10 year	10.0%	65.1%	95.8%	99.5%	99.9%
1-in-50 year	2.0%	18.3%	45.5%	63.6%	86.7%
1% Annual Chance	1.0%	9.6%	**26.0%**	39.5%	63.4%
0.2% Annual Chance	0.2%	2.0%	5.8%	9.5%	18.1%
1-in-1,000 year	0.1%	1.0%	3.0%	4.9%	9.5%
			Length of typical mortgage	*Within lifespan of most structures*	*Within lifespan of sturdy structures*

Modeled Future Special Flood Hazard Area



Source: North Carolina Department of Emergency Management

Storm Surge

The 2020 North Carolina Climate Science Report identifies that it is "virtually certain" that coastal storm surge flooding events will increase. The vulnerability scores are based on the National Weather Service (NWS) Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model to understand potential inundation during hurricanes of varying intensity. As evidenced from map, virtually all of Beaufort is susceptible to inundation due to storm surge at a Category 3 hurricane or higher intensity.

Storm Surge Vulnerability

- Using the National Weather Service (NWS) Storm, Lake, and Overland Surges from Hurricanes (SLOSH) model:
- 3 = highest vulnerability, susceptible to flooding in Category 1 hurricanes
- 2 = moderate vulnerability, susceptible to flooding in Category 2 hurricanes
- 1 = lowest vulnerability, susceptible to flooding in hurricanes strengths of Categories 3-5

Additional Potential Vulnerabilities Not Included in this Assessment

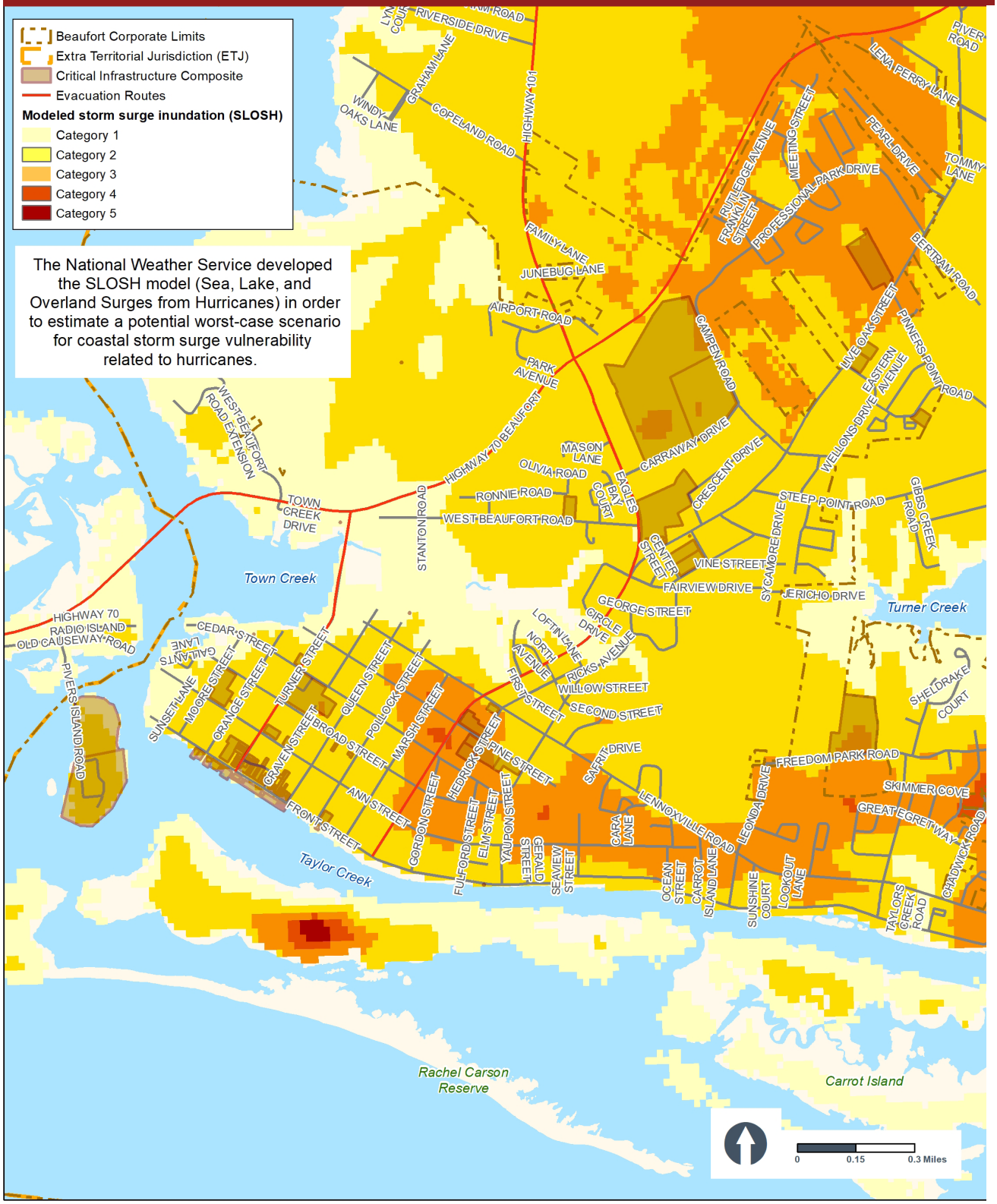
Erosion

Due to the system of islands that surround the Town, Beaufort is fortunate not to be exposed to direct ocean wave impacts. Most shoreline erosion seems to be caused by storm events or wake from boats. Dredging of navigational channels also has the possibility of increasing erosive effects on nearby shorelines. At the time of writing, there was no data available related to long term shoreline erosion. In the future, if the inlet opens up dramatically, or the Rachel Carson Reserve is permanently inundated due to sea level rise, the Town may become more exposed to wave induced erosion.

Salt Water Intrusion into Groundwater

The risk of saltwater intrusion into groundwater resources is likely as sea level rise continues. Data of the specificity necessary to evaluate this potential threat properly does not currently exist.

Storm Surge Inundation



Source: National Weather Service.

Composite Vulnerability

The vulnerability composite amalgamates all assigned vulnerability scores from the assigned hazard values. This is a simple additive model, combining the vulnerability rankings for the four identified hazards (3' sea level rise, tidal flooding (i.e. - 6' sea level rise), storm surge, and rainfall flooding) into a single composite vulnerability score. Higher values identify assets that are highly vulnerable to many hazards. This might also be considered a sensitivity ranking. The assets around downtown, Front Street, and on Pivers Island have the highest composite vulnerability scores.

Summary of Composite Vulnerability and Value	
Composite Vulnerability	**Estimated Value**
4 (Lower)	$5,986,058
5	$30,932,525
6	$183,604,029
7	$8,957,523
8	$10,226,108
9	$5,552,850
10	$4,365,833
11 (Higher)	$6,434,882
Total	**$256,059,808**

Adaptive Capacity

Not all assets or locations are created equally. Differences in location, design, and hazard vulnerability type mean that some assets are more or less capable of adapting to future conditions than others. For instance, while a water tower may be relocated to higher ground, the water, sewer, and stormwater pipes under town streets will likely not be possible to relocate until all private development that they serve has relocated or been abandoned. In a more locally specific instance, the sewer lift stations scheduled for major upgrades in the next 10 years can likely easily have some additional hazard mitigation features installed concurrently with that regularly scheduled maintenance. The additional cost would be much lower than the overall cost of the other upgrades and the mobilization costs would be minimal since other major work would already be underway.

Composite Vulnerability

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.

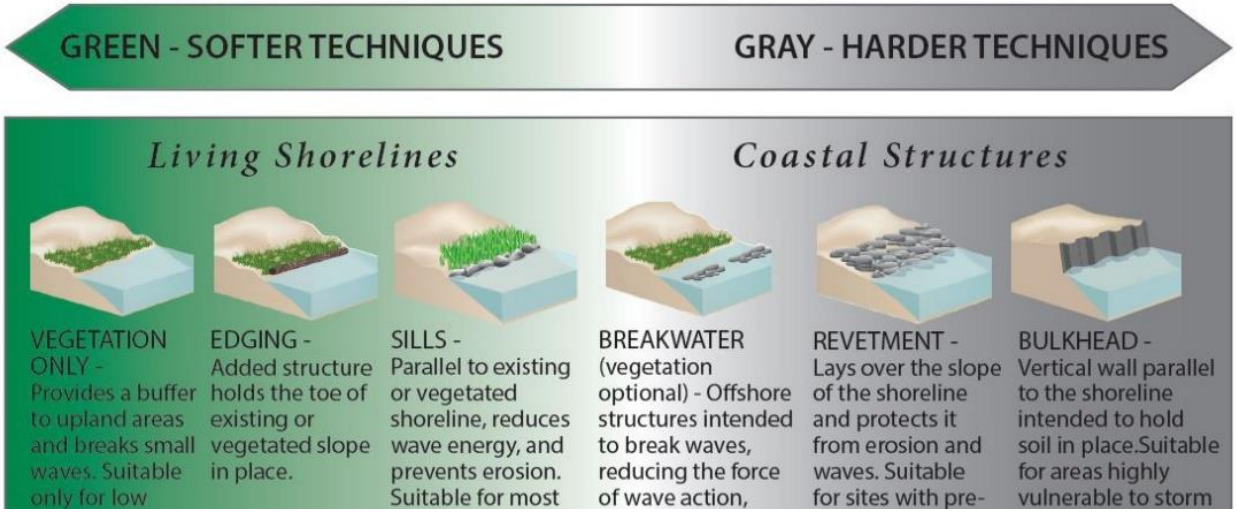
Floodplain Management Plan	
Project Description	Develop a Floodplain Management Plan or Program that comprehensively addresses flooding in the community. This is a credited activity under the Community Rating System. Extra credit is provided for plans that address the natural resources of floodplains 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

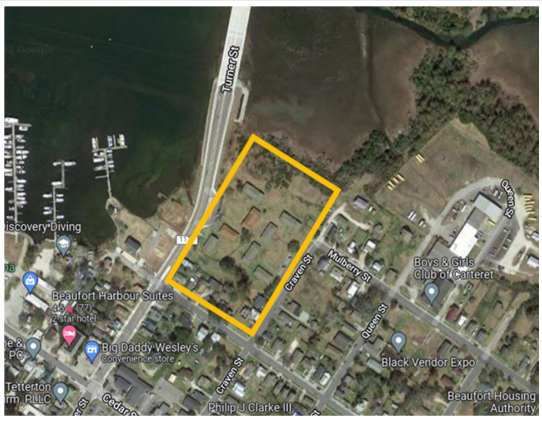
Prioritization Measures

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

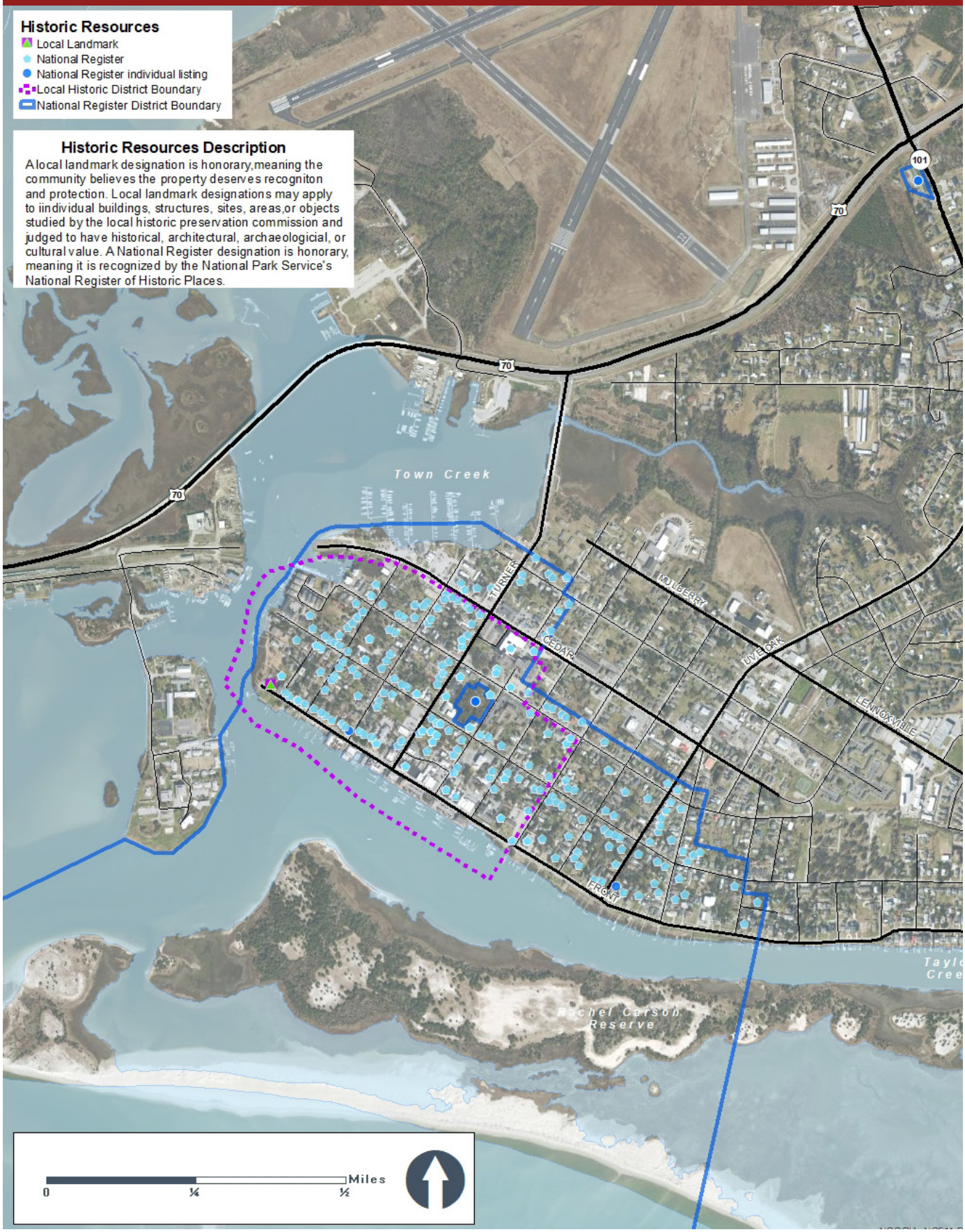
Gallant's Channel Living Shoreline	
Project Description	Gallant's Point and adjacent areas along Gallant's Channel, including the Michael J. Smith Airport and the NC Maritime Museum's property, are at risk of erosion, storm surge, tidal flooding, and sea level rise. This area would likely benefit from 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



Appendix

GIS Fields Metadata

Most fields in the GIS database associated with this project are taken from a combination of the North Carolina Emergency Management (NCEM) building polygon dataset, the County's tax parcel polygon dataset, and the Town's infrastructure (sewer pump station) point dataset. See the data originator for explanation of fields unique to those data. Fields that were generated or modified unique to this project are detailed in the table below as well as in the metadata within the GIS layer itself.

Data Transformations

- The building polygon dataset was spatially joined with the tax parcel dataset to join the information from the tax parcel dataset into the building polygon dataset.
- In order to combine the sewer pump station point dataset with the building polygon dataset, the pump stations were buffered by a 10' radius and merged to the building polygon dataset. Thus, any area calculations for this asset is an estimate.

GIS Field Name	Long Name	Description	Notes
FFE	Finished Floor Elevation, in feet	Describes the height of the lowest habitable floor above sea level, in feet.	Where there was not a habitable structure with a FFE (like for sewer pump stations), the average value for the DEM (Digital Elevation Model) was utilized. For sewer pump stations, = Ht_DEM.
FreeBd3ft	Freeboard remaining, in feet, after Sea Level Rise (SLR) of 3'	Height of the finished floor above a SLR of 3'. = FFE minus 3.	Negative values indicate inundation. Where no habitable structure is present (as with sewer pump stations) the Ht_DEM was used to determine "freeboard".
FreeBd6ft	Freeboard remaining, in feet, after Sea Level Rise (SLR) of 6'	Height of the finished floor above a SLR of 6'. = FFE minus 6.	Negative values indicate inundation. Where no habitable structure is present (as with sewer pump stations) the Ht_DEM was used to determine "freeboard".
Latitude		Latitude, in feet	
Longitute		Longitude, in feet.	
Asset_Type		Assets categorized by type	
Ownership		Public or private.	

GIS Field Name	Long Name	Description	Notes
Estd_value	Estimated replacement value, in dollars	Total estimated value minus land value. =Total_EMV minus LAND_VALUE	Sewer pump stations had no data available, so $150,000 was used. This may be updated later.
Name1		A more detailed, locally significant description of the facility type.	
Acres1	Area, in acres		
SqFeet1	Area, in square feet		Except for sewer pump stations (which show the area of their 10' radius buffer), these refer to the parcel data that was spatially merged with the building polygon layer. For building footprint or area, see HtdSqFt.
FLd100yr	Intersection with the 1% annual flood chance horizontal floodplain	Yes = the asset does intersect the 1% annual chance floodplain horizontal boundaries. No = it doesn't.	
FLd500yr	Intersection with the 0.2% annual flood chance horizontal floodplain	Yes = the asset does intersect the 0.2% annual chance floodplain horizontal boundaries. No = it doesn't.	
Ht_DEM	Height of the average elevation above sea level of the Digital Elevation Model, in feet.	Used for sewer pump stations and other non-habitable assets when no FFE was provided.	When a parcel had a valid FFE value, no Ht_DEM was recorded and FFE was used instead.
SLR0ft	Inundated or intersected by the sea at 0 feet of SLR	Yes or No.	
SLR3ft	Inundated or intersected by the sea at 3 feet of SLR	Yes or No.	3' of SLR corresponds to the anticipated sea level rise in 50 years using the NOAA Intermediate Scenario.

GIS Field Name	Long Name	Description	Notes
SLR6ft	Inundated or intersected by the sea at 6 feet of SLR	Yes or No.	6’ of SLR corresponds to the anticipated typical high tide on top of the 3’ of sea level rise anticipated in the NOAA Intermediate Scenario. This is also equal to the anticipated sea level rise in 50 years using the NOAA High Scenario, so it functions as an upper bound for expected SLR.
BldgPresent	Presence of a habitable structure	Yes or No.	
Fld_3FtSFHA	Inundated or intersected by the anticipated 1% annual flood chance storm after 3’ of SLR.	Yes or No.	Uses the NCEM dataset that explores what the future 1% annual flood chance area (Special Flood Hazard Area) might resemble after 3 feet of sea level rise.
Vul_SLR3	Vulnerability to sea level rise of 3’.	3=highest (FFE at or below projected SLR water level, zero or lower); 2=moderate (FFE between zero to 2’ remaining); 1=low (greater than 2’ of freeboard remaining)	3’ of SLR corresponds to the anticipated sea level rise in 50 years using the NOAA Intermediate Scenario. Freeboard of 2’ corresponds to the minimum required freeboard in the Special Flood Hazard Area (SFHA).
Vul_tide	Vulnerability to typical tides after 3’ of SLR; equivalent to the 6’ SLR scenario	3=highest (FFE at or below projected SLR water level, zero or lower); 2=moderate (FFE between zero to 2’ remaining); 1=low (greater than 2’ of freeboard remaining)	6’ of SLR corresponds to the anticipated typical high tide on top of the 3’ of sea level rise anticipated in the NOAA Intermediate Scenario. This is also equal to the anticipated sea level rise in 50 years using the NOAA High Scenario, so it functions as an upper bound for expected SLR. Freeboard of 2’ corresponds to the minimum required freeboard in the Special Flood Hazard Area (SFHA).

GIS Field Name	Long Name	Description	Notes
Vul_surge	Vulnerability to storm surge from hurricanes and coastal storms	3=highest (susceptible to flooding in Category 1 hurricanes); 2=moderate (susceptible to flooding in Category 2 hurricanes); 1=low (susceptible to flooding in Category 3-5 hurricanes)	Uses National Weather Service SLOSH model to understand potential inundation expected during hurricanes of varying intensity, based on worst-case directional approach.
Vul_3FtSFHA	Vulnerability to flooding during the 1% annual flood chance storm, after 3' of SLR	3=highest (inundated or within the future SFHA and with less than 2' of freeboard at the 6' SLR scenario); 2=moderate (in the future SFHA, but also with at least 2' of freeboard at the 6' SLR scenario); 1=low (not in the future SFHA)	This approximates the potential impact of future rainfall and storm events that are not associated with coastal vulnerability. Uses the NCEM dataset that explores what the future 1% annual flood chance area (Special Flood Hazard Area) might resemble after 3 feet of sea level rise.
Vul_Comp	Composite Vulnerability	Mathematical sum of all Vulnerability measurements. = Vul_SLR3 + Vul_tide + Vul_surge + Vul_3FtSFHA	To assist in prioritizing by vulnerability, which does not necessarily correlate with operational importance or community importance. This is essentially the Sensitivity Score (RCCP Handbook p. 17).

Table of Assets and Vulnerabilities

The following table describes the information collected related to infrastructure asset characteristics, vulnerability, and other data generated during this project. It is possible that more up-to-date information is available with the Town of Beaufort Planning Department.

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
1	Communication	Cell Tower	34.72036270	76.66270484	CARTERET COUNTY COURTHOUSE	Private	8.85	5.85	2.85
2	Tourism / Economy	Downtown Commercial	34.71710120	76.66511692	GENE LEWIS PROPERTIES LLC	Private	6.34	3.34	0.34
3	Emergency Services	Police Department	34.71755985	76.66078830	TOWN OF BEAUFORT	Private	9.18	6.18	3.18
4	Grocery	Market	34.71803115	76.66136515	PAERL,BARBARA H ETVIR HANS W	Private	8.76	5.76	2.76
5	Tourism / Economy	Downtown Commercial	34.71744465	76.66489452	GENE LEWIS PROPERTIES LLC	Private	9.49	6.49	3.49
6	Emergency Services	EMS / Ambulance	34.72676500	76.65057723	BEAUFORT RESCUE SQUAD	Private	10.30	7.30	4.30
7	Emergency Services	EMS / Ambulance	34.72699510	76.65040899	BEAUFORT RESCUE SQUAD	Private	11.61	8.61	5.61
8	School	School	34.72965698	76.64690100	COUNTY OF CARTERET	Public	12.37	9.37	6.37
9	School	School	34.73001633	76.64477442	COUNTY OF CARTERET	Public	13.66	10.66	7.66
10	Distribution Center	Episcopal Church	34.71968843	76.66603272	ST PAULS EPISCOPAL CHURCH	Private	11.00	8.00	5.00
11	Distribution Center	Episcopal Church	34.71960461	76.66613044	ST PAULS EPISCOPAL CHURCH	Private	11.31	8.31	5.31
12	Tourism / Economy	Downtown Commercial	34.71769756	76.66564606	BEAUFORT HISTORICAL ASSOCIATIO	Private	9.77	6.77	3.77
13	Communication	Cell Tower	34.71977130	76.66271731	CARTERET COUNTY COURTHOUSE	Private	12.40	9.40	6.40
14	Tourism / Economy	Downtown Commercial	34.71683460	76.66490374	BEAUFORT INVESTMENTS LLP	Private	8.68	5.68	2.68
15	Tourism / Economy	Downtown Commercial	34.71664189	76.66477580	TAYLOR'S CREEK ENTERPRISES LLC	Private	7.47	4.47	1.47
16	Communication	Cell Tower	34.72004689	76.66212587	CARTERET COUNTY COURTHOUSE	Private	12.49	9.49	6.49
17	Water	Water Tower	34.71691952	76.65371025	TOWN OF BEAUFORT	Public	11.78	8.78	5.78
18	Water	Water Tower	34.72947339	76.63458834	TOWN OF BEAUFORT	Public	10.27	7.27	4.27
19	Water	Water Tower	34.72953962	76.63497136	TOWN OF BEAUFORT	Public	10.57	7.57	4.57
20	Communication	Cell Tower	34.71944734	76.66197012	CARTERET COUNTY COURTHOUSE	Private	12.78	9.78	6.78

Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
$20,781,084	No	Yes	Yes	1	1	2	2	6
$166,743	No	Yes	Yes	1	2	2	3	8
$144,111	No	Yes	Yes	1	1	2	2	6
$47,925	No	Yes	Yes	1	1	2	2	6
$166,743	No	Yes	Yes	1	1	2	2	6
$273,397	No	Yes	Yes	1	1	2	2	6
$273,397	No	Yes	Yes	1	1	2	2	6
$5,722,945	No	Yes	Yes	1	1	1	2	5
$2,155,211	No	No	No	1	1	2	1	5
$1,757,820	No	Yes	Yes	1	1	2	2	6
$1,757,820	No	Yes	Yes	1	1	2	2	6
$113,689	No	Yes	Yes	1	1	2	2	6
$20,781,084	No	No	Yes	1	1	2	2	6
$935,464	Yes	Yes	Yes	1	1	2	2	6
$215,243	Yes	Yes	Yes	1	2	2	3	8
$20,781,084	No	Yes	Yes	1	1	2	2	6
$300,000	No	No	Yes	1	1	2	2	6
$300,000	No	Yes	Yes	1	1	2	2	6
$47,209,802	No	Yes	Yes	1	1	2	2	6
$20,781,084	No	No	Yes	1	1	1	2	5

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
21	Tourism / Economy	Downtown Commercial	34.71670455	76.66487457	BEAUFORT INVESTMENTS LLP	Private	7.22	4.22	1.22
22	Tourism / Economy	Downtown Commercial	34.71692436	76.66496350	t,MARGARET PINER	Private	8.96	5.96	2.96
23	Tourism / Economy	Downtown Commercial	34.71691164	76.66525913	GENE LEWIS PROPERTIES LLC	Private	9.27	6.27	3.27
24	Tourism / Economy	Downtown Commercial	34.71706978	76.66558929	FIRST CITIZENS BANK	Private	8.32	5.32	2.32
25	Tourism / Economy	Downtown Commercial	34.71682973	76.66517392	BRYAN ETAL LYNELL VERCH REV TR	Private	8.79	5.79	2.79
26	Tourism / Economy	Downtown Commercial	34.71696619	76.66535836	GENE LEWIS PROPERTIES LLC	Private	9.17	6.17	3.17
27	Tourism / Economy	Downtown Commercial	34.71659479	76.66468365	STRICKLAND, DORIS O ETAL	Private	7.62	4.62	1.62
28	Tourism / Economy	Maritime Museum	34.71790770	76.66581993	STATE OF NORTH CAROLINA	Private	7.64	4.64	1.64
29	Distribution Center	Baptist Church	34.71835431	76.66426788	FIRST BAPTIST CHURCH BEAUFORT	Private	12.17	9.17	6.17
30	Distribution Center	Methodist Church	34.71801174	76.66357112	ANN STREET METHODIST CHURCH	Private	11.64	8.64	5.64
31	Government Services	Town Hall	34.71519999	76.66202884	TOWN OF BEAUFORT	Public	8.33	5.33	2.33
32	Grocery	Market	34.72113697	76.66288441	FATOMA INC	Private	8.13	5.13	2.13
33	Tourism / Economy	Downtown Commercial	34.71780763	76.66562542	OLD CAUSEWAY THOROUGHFARE LLC	Private	8.36	5.36	2.36
34	Tourism / Economy	Downtown Commercial	34.71761116	76.66576875	t,RICHARD H JR ETUX BRE	Private	10.16	7.16	4.16
35	Tourism / Economy	Downtown Commercial	34.71798299	76.66560125	AB CAUSEWAY LLC	Private	8.51	5.51	2.51
36	Tourism / Economy	Downtown Commercial	34.71756370	76.66527798	BEAUFORT HISTORICAL ASSOCIATIO	Private	7.31	4.31	1.31
37	Government Services	Public Works Maintenance Building	34.71752326	76.65437238	TOWN OF BEAUFORT	Public	13.20	10.20	7.20
38	Distribution Center	Episcopal Church	34.71996025	76.66679427	ST PAULS EPISCOPAL CHURCH	Private	11.43	8.43	5.43
39	School	School	34.73057495	76.64475687	COUNTY OF CARTERET	Public	13.70	10.70	7.70
40	Grocery	Food Lion	34.73563093	76.63707168	ROSEMYR CORPORATION	Private	16.10	13.10	10.10

Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
$935,464	Yes	Yes	Yes	1	2	2	3	8
$271,691	Yes	Yes	Yes	1	1	2	2	6
$166,743	Yes	Yes	Yes	1	1	2	2	6
$887,675	Yes	Yes	Yes	1	1	2	2	6
$300,341	Yes	Yes	Yes	1	1	2	2	6
$166,743	Yes	Yes	Yes	1	1	2	2	6
$213,793	Yes	Yes	Yes	1	2	2	3	8
$1,507,727	No	Yes	Yes	1	2	2	3	8
$299,806	No	Yes	Yes	1	1	2	2	6
$1,347,792	No	Yes	Yes	1	1	2	2	6
$693,015	Yes	Yes	Yes	1	1	2	2	6
$123,694	No	Yes	Yes	1	1	2	2	6
$94,977	No	Yes	Yes	1	1	2	2	6
$248,000	Yes	Yes	Yes	1	1	2	2	6
$132,771	No	Yes	Yes	1	1	2	2	6
$25,696	Yes	Yes	Yes	1	2	2	3	8
$59,037	No	No	Yes	1	1	1	2	5
$1,757,820	No	Yes	Yes	1	1	2	2	6
$2,155,211	No	No	No	1	1	2	1	5
$1,785,081	No	No	No	1	1	1	1	4

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
41	Government Services	Public Works Maintenance Building	34.71739720	76.65446260	TOWN OF BEAUFORT	Public	13.43	10.43	7.43
42	Government Services	Public Works Maintenance Building	34.71740690	76.65492017	TOWN OF BEAUFORT	Public	14.46	11.46	8.46
43	Tourism / Economy	Downtown Commercial	34.71743295	76.66539743	ALDERON CORPORATION	Private	5.35	2.35	(0.65)
44	Tourism / Economy	Downtown Commercial	34.71646047	76.66345221	SMITH,ANNE HILL ETAL GORDON	Private	12.80	9.80	6.80
45	Tourism / Economy	Downtown Commercial	34.71690256	76.66411892	SANTORO,DINA CHARLENE TRUSTEE	Private	9.57	6.57	3.57
46	Tourism / Economy	Downtown Commercial	34.71750723	76.66586723	CHADWICK, RICHARD H JR ETUX BRE	Private	6.65	3.65	0.65
47	Building Supplies	Ace Hardware	34.72525674	76.64716979	SIM MUN LLC	Private	7.53	4.53	1.53
48	Building Supplies	Ace Hardware	34.72636718	76.64690872	SIM MUN LLC	Private	9.35	6.35	3.35
49	Emergency Services	EMS / Ambulance	34.72642670	76.65063334	BEAUFORT RESCUE SQUAD	Private	12.24	9.24	6.24
50	Water	Drinking Water Well and Treatment	34.71804778	76.65563671	BEAUFORT RECYCLING CENTER	Private	15.09	12.09	9.09
51	Water	Drinking Water Well and Treatment	34.71798165	76.65518981	BEAUFORT RECYCLING CENTER	Private	15.12	12.12	9.12
52	Tourism / Economy	Downtown Commercial	34.71617320	76.66476981	LOW VALLEY LLC	Private	3.98	0.98	(2.02)
53	Water	Drinking Water Well and Treatment	34.71804278	76.65592069	BEAUFORT RECYCLING CENTER	Private	17.26	14.26	11.26
54	Distribution Center	Episcopal Church	34.71963645	76.66645102	ST PAULS EPISCOPAL CHURCH	Private	11.32	8.32	5.32
55	Tourism / Economy	Downtown Commercial	34.71702774	76.66541473	FIRST CITIZENS BANK	Private	9.28	6.28	3.28
56	Tourism / Economy	Downtown Commercial	34.71672938	76.66577009	400 FRONT STREET PROPERTIS LLC	Private	7.78	4.78	1.78
57	Tourism / Economy	Downtown Commercial	34.71624568	76.66405136	OWENS,NELSON N ETUX PATRICIA A	Private	7.05	4.05	1.05
58	Tourism / Economy	Downtown Commercial	34.71605552	76.66366799	COYNER,BARBARA BLACKWELL TRU	Private	7.62	4.62	1.62
59	Tourism / Economy	Downtown Commercial	34.71617667	76.66394370	SMITH,ANNE HILL ETAL GORDON	Private	7.45	4.45	1.45
60	Tourism / Economy	Downtown Commercial	34.71653463	76.66435088	BRICKELL,SCOTT ETUX DONNA	Private	10.35	7.35	4.35

Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
$59,037	No	No	Yes	1	1	1	2	5
$59,037	No	No	No	1	1	1	1	4
$510,577	Yes	Yes	Yes	1	3	2	3	9
$136,682	Yes	Yes	Yes	1	1	2	2	6
$145,754	Yes	Yes	Yes	1	1	2	2	6
$248,000	Yes	Yes	Yes	1	2	2	3	8
$2,016,014	Yes	Yes	Yes	1	2	2	3	8
$2,016,014	Yes	Yes	Yes	1	1	2	2	6
$273,397	No	Yes	Yes	1	1	2	2	6
$203,146	No	No	No	1	1	1	1	4
$203,146	No	No	No	1	1	1	1	4
$457,421	Yes	Yes	Yes	2	3	3	3	11
$203,146	No	No	No	1	1	1	1	4
$1,757,820	No	Yes	Yes	1	1	2	2	6
$887,675	Yes	Yes	Yes	1	1	2	2	6
$650,791	Yes	Yes	Yes	1	2	3	3	9
$123,048	Yes	Yes	Yes	1	2	2	3	8
$182,836	Yes	Yes	Yes	1	2	2	3	8
$136,682	Yes	Yes	Yes	1	2	2	3	8
$206,212	Yes	Yes	Yes	1	1	2	2	6

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
61	Tourism / Economy	Downtown Commercial	34.71636580	76.66409106	OWENS,NELSON N ETUX PATRICIA A	Private	8.57	5.57	2.57
62	Energy (fuel)	Gas Station	34.73169529	76.63755821	TRADE LAND COMPANY LLC	Private	11.88	8.88	5.88
63	Food	Dollar General	34.73206144	76.63706882	DOLGENCORP INC	Private	12.02	9.02	6.02
64	Tourism / Economy	Downtown Commercial	34.71610789	76.66376200	PLAZA MEXICO BAR & GRILL INC	Private	7.57	4.57	1.57
65	Tourism / Economy	Downtown Commercial	34.71743871	76.66721936	WARRINGTON, JOHN ETUX SONDA	Private	6.72	3.72	0.72
66	Tourism / Economy	Downtown Commercial	34.71682682	76.66595233	400 FRONT STREET PROPERTIS LLC	Private	10.44	7.44	4.44
67	Tourism / Economy	Downtown Commercial	34.71667239	76.66567120	WHEATLY PROPERTIES LLC	Private	7.37	4.37	1.37
68	Tourism / Economy	The Boathouse	34.71724646	76.66681419	STATE OF NORTH CAROLINA	Private	5.38	2.38	(0.62)
69	Tourism / Economy	Maritime Museum	34.71781917	76.66626272	STATE OF NORTH CAROLINA	Private	11.11	8.11	5.11
70	Tourism / Economy	Downtown Commercial	34.71615977	76.66385339	PLAZA MEXICO BAR & GRILL INC	Private	7.85	4.85	1.85
71	Tourism / Economy	Downtown Commercial	34.71620788	76.66398981	SMITH,ANNE HILL ETAL GORDON	Private	7.19	4.19	1.19
72	Employment / Research	Duke Research Facility	34.71661657	76.67313419	DUKE UNIVERSITY	Private	9.82	6.82	3.82
73	Building Supplies	Ace Hardware	34.72687884	76.64625100	SIM MUN LLC	Private	9.71	6.71	3.71
74	Grocery	Piggly Wiggly	34.72445321	76.64548108	ANNIE L JONES COMPANY INC	Private	11.11	8.11	5.11
75	Building Supplies	Ace Hardware	34.72680458	76.64689654	SIM MUN LLC	Private	9.15	6.15	3.15
76	Emergency Services	Fire Department	34.71900715	76.65539646	TOWN OF BEAUFORT	Public	15.41	12.41	9.41
77	Tourism / Economy	Downtown Commercial	34.71767287	76.66753454	JBJ PROPERTIES LLC	Private	7.58	4.58	1.58
78	Tourism / Economy	Downtown Commercial	34.71777252	76.66777055	JBJ PROPERTIES LLC	Private	5.55	2.55	(0.45)
79	Tourism / Economy	Downtown Commercial	34.71704228	76.66639644	THE GEER FAMILY LLC	Private	4.57	1.57	(1.43)
80	Building Supplies	Ace Hardware	34.72542339	76.64678903	SIM MUN LLC	Private	9.35	6.35	3.35
81	Sewer	Wastewater Treatment Plant	34.71728432	76.63836496	TOWN OF BEAUFORT	Public	13.57	10.57	7.57
82	Sewer	Wastewater Treatment Plant	34.71730939	76.63896020	TOWN OF BEAUFORT	Public	12.49	9.49	6.49
83	Sewer	Wastewater Treatment Plant	34.71882079	76.63822751	TOWN OF BEAUFORT	Public	10.76	7.76	4.76

Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
$123,048	Yes	Yes	Yes	1	1	2	2	6
$485,738	No	No	Yes	1	1	2	2	6
$464,299	No	Yes	Yes	1	1	2	2	6
$252,020	Yes	Yes	Yes	1	2	2	3	8
$162,914	Yes	Yes	Yes	1	2	2	3	8
$650,791	Yes	Yes	Yes	1	1	3	2	7
$261,414	Yes	Yes	Yes	1	2	3	3	9
$201,440	Yes	Yes	Yes	1	3	2	3	9
$1,507,727	Yes	Yes	Yes	1	1	2	2	6
$252,020	Yes	Yes	Yes	1	2	2	3	8
$136,682	Yes	Yes	Yes	1	2	2	3	8
$1,965,543	Yes	Yes	Yes	1	1	2	2	6
$2,016,014	No	Yes	Yes	1	1	2	2	6
$53,100	No	Yes	Yes	1	1	2	2	6
$2,016,014	No	Yes	Yes	1	1	2	2	6
$2,378,976	No	No	No	1	1	1	1	4
$997,597	Yes	Yes	Yes	1	2	2	3	8
$997,597	Yes	Yes	Yes	1	3	2	3	9
$218,212	Yes	Yes	Yes	2	3	2	3	10
$2,016,014	Yes	Yes	Yes	1	1	2	2	6
$653,526	No	No	No	1	1	1	1	4
$653,526	No	No	Yes	1	1	2	2	6
$653,526	No	Yes	Yes	1	1	2	2	6

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
84	Employment / Research	Duke Research Facility	34.71651085	76.67260537	DUKE UNIVERSITY	Private	12.31	9.31	6.31
85	Employment / Research	Duke Research Facility	34.71753884	76.67163606	DUKE UNIVERSITY	Private	11.46	8.46	5.46
86	Employment / Research	USACE Facility	34.71918483	76.67148589	UNITED STATES OF AMERICA	Public	5.09	2.09	(0.91)
87	Employment / Research	USACE Facility	34.71903689	76.67132331	UNITED STATES OF AMERICA	Public	4.39	1.39	(1.61)
88	Employment / Research	Duke Research Facility	34.71663062	76.67215061	DUKE UNIVERSITY	Private	12.37	9.37	6.37
89	Employment / Research	Duke Research Facility	34.71721189	76.67234173	DUKE UNIVERSITY	Private	9.86	6.86	3.86
90	Employment / Research	Duke Research Facility	34.71776733	76.67183354	DUKE UNIVERSITY	Private	10.70	7.70	4.70
91	Employment / Research	Duke Research Facility	34.71698041	76.67232957	DUKE UNIVERSITY	Private	9.04	6.04	3.04
92	Employment / Research	Duke Research Facility	34.71750149	76.67192181	DUKE UNIVERSITY	Private	11.39	8.39	5.39
93	Employment / Research	USACE Facility	34.71966919	76.67247324	UNITED STATES OF AMERICA	Public	8.75	5.75	2.75
94	Employment / Research	Duke Research Facility	34.71700675	76.67194420	DUKE UNIVERSITY	Private	11.31	8.31	5.31
95	Employment / Research	Duke Research Facility	34.71688262	76.67239076	DUKE UNIVERSITY	Private	9.91	6.91	3.91
96	Employment / Research	Duke Research Facility	34.71730695	76.67108501	DUKE UNIVERSITY	Private	9.78	6.78	3.78
97	Employment / Research	Duke Research Facility	34.71672512	76.67114668	DUKE UNIVERSITY	Private	10.27	7.27	4.27
98	Employment / Research	USACE Facility	34.71934017	76.67140831	UNITED STATES OF AMERICA	Public	8.10	5.10	2.10
99	Employment / Research	Duke Research Facility	34.71677512	76.67136894	DUKE UNIVERSITY	Private	11.32	8.32	5.32
100	Employment / Research	USACE Facility	34.71958776	76.67196914	UNITED STATES OF AMERICA	Public	7.94	4.94	1.94
101	Employment / Research	Duke Research Facility	34.71675201	76.67168506	DUKE UNIVERSITY	Private	13.79	10.79	7.79
102	Employment / Research	USACE Facility	34.71870978	76.67236779	UNITED STATES OF AMERICA	Public	8.25	5.25	2.25
103	Employment / Research	Duke Research Facility	34.71706125	76.67121409	DUKE UNIVERSITY	Private	10.66	7.66	4.66
104	Employment / Research	Duke Research Facility	34.71703081	76.67169536	DUKE UNIVERSITY	Private	11.39	8.39	5.39
105	Employment / Research	USACE Facility	34.71779487	76.67262190	UNITED STATES OF AMERICA	Public	6.91	3.91	0.91
106	Employment / Research	Duke Research Facility	34.71592457	76.67203335	DUKE UNIVERSITY	Private	11.87	8.87	5.87

Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,082,123	Yes	Yes	Yes	1	3	3	3	10
$1,082,123	Yes	Yes	Yes	2	3	3	3	11
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,965,543	Yes	Yes	Yes	1	1	2	2	6
$1,965,543	Yes	Yes	Yes	1	1	2	2	6
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,082,123	Yes	Yes	Yes	1	1	3	2	7
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,965,543	Yes	Yes	Yes	1	1	3	2	7
$1,965,543	Yes	Yes	Yes	1	1	2	2	6
$1,082,123	Yes	Yes	Yes	1	1	3	2	7
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,082,123	Yes	Yes	Yes	1	2	3	3	9
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,082,123	Yes	Yes	Yes	1	1	2	2	6
$1,965,543	Yes	Yes	Yes	1	1	2	2	6
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,082,123	Yes	Yes	Yes	1	2	2	3	8
$1,965,543	No	Yes	Yes	1	1	2	2	6

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
107	Employment / Research	Duke Research Facility	34.71751828	76.67132733	DUKE UNIVERSITY	Private	10.47	7.47	4.47
108	Employment / Research	Duke Research Facility	34.71704692	76.67145142	DUKE UNIVERSITY	Private	10.89	7.89	4.89
109	Employment / Research	Duke Research Facility	34.71690729	76.67270274	DUKE UNIVERSITY	Private	9.65	6.65	3.65
110	Employment / Research	USACE Facility	34.71895186	76.67199887	UNITED STATES OF AMERICA	Public	8.93	5.93	2.93
111	Employment / Research	Duke Research Facility	34.71772184	76.67118025	DUKE UNIVERSITY	Private	9.26	6.26	3.26
112	Employment / Research	Duke Research Facility	34.71632271	76.67169516	DUKE UNIVERSITY	Private	12.45	9.45	6.45
113	Tourism / Economy	Downtown Commercial	34.71580305	76.66406285	BEAUFORT HOUSE LLC	Private	6.63	3.63	0.63
114	Tourism / Economy	Downtown Commercial	34.71584935	76.66402464	BEAUFORT HOUSE LLC	Private	6.63	3.63	0.63
115	Tourism / Economy	Downtown Commercial	34.71652268	76.66419394	BRICKELL,SCOTT ETUX DONNA	Private	10.21	7.21	4.21
116	Tourism / Economy	Downtown Commercial	34.71640837	76.66431184	BRICKELL,SCOTT ETUX DONNA	Private	10.21	7.21	4.21
117	Tourism / Economy	Downtown Commercial	34.71633424	76.66437193	BRICKELL,SCOTT ETUX DONNA	Private	10.21	7.21	4.21
118	Tourism / Economy	Downtown Commercial	34.71636696	76.66423625	OWENS,ELBERT WEST JR	Private	10.21	7.21	4.21
119	Tourism / Economy	Downtown Commercial	34.71643529	76.66418092	HINES,LAURA MATTHEWS BREGLER	Private	10.21	7.21	4.21
120	Tourism / Economy	Downtown Commercial	34.71574002	76.66408333	ADAMS,JEFFREY SMITH	Private	6.63	3.63	0.63
121	Tourism / Economy	Downtown Commercial	34.71651022	76.66412504	HINES,LAURA MATTHEWS BREGLER	Private	10.21	7.21	4.21
122	Tourism / Economy	Downtown Commercial	34.71575206	76.66383822	BEAUFORT HOUSE LLC	Private	6.63	3.63	0.63
123	Tourism / Economy	Downtown Commercial	34.71647637	76.66425674	BRICKELL,SCOTT ETUX DONNA	Private	10.21	7.21	4.21
124	Tourism / Economy	Downtown Commercial	34.71725971	76.66598448	DUNCAN OF BEAUFORT LLC	Private	4.13	1.13	(1.87)
125	Tourism / Economy	Downtown Commercial	34.71737421	76.66597518	NELSON SQUARE LLC	Private	4.13	1.13	(1.87)
126	Tourism / Economy	Downtown Commercial	34.71570375	76.66387948	BEAUFORT HOUSE LLC	Private	6.63	3.63	0.63
127	Tourism / Economy	Downtown Commercial	34.71575322	76.66397093	BEAUFORT HOUSE LLC	Private	6.63	3.63	0.63
128	Tourism / Economy	Downtown Commercial	34.71629267	76.66429647	JARRETT BAY GROUP LLC	Private	10.21	7.21	4.21
129	Tourism / Economy	Downtown Commercial	34.71730597	76.66606935	BEAUFORT REAL ESTATE LLC	Private	4.13	1.13	(1.87)

Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
$1,965,543	Yes	Yes	Yes	1	1	2	2	6
$1,965,543	No	Yes	Yes	1	1	2	2	6
$1,965,543	Yes	Yes	Yes	1	1	2	2	6
$1,082,123	Yes	Yes	Yes	1	1	2	2	6
$1,965,543	Yes	Yes	Yes	1	1	3	2	7
$1,965,543	Yes	Yes	Yes	1	1	2	2	6
$449,280	Yes	Yes	Yes	1	2	3	3	9
$449,280	Yes	Yes	Yes	1	2	3	3	9
$206,212	Yes	Yes	Yes	1	1	2	2	6
$206,212	Yes	Yes	Yes	1	1	2	2	6
$206,212	Yes	Yes	Yes	1	1	2	2	6
$278,610	Yes	Yes	Yes	1	1	2	2	6
$149,850	Yes	Yes	Yes	1	1	2	2	6
$445,500	Yes	Yes	Yes	1	2	3	3	9
$149,850	Yes	Yes	Yes	1	1	2	2	6
$426,120	Yes	Yes	Yes	1	2	1	3	7
$206,212	Yes	Yes	Yes	1	1	2	2	6
$131,803	Yes	Yes	Yes	2	3	2	3	10
$297,810	Yes	Yes	Yes	2	3	2	3	10
$426,120	Yes	Yes	Yes	1	2	1	3	7
$449,280	Yes	Yes	Yes	1	2	1	3	7
$326,340	Yes	Yes	Yes	1	1	2	2	6
$135,885	Yes	Yes	Yes	2	3	2	3	10

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
130	Tourism / Economy	Downtown Commercial	34.71579992	76.66393151	BEAUFORT HOUSE LLC	Private	6.63	3.63	0.63
131	Tourism / Economy	Downtown Commercial	34.71566773	76.66394332	LIPSCOMB, KENNETH A ETUX GEORGE	Private	6.63	3.63	0.63
132	Tourism / Economy	Downtown Commercial	34.71749952	76.66532613	BEAUFORT HISTORICAL ASSOCIATIO	Private	7.31	4.31	1.31
133	Tourism / Economy	Downtown Commercial	34.71790975	76.66562198	AB CAUSEWAY LLC	Private	8.51	5.51	2.51
134	Tourism / Economy	Downtown Commercial	34.71756345	76.66582331	CHADWICK, RICHARD H JR ETUX BRE	Private	6.65	3.65	0.65
135	Tourism / Economy	Downtown Commercial	34.71743392	76.66592217	NELSON SQUARE LLC	Private	6.65	3.65	0.65
136	Communication	Cell Tower	34.71913128	76.65433608	AMERICAN TOWERS LLC	Private	11.39	8.39	5.39
137	Tourism / Economy	Downtown Commercial	34.71728821	76.66552181	NEUSE INC	Private	5.14	2.14	(0.86)
138	Tourism / Economy	Downtown Commercial	34.71718410	76.66663003	TAYLORS CREEK GROUP LLC	Private	2.39	(0.61)	(3.61)
139	Tourism / Economy	Downtown Commercial	34.71713998	76.66654926	TAYLORS CREEK GROUP LLC	Private	2.49	(0.51)	(3.51)
140	Tourism / Economy	Downtown Commercial	34.71686176	76.66385203		Private	7.12	4.12	1.12
141	Tourism / Economy	Downtown Commercial	34.71681804	76.66457108	TOWN OF BEAUFORT	Public	5.45	2.45	(0.55)
142	Emergency Services	Lynn Eury Park + Police/Fire Dock	34.71488468	76.66234503	TOWN OF BEAUFORT	Public	3.39	0.39	(2.61)
143	Sewer	Sewer Pump Station	34.73465576	76.63594365	Town of Beaufort	Public	10.75	7.75	4.75
144	Sewer	Sewer Pump Station	34.72904072	76.63779838	Town of Beaufort	Public	8.01	5.01	2.01
145	Sewer	Sewer Pump Station	34.73324408	76.65191815	Town of Beaufort	Public	8.48	5.48	2.48
146	Sewer	Sewer Pump Station	34.72617459	76.66099240	Town of Beaufort	Public	5.64	2.64	(0.36)
147	Sewer	Sewer Pump Station	34.72536211	76.64531379	Town of Beaufort	Public	7.28	4.28	1.28
148	Sewer	Sewer Pump Station	34.72041365	76.65039999	Town of Beaufort	Public	6.37	3.37	0.37
149	Sewer	Sewer Pump Station	34.72275711	76.65796637	Town of Beaufort	Public	5.01	2.01	(1.00)
150	Sewer	Sewer Pump Station	34.72210035	76.66499452	Town of Beaufort	Public	5.17	2.17	(0.83)
151	Sewer	Sewer Pump Station	34.71694644	76.66613161	Town of Beaufort	Public	3.98	0.98	(2.02)

Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
$449,280	Yes	Yes	Yes	1	2	1	3	7
$460,600	Yes	Yes	Yes	1	2	1	3	7
$25,696	Yes	Yes	Yes	1	2	2	3	8
$132,771	No	Yes	Yes	1	1	2	2	6
$248,000	Yes	Yes	Yes	1	2	2	3	8
$297,810	Yes	Yes	Yes	1	2	2	3	8
$-	No	No	Yes	1	1	2	2	6
$3,329	Yes	Yes	Yes	1	3	2	3	9
$2,450	Yes	Yes	Yes	3	3	2	3	11
$3,892,888	Yes	Yes	Yes	3	3	2	3	11
$-	No	Yes	Yes	1	2	2	3	8
$1,519	Yes	Yes	Yes	1	3	2	3	9
$-	Yes	Yes	Yes	2	3	3	3	11
$500,000	No	No	No	1	1	1	1	4
$500,000	No	Yes	Yes	1	1	2	2	6
$500,000	No	Yes	Yes	1	1	2	2	6
$500,000	Yes	Yes	Yes	1	3	3	3	10
$500,000	No	Yes	Yes	1	2	2	3	8
$500,000	Yes	Yes	Yes	1	2	2	3	8
$500,000	Yes	Yes	Yes	1	3	3	3	10
$500,000	Yes	Yes	Yes	1	3	3	3	10
$500,000	Yes	Yes	Yes	2	3	3	3	11

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
152	Sewer	Sewer Pump Station	34.71071897	76.63630296	Town of Beaufort	Public	5.57	2.57	(0.43)
153	Sewer	Sewer Pump Station	34.71140713	76.64277968	Town of Beaufort	Public	4.41	1.41	(1.59)
154	Sewer	Sewer Pump Station	34.71261032	76.65491468	Town of Beaufort	Public	4.07	1.07	(1.93)
155	Sewer	Sewer Pump Station	34.71432934	76.66129062	Town of Beaufort	Public	4.03	1.03	(1.97)
156	Energy (fuel)	Fuel Depot	34.73205166	76.65807059		Private	6.58	3.58	0.58
157	Tiller Elem. School	School	34.73505824	76.63450027		Private	11.65	8.65	5.65
158	Tiller Elem. School	School	34.73525104	76.63460499		Private	11.59	8.59	5.59
159	Airport	Michael Smith Airport	34.73323632	76.65449140		Private	10.48	7.48	4.48
160	Airport	Michael Smith Airport	34.72949609	76.65469296		Private	10.12	7.12	4.12
161	Airport	Michael Smith Airport	34.72947744	76.65394070		Private	9.28	6.28	3.28
162	Airport	Michael Smith Airport	34.73051563	76.65471567		Private	10.31	7.31	4.31
163	Airport	Michael Smith Airport	34.73036021	76.65474197		Private	10.41	7.41	4.41
164	Airport	Michael Smith Airport	34.73020602	76.65474215		Private	10.14	7.14	4.14
165	Airport	Michael Smith Airport	34.72951133	76.65452685		Private	10.06	7.06	4.06
166	Airport	Michael Smith Airport	34.72951462	76.65419907		Private	9.62	6.62	3.62
167	Airport	Michael Smith Airport	34.73199149	76.65432998		Private	9.88	6.88	3.88
168	Airport	Michael Smith Airport	34.73385671	76.65449231		Private	9.78	6.78	3.78
169	Airport	Michael Smith Airport	34.73139884	76.65398594		Private	9.65	6.65	3.65
170	Airport	Michael Smith Airport	34.73105498	76.65467033		Private	10.59	7.59	4.59
171	Airport	Michael Smith Airport	34.73168970	76.65456120		Private	9.72	6.72	3.72
172	Airport	Michael Smith Airport	34.73139403	76.65455485		Private	9.89	6.89	3.89
173	Airport	Michael Smith Airport	34.73169782	76.65398794		Private	9.67	6.67	3.67
174	Airport	Michael Smith Airport	34.73274856	76.65438840		Private	10.40	7.40	4.40

Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
$500,000	Yes	Yes	Yes	1	3	2	3	9
$500,000	Yes	Yes	Yes	2	3	2	3	10
$500,000	Yes	Yes	Yes	2	3	2	3	10
$500,000	Yes	Yes	Yes	2	3	3	3	11
$-	No	Yes	Yes	1	2	2	3	8
$36,693	No	No	Yes	1	1	2	2	6
$106,501	No	No	Yes	1	1	2	2	6
$185,909	No	Yes	Yes	1	1	2	2	6
$20,039	No	Yes	Yes	1	1	2	2	6
$38,985	No	Yes	Yes	1	1	2	2	6
$20,640	No	Yes	Yes	1	1	2	2	6
$15,949	No	Yes	Yes	1	1	2	2	6
$13,446	No	Yes	Yes	1	1	2	2	6
$15,652	No	Yes	Yes	1	1	2	2	6
$30,054	No	Yes	Yes	1	1	2	2	6
$128,953	No	Yes	Yes	1	1	2	2	6
$26,364	Yes	Yes	Yes	1	1	2	2	6
$52,105	No	Yes	Yes	1	1	2	2	6
$66,868	No	Yes	Yes	1	1	2	2	6
$61,385	No	Yes	Yes	1	1	2	2	6
$59,440	No	Yes	Yes	1	1	2	2	6
$50,332	No	Yes	Yes	1	1	2	2	6
$21,402	No	Yes	Yes	1	1	2	2	6

Asset ID	Asset Type	Asset Name	Latitude	Longitude	Owner	Ownership	FFE	FreeBd3ft	FreeBd6ft
175	Airport	Michael Smith Airport	34.73022517	76.65412421		Private	10.21	7.21	4.21
176	Airport	Michael Smith Airport	34.72988247	76.65412166		Private	9.77	6.77	3.77
177	Airport	Michael Smith Airport	34.72987565	76.65470119		Private	10.17	7.17	4.17
178	Tiller Elem. School	School	34.73458594	76.63417658		Private	11.17	8.17	5.17
179	Tiller Elem. School	School	34.73477283	76.63382937		Private	10.74	7.74	4.74
180	Tiller Elem. School	School	34.73508853	76.63417547		Private	11.19	8.19	5.19

	Estimated Value	Fld100yr	Fld500yr	Fld_3FtSFH	Vulnerability to 3' sea level rise (Vul_SLR3), 1 (low) to 3 (high)	Vulnerability to tidal flooding after 3' of sea level rise (Vul_tide), 1 (low) to 3 (high)	Vulnerability to flooding from storm surge (Vul_surge), 1 (low) to 3 (high)	Vulnerability to storm flooding after 3' of sea level rise (Vul_3FtSFH), 1 (low) to 3 (high)	Composite Vulnerability to all measured hazards (Vul_Comp), higher value is more vulnerable / sensitive
	$128,304	No	Yes	Yes	1	1	2	2	6
	$128,828	No	Yes	Yes	1	1	2	2	6
	$34,629	No	Yes	Yes	1	1	2	2	6
	$188,392	No	Yes	Yes	1	1	2	2	6
	$169,472	No	Yes	Yes	1	1	2	2	6
	$139,264	No	Yes	Yes	1	1	2	2	6

TOWN of
BEAUFORT
NORTH CAROLINA

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STEWART