Phase 1 & 2

Newland Township Resilience Strategy

June 28, 2024

PASQUOTANK COUNTY

North Carolina RESILIENT COASTAL COMMUNITIES PROGRAM

Weston & Sampson SM

Acknowledgements

This project is funded by the National Fish and Wildlife Foundation and administered by North Carolina Department of Environmental Quality Division of Coastal Management (DCM) through the North Carolina Resilient Coastal Communities Program (RCCP).

This project would not be possible without the contributions of many dedicated individuals committed to a more resilient future for Newland Township, Pasquotank County. The time, input, and expertise of the following people were integral to the development of an implementable Resilient Strategy.

Community Action Team (CAT)
Kevin Brickhouse, Planning Board Member
Joseph Gregory, Planning Board Member
Glenn Harris, Soil and Water Conservation Supervisor
Charles Jordan, Chairman of the Board of Commissioners
Bill Kruse, Chairman, Pasquotank County Planning Board
Brian Parnell, Pasquotank-Camden Emergency Management
John Spence,
Brian Stallings, Stallings & Stallings Farms

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1 Introduction

1.1 Overview

The North Carolina Resilient Coastal Communities Program (RCCP) is a state-local partnership designed to help overcome barriers in coastal resilience and adaptation planning, boost local government capacity, and support a proactive, sustainable, and equitable approach to coastal resilience planning and project implementation. The RCCP is managed by the Division of Coastal Management and receives funding from the North Carolina General Assembly and National Fish and Wildlife Foundation Coastal Resilience Fund. All counties and municipalities within the CAMA jurisdiction, those subject to the Coastal Area Management Act, are eligible to apply for the RCCP.

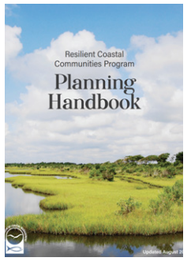
There are four phases of the NC RCCP:

- Phase 1: Community Engagement & Risk/Vulnerability Assessment
- Phase 2: Planning, Project Identification, & Prioritization
- Phase 3: Engineering & Design
- Phase 4: Project Implementation

Phases 1 and 2

This report includes the components required for Phases 1 and 2 of this program for Newland Township, Pasquotank County. The objective of these two phases is to perform a risk and vulnerability assessment and develop a portfolio of solutions to address these climate and flood vulnerability. Once communities complete Phases 1 and 2 for RCCP they are eligible to apply for additional funding via Phase 3 and Phase 4.

About the RCCP Planning Handbook



The RCCP is a step-wise process with a prescriptive handbook. The purpose of the handbook is to guide contractors and local governments in completing Phases 1 and 2 of the RCCP. Within the handbook are existing data, tools, and resources.

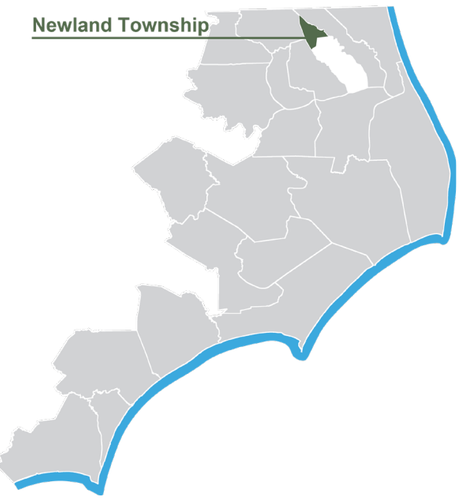
Pasquotank County is committed to making the County more resilient to storm and flood events to better protect critical and natural infrastructure, facilities, and public amenities. In addition, the County would like to help residents and property owners better prepare for such events. Therefore, the County pursued funding to participate in the RCCP to plan for a safer future in which development is adapted to climate impacts and supports better stormwater management, a future where parks also help mitigate flooding and where residents are connected to one another and to resources that enhance their overall resilience.

The County chose to focus on Newland Township specifically for the Resilience Strategy. The Newland Township community consists of 62.3 square miles and is bordered to the north by the Great Dismal Swamp and to the east by the Upper Pasquotank River. The Newland Drainage Canal runs through the middle of the township. Newland Township has traditionally been characterized by low density residential development and vast amounts of farmland, but due to the community's location in the northern part of the county near Highway 17/Future I-87 corridor this area has begun to slowly transform into a bedroom community for Virginia Beach.[1] Frequent flooding due to the area's proximity to the Swamp and the river in conjunction with new development pressures makes Newland Township a prime area in which to focus on resiliency. The area experiences flooding due to storm surge, heavy precipitation events, sea level rise, tidal fluxes, and riverine surges, placing both homes and farmlands at significant risk. Saltwater intrusion of agricultural fields and failure of septic tanks are of concern in Newland Township. Residents expressed that roadway drainage and drainage ditch overflow are two major problems that contribute to flooding in the area.

1.2 Community Description

Pasquotank County is located in the Albemarle region. A distinctive part of this region is the Albemarle Sound, a large estuary at the confluence of the Chowan, Alligator, Pasquotank, and Perquimans rivers. Pasquotank County contains six townships including Elizabeth City and Newland Township, the focus of this Resilience Strategy.

Newland Township is located within the top western corner of the county. The Township also contains the Route 123 corridor, which has a cluster of critical assets at Morgan's Corner and is part of the Great Dismal Swamp National Wildlife Refuge. The Great Dismal Swamp National Wildlife Refuge, stretches across both Virginia and North Carolina and is one of the largest intact remnants of a vast freshwater swamp. It contains the Great Dismal Swamp Canal, the oldest human-made waterway in the region. As of the 2020 Decennial Census, Newland Township had a population estimate of 2,623.[2] This number is expected to increase due to an influx of residents from southeastern Virginia.



Newland Township is located within Pasquotank County, one of the 20 counties that fall under the CAMA jurisdiction.

[1]Pasquotank County Land Use Plan (2023). Pasquotank County. Retrieved June 11, 2024 from https://edocs.deq.nc.gov/CoastalManagement/DocView.aspx?dbid=0&id=318286&cr=1.

[2]U.S. Census Bureau. (n.d.) 2023 ACS Demographic and Housing Estimates. Retrieved June 11, 2024 from https://data.census.gov/map/060XX00US3713992260?layer=VT_2020_060_00_PY_D1&loc=36.4040,-76.4084,z11.1034.

2 Community Action Team

2.1 CAT Selection Process

Selecting and working with the Community Action Team (CAT) is a key component of the RCCP. The CAT is a multi-disciplinary committee that contains members of the community with expertise and knowledge of the county. This committee met several times throughout the year to help guide the development of the resilience strategy. Specifically, the CAT assisted the County in engaging community members, provided input on the risk and vulnerability assessment including which critical assets were included, identified strategies and actions, and reviewed deliverables. A total of two meetings were held with the CAT. Materials for these meetings with the CAT are provided in the Appendix A of this report. County staff recommended the initial roster of CAT members. The composition of the Newland Township CAT included several residents who are also farmers and the emergency management director for the Albemarle Region. Members have unique knowledge of drainage issues around the township as well as how changing weather patterns have impacted local farmers. The CAT members are well connected to community lifelines, such as the churches and Ruritans Club.

The CAT Champion was Brian Parnell, Emergency Management Director for the Albemarle Region. Director Parnell served on both the CAT for Newland Township as well as Elizabeth City. He provided distinct knowledge of the emergency response protocols, programs, and projects in the region. This list of members and their affiliation is provided in Table 1.

Table 1. CAT Member List

Name	Affiliation	Contact
Kevin Brickhouse	Pasquotank County Planning Board	k_brick@hotmail.com
Joseph Gregory	Pasquotank County Planning Board	jpgregoryjr@msn.com
Charles Jordan	Chair of the Board of Commissioners	jordanc@co.pasquotank.nc.us
Glenn Harris	Soil and Water Conservation Supervisor	harrisgy@gmail.com
Bill Kruse	Chairman, Pasquotank County Planning Board	billkruse46@gmail.com
John Spence	Area Farmer	johnspence75@gmail.com
Brian Stallings	Stallings & Stallings Farms	bstallings2@yahoo.com
Brian Parnell	Pasquotank-Camden Emergency Management	parnellb@co.pasquotank.nc.us

3 Vision and Goals

3.1 Review of Existing Vision and Goal Statements

One of the initial steps in the RCCP Planning Handbook is to review and inventory existing plans, ordinances, policies, and programs to identify common vision and goal statements. This effort can also be useful in better understanding ongoing and past planning effort that could shape the Resilience Plan. The intention of this exercise was to document critical assets for the risk assessment, review past hazard assessments to understand data available, and document relevant actions related to climate resilience. Table 2 includes a brief description of each plan or report that was reviewed. The CAT was given an opportunity to expand this selection and recommended additional resources to fill in gaps.

Table 2. Review of Existing Vision and Goal Statements

Scale	Title of Plan	Relevant Vision or Goal Statements
County	Pasquotank County Land Use Plan 2023	• Enhance and restore natural areas that protect against natural and coastal hazards. • Maintain and enhance the water quality of coastal and inland waters and associated natural areas. • Direct development away from sensitive environmental areas and future flood prone areas, and toward areas with sustainable infrastructure. • Preserve the quiet, rural, agricultural character and respect farming and other rural land uses. • Begin planning for and adapting to climate change, including avoiding and becoming more resilient to disruptions from natural hazards. • Provide adequate recreational opportunities for residents and visitors, including access to coastal waters with facilities that encourage ecotourism. • Respect, embrace, and encourage a diversity of community participation. • Pursue infrastructure improvements to meet the needs of the future population.
Regional	Albemarle Regional HMP 2015-2020	Goals in the Albemarle Regional HMP: 1. Reduce the risk of loss of life and personal injury from natural hazards. 2. Reduce the risk and impact of future natural disasters by regulating development in known high hazard areas. 3. Maintain critical facilities in functional order. 4. Protect infrastructure from damage. 5. Ensure that hazard mitigation is considered when redevelopment occurs after a natural disaster. 6. Provide education to citizens that empowers them to protect themselves and their families from natural hazards. 7. Fulfill Federal and State requirements for receipt of future disaster recovery and hazard mitigation assistance. 8. Improve interjurisdictional cooperation and coordination, especially regarding the reduction of natural hazard impacts.
State	North Carolina Climate Risk Assessment and Resilience Plan 2020	Guiding Principles of North Carolina Resilience Plan: 1. Act quickly and decisively to reduce the most harmful impacts of climate change – flooding, drought, landslides, and wildfires. 2. Act thoughtfully and collaboratively to develop equitable solutions for the most socially challenging effects of climate change. 3. Invest in safe, affordable, and connected communities. 4. Strengthen regional economies. 5. Support healthy communities, local identity, and recreational access to nature. 6. Implement resilience best practices.

3.2 Selecting Vision and Goal Statements

Vision and Goal Statements were developed for this Resilience Strategy with input from the Community Action Team (CAT).

Vision Statements:

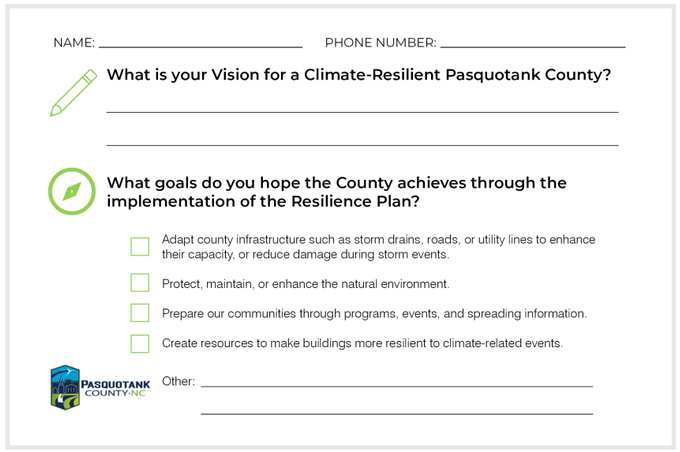
"The vision is an aspirational statement for where the community wants to be in the future (e.g., in the next 10 or more years), particularly in relation to coastal hazards" (RCCP Planning Handbook).

Goal Statements:

"Specific, measurable goals will help the community identify steps that can be taken to achieve the vision. Resilience goals can relate to preparedness, recovery, community engagement, construction, restoration, etc" (RCCP Planning Handbook).

The County gathered input from the CAT on vision and goal statements for the Resilience Strategy. During the first CAT meeting, example vision statements and tips were provided during a presentation with an opportunity to use the online polling platform, Slido, to provide answers. A google form survey was also provided during the meeting for the CAT to fill out after the meeting to provide any additional input.

The County held an open house in Newland Township on October 30, 2023 at the Mount Carmel Missionary Baptist Church with close to 70 people in the room. At this event, the County presented on several initiatives taking place in Newland Township, including the development of the Resilience Strategy. After hearing a brief presentation on RCCP, residents and stakeholders were given a chance to submit their own vision and goal statements, for a chance to win a raffle for a 300-dollar grocery store gift card. The County selected this incentive because of the high cost of food due to inflation to help address food insecurity and acknowledge time taken by residents out of busy schedules to attend.


NAME: _____ PHONE NUMBER: _____

What is your Vision for a Climate-Resilient Pasquotank County?

_____

_____

What goals do you hope the County achieves through the implementation of the Resilience Plan?

- ☐ Adapt county infrastructure such as storm drains, roads, or utility lines to enhance their capacity, or reduce damage during storm events.
- ☐ Protect, maintain, or enhance the natural environment.
- ☐ Prepare our communities through programs, events, and spreading information.
- ☐ Create resources to make buildings more resilient to climate-related events.
- ☐ Other: _____

PASQUOTANK COUNTY-NC

Cards and flyers were provided for vision and goal setting activity.

3.3 Vision Statements

I envision Pasquotank County...

- **I envision Pasquotank County** balances economic development and environmental conservation and resiliency activities.
- **I envision Pasquotank County** as a place that is the jewel of the Inner Banks.

In the future, our community will be...

- **In the future, our community will be** protected from sea-level rise and higher intensity storm events.
- **In the future, our community will be** able to repair past rifts and transform into a hub of art, nature and scholastic beauty that attracts regular visitors and their revenue.

To reduce the impacts of climate hazards/change...

- **To reduce the impacts of climate hazards,** the County will integrate planning, funding (from all available sources) and implementation of effective measures to protect residents and economic growth.
- **To reduce the impacts of climate hazards,** the County will update and maintain modern infrastructure and support systems, including decreasing the amount of flooding that occurs during non-emergency weather events.
- **To reduce the impacts of climate change,** the County will have the ditches dug and widened to allow less water flooding the roads. The roads are difficult to travel on, and water recedes slowly.
- **To reduce the impacts of climate change,** the flooding in rural areas will be addressed, in Newland especially.
- **To reduce the impacts of climate change,** climate education and training will be provided for local students through the use of resilient education programs, especially in the underrepresented communities and empowering local activists to take action.

3.4 Goal Statements

1. Adapt county infrastructure to enhance their capacity or reduce damage during storm events.
2. Protect, maintain, or enhance the natural environment.
3. Prepare our communities through programs, events, and spreading information.
4. Create resources to make buildings more resilient to climate-related events.

4 Review of Existing Efforts

4.1 Selecting Existing Plans and Reports

The RCCP Planning Handbook suggests reviewing existing plans and reports to better understand ongoing and past planning efforts that could shape the Resilience Plan. The intention of this exercise was to document critical assets for the risk assessment, review past hazard assessments to understand data available, and document relevant actions related to climate resilience. Table 3 includes a brief description of each plan or report that was reviewed. The CAT was given an opportunity to expand this selection and recommended additional resources to fill in gaps.

Table 3. Existing Local and Regional Plans

Scale	Title of Plan	Summary
Regional	Albemarle-Pamlico Comprehensive Conservation and Management Plan (CCMP) 2012-2022	The Pasquotank River Basin is a part of the Albemarle-Pamlico Estuarine System. The Albemarle-Pamlico National Estuary Partnership (APNEP) implemented the plan at the watershed scale to protect and restore the estuarine system. The CCMP presents an adaptive management cycle to identify gaps in knowledge, protect the existing ecosystem, restore the ecosystem, engage the public, and monitor the ecosystem. Some of the proposed objectives and actions related to improving hydrology and ecosystem health are restoring riparian buffer systems, utilizing living shorelines, removing in-stream barriers for fish, and restoring oyster habitats.
	DRAFT Pasquotank River Basin Water Resources Plan 2021	The draft basin plan is the fourth document developed by the DEQ for the Pasquotank River basin that addresses water quality and quantity issues within the basin. The basin plan provides information at the watershed scale, stream assessments, and special studies. Information is also provided on permitted and registered activities, water quality initiative options, and a summary of water usage in the basin.

Scale	Title of Plan	Summary
Regional	Albemarle Regional Hazard Mitigation Plan 2020-2025	The HMP was prepared by members of the Hazard Mitigation Planning Committee (HMPC) to meet federal requirements to reduce losses generated by natural disasters. Pasquotank County has its own community profile, risk assessment, and capability assessment. The risk assessment included an overall number of at-risk critical infrastructure and resources and high potential loss properties.
Pasquotank County	Pasquotank County, North Carolina Stormwater Design Manual 2009	The storm water drainage manual provides guidance to design professionals in the development of residential, commercial, and industrial projects in the county. The contents of this manual include management plan and drainage study requirements, best management practice design criteria, floodplain and floodway management, stormwater management permitting, lot grading, and maintenance of stormwater improvements, and appendixes with relevant procedures, checklists, and floodplain maps.
	Pasquotank County Land Use Plan – Coastal Area Management Act (CAMA) 2023	The land use plan guides the growth, development, and natural resources conservation for the county. Through public engagement, a shared community vision and eleven key goals are presented. The top priorities from a public survey involve flooding, drainage, and stormwater. The plan provides recent demographic, economic, housing, and development information. The natural systems chapter highlights several Natural Systems Areas of Environmental Concern (AECs), water quality, existing land use, natural hazards, and community facilities. The future land use chapter highlights character, focal/enhancement, and natural hazard areas.
	DRAFT Hurricane Matthew Resilient Redevelopment Plan – Pasquotank County 2017	The redevelopment plan provides a rebuilding and revitalization strategy for communities impacted by Hurricane Matthew in 2016. As a part of the assessment for this plan, at-risk housing developments, infrastructure, road/bridge flooding areas, and environmental impacts were identified. A section on resilience and revitalization strategies for housing, economic development, infrastructure, and environment provided a list of priority actions based on public engagement. The results include high priority strategies such as acquisitions, building elevations, and drainage improvements.
	Pasquotank Comprehensive Transportation Plan 2016	The Comprehensive Transportation Plan provides analysis and recommendations regarding the existing and future transportation system of Pasquotank County.
Pasquotank County/ Elizabeth City	Pasquotank County/ Elizabeth City Advanced Core Land Use (CAMA) Plan 2004	The CAMA land use plan provides a framework to guide local governmental officials on decisions that affect land development. The content of this plan included identifying and analyzing significant existing and emerging conditions, key planning issues, and planning for the future of land use and development goals.
	Pasquotank County/ Elizabeth City CAMA Advanced Core Land Use Plan Status Report 2022	The status report provides updates on specific strategies proposed in the 2004 Advanced Core Land Use Plan.

4.2 Identified Gaps

From the review of existing local and regional plans, gaps in the types of reports available were identified. Gaps in plans were identified as the following:

- Capital Improvement Plans
- Asset Management Plans
- Emergency Operations Plan
- Resiliency Plan

The gaps identified in this process were considered when selecting the CAT and conducting the risk and vulnerability analysis. The Pasquotank-Camden Emergency Operations plan is expected to be released in 2024 and will address some of the gaps around emergency management. Brian Parnell of the Pasquotank-Camden Emergency Management Department was included on the CAT and provided input related to this document. Although flood mitigation and water management issues were addressed in some of the existing plans, there was little information regarding resiliency focused efforts made within Pasquotank County. Resiliency is considered in the risk and vulnerability assessment stage of this project. Strategies that related to resiliency are addressed in the project portfolio.

5 Community Engagement Strategy

5.1 Engagement Approach

Engagement with community members, including residents and stakeholders, is an integral element of the RCCP planning process. The Planning Handbook recommends developing an engagement plan that considers a variety of stakeholders and methods to gather meaningful feedback successfully and inclusively. The Planning Handbook emphasizes elevating the voices of historically underrepresented communities, environmental justice populations, and socially vulnerable residents.

Community engagement event held at the Newland Township fire station to share risk and vulnerability assessment findings and gain feedback on draft actions.

5.2 Strategies and Methods of Outreach

Pasquotank County understands that many residents experience planning related fatigue, and developed an engagement approach that would reduce barriers to participation using both in-person and virtual events. There were two events held for the Newland Township Resilience Strategy focused on vision and goal setting and development of strategies and actions.

On October 30, 2023, the County hosted a workshop in the township to give an overview of ongoing planning efforts, including the RCCP process. At this event, residents were able to provide their own vision and goal statement ideas. The County also provided an online survey for those that wanted to share it with their friends and neighbors, or fill out statements on their own time, to enhance participation.

The County hosted an open house at the Newland Township fire station on May 15, 2024. The open house was an opportunity for the community to gather and share refreshments, provide input on the risk and vulnerability assessment, and participate in “dot-voting” on draft actions. There was also a station where residents could submit their own action ideas or general feedback.

The County also deployed “equitable engagement modifiers ”to expand the reach of engagement. These modifiers included having activities for children such as climate-related colorings sheets and stickers, providing food and beverages at events, and hosting an “open house” so that residents could drop in at their convenience, rather than having a set start time. The County also chose to host its event at a location convenient to many residents, the Newland Township Fire Station.

Equitable Community Engagement

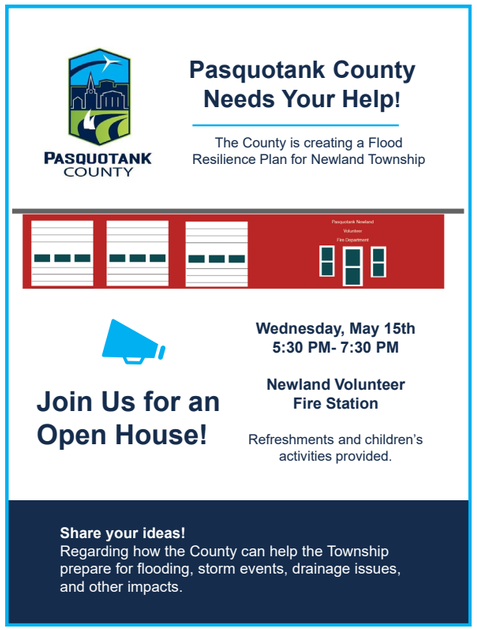
Equitable community engagement requires inclusivity and accessibility for all community members. Methods for equitable engagement include compensating community members for participation, providing food or childcare at engagement events, using accessible language to convey technical information, using standards for accessibility for online and print content, conducting engagement at pre-existing events, and using community liaisons to build trust and bridge gaps.

5.3 Community Involvement Results

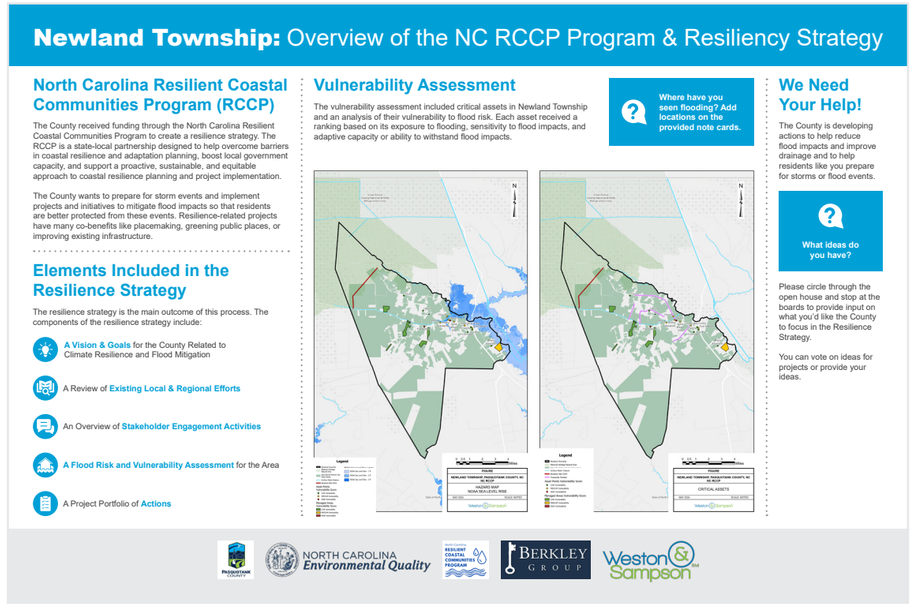
During the open house event, on May 15, 2024, the County gathered feedback on the following:

- Areas of frequent flooding
- The vulnerability assessment results
- Resident and stakeholder priorities for action development
- Resident and stakeholder ideas for new actions

The open house was set up in a series of stations where participants could talk with a county staff member, a resilience planner from Weston & Sampson, or a CAT member. Comment cards were used to collect feedback on frequently flooded areas; a dot-voting exercise was used to prioritize actions that were developed by the County, Weston & Sampson, and the CAT, and a free-form sticky-notes poster was used for all other ideas or concerns, including new actions.

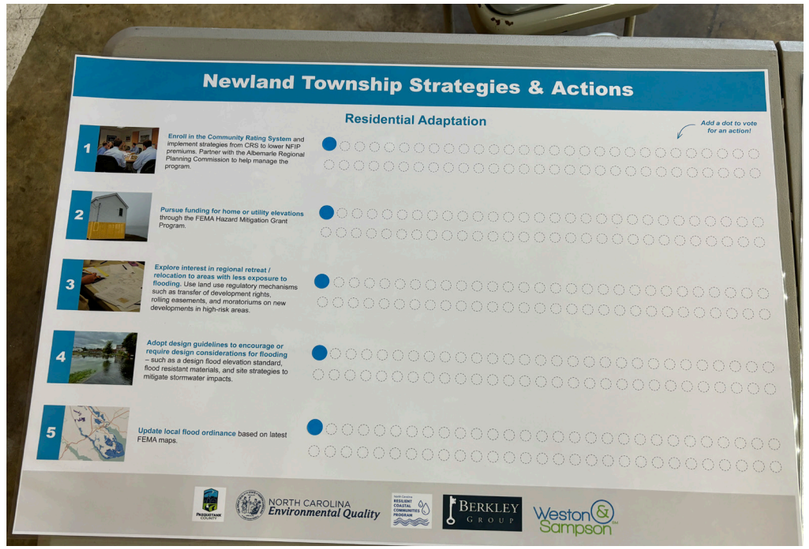


Flyer announcement posted for May open house.



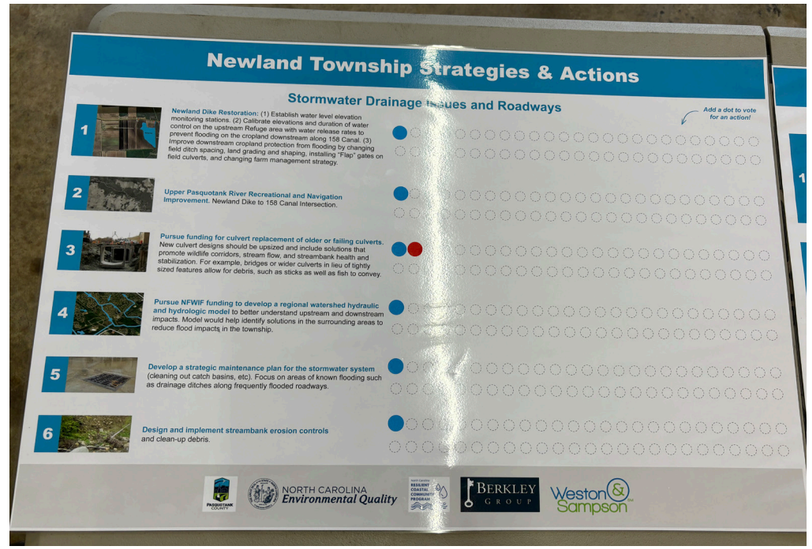
Overview board detailing the NC RCCP and vulnerability assessment results that was displayed during the open house.

Tables at the open house were set up with posters for dot-voting and an opportunity to leave additional ideas or concerns with sticky-notes.



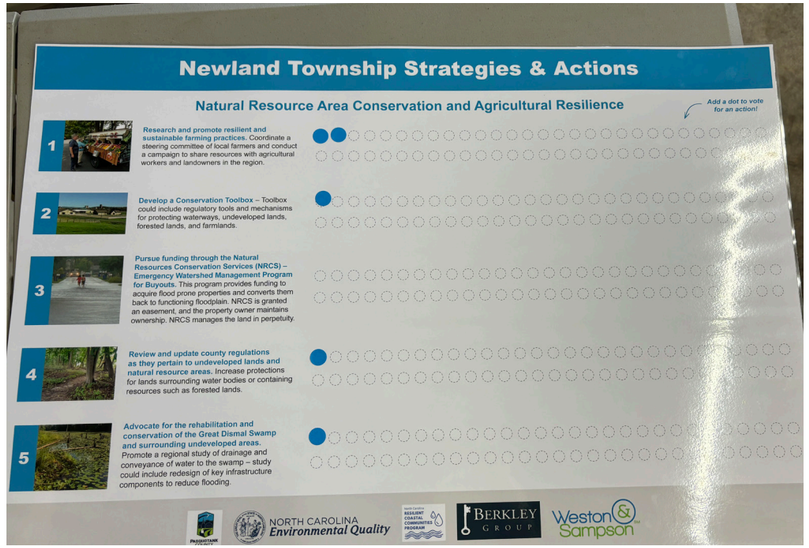
Residential Adaptation Actions

All strategies received the same score: Enroll in the Community Rating System; Pursue funding for home or utility elevations; Explore interest in regional retreat/relocation to areas with less exposure to flooding; Adopt design guidelines to encourage or require design considerations for flooding; Update local flood ordinance



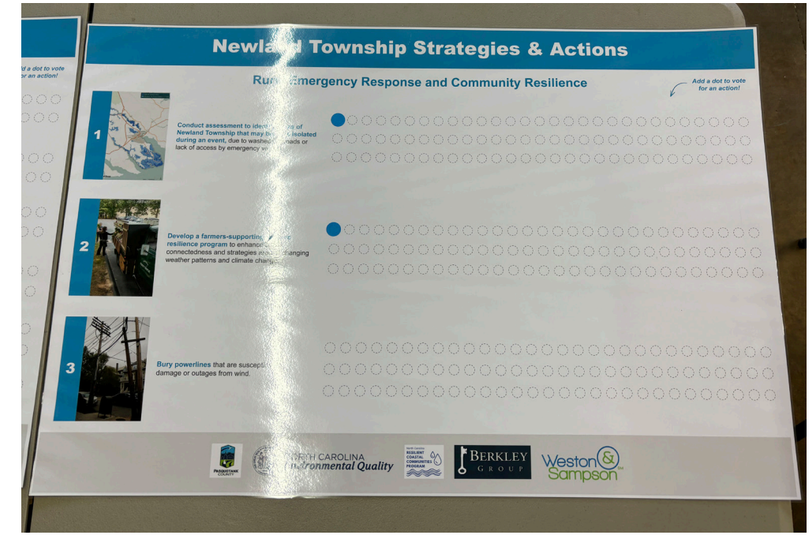
Stormwater Drainage Issues and Roadways

Highest ranked action: Pursue funding for culvert replacement of older or failing culverts



Natural Resource Area Conservation and Agricultural Resilience

Highest ranked action: Research and promote resilient and sustainable farming practices



Rural Emergency Response and Community Resilience

Highest ranked action: Conduct assessment to identify areas of Newland Township that may be isolated during an event; Develop a farmers-supporting-farmers resilience program

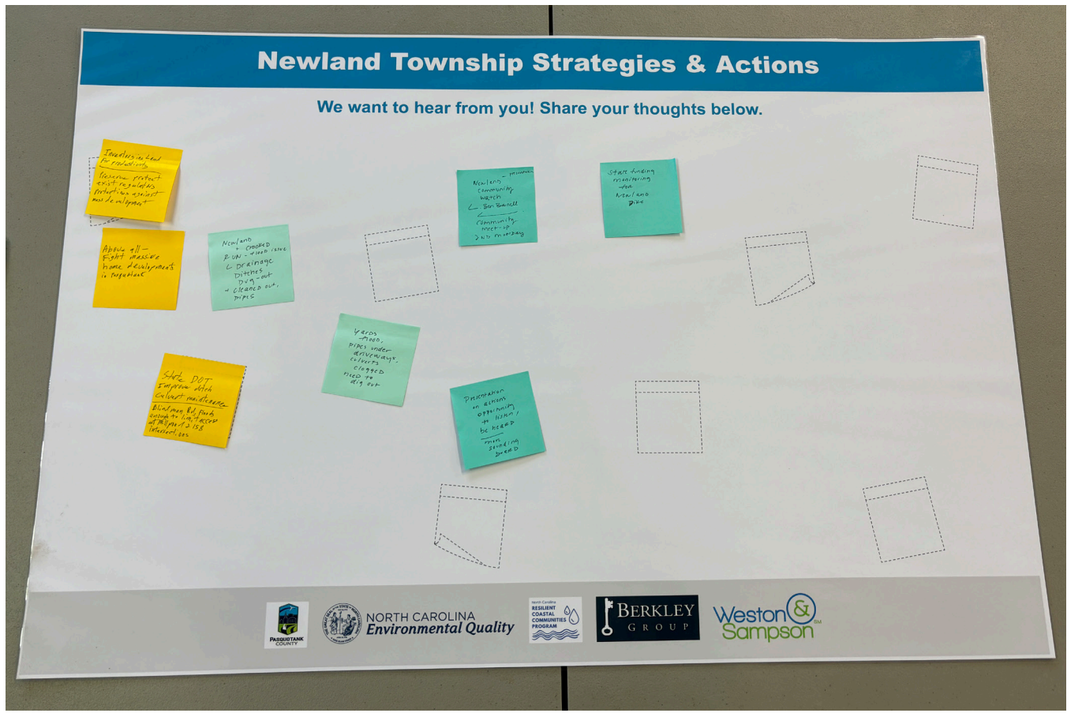
Additional Feedback

The following comments were received from participants at the open house:

- More housing supply and affordable housing is needed, in addition to the infrastructure to support it.
- Low-lying ditches are eroding and need maintenance.
- Complete a stormwater inventory and masterplan.
- Drainage ditches need to be cleaned out and debris removed.
- College Park creates dangerous conditions when flooded.
- Flooding in residential yards is an issue and makes the property unusable. Surrounding roads often flood.
- Stormwater drains on Southern Avenue are too small.
- Ditches behind Southern Avenue need to be cleaned.

Limitations

Although the number of participants was not as high as desired, many participants stayed for the duration of the open house and provided personal stories or accounts of flooding and storms. Participants were eager to learn more about next steps, and how they could continue to be involved.



6 Risk and Vulnerability Assessment

6.1 Overview of the Risk and Vulnerability Assessment

The risk and vulnerability assessment utilizes critical asset data that was identified and sourced from desktop analysis and the Community Action Team (CAT) assembled as a part of this program. The risk and vulnerability assessment is a key component of Phase 1 of the RCCP and informed Phase 2, the project portfolio. The project portfolio includes potential projects that help mitigate the vulnerability of critical assets and help enhance the resilience of the Newland Township's systems.

6.2 Critical Assets

The critical assets and natural infrastructure assets used in this assessment were identified using the NC Resilient Coastal Communities Planning Handbook. Critical assets mirror categories found in the 2020 Albemarle Regional Hazard Mitigation Plan. For purposes of this assessment, critical assets and natural infrastructure assets were defined as places that serve as community lifelines. The synthesized list of assets (Table 4) is provided below. The complete list of assets can be found in Appendix B. The map of asset locations (Figure 1) can be found in Appendix C. As a result of this process, 22 critical assets in Newland Township were mapped and assessed. This list of assets was shared with the CAT during a workshop meeting in December of 2023 and adjustments were made to this list based on their feedback.

Table 4. Asset Types

Asset Type	Count of Assets
Natural Resources	7
Community	6
Local Businesses / Other	4
Infrastructure/ Utilities	3
Government Services	2

6.3 Social Vulnerability

Social vulnerability is a key component of understanding Newland Township's overall vulnerability to climate impacts and natural hazards. Social vulnerability refers to social, economic, or physical characteristics of residents that may make them more susceptible to the impacts of climate change. For example, a resident who is lower income, would likely have less material or financial resources to recover from a natural disaster.

For this analysis, the CDC's Social Vulnerability Index (SVI) was used to access data concerning socially vulnerable populations. The CDC's SVI uses U.S. Census Data at the census tract level based on 15 social factors. These social factors are detailed in Table 5. A map of the socially vulnerable areas in reference to critical assets are provided in Appendix A of this document. For this analysis, the overall theme percentile scores were used as a criterion for sensitivity. A higher score (closer to 1) corresponds to a higher SVI, where a lower score (closer to 0) indicates a lower SVI.

Table 5. CDC Vulnerability Index

Theme	Factors
Socioeconomic Status	Below 150% Poverty
	Unemployed
	Housing cost burdened
	No high school diploma
	No health insurance
Household Characteristics	Aged 65 or older
	Age 17 or younger
	Civilian with a disability
	Single-parent household
	English language proficiency
Racial & Ethnic Minority Status	Hispanic or Latino, Black or African American, American Indian or Alaska Native, Native Hawaiian or Pacific Islander, Two or more races, Other races
Housing Type & Transportation	Multi-Unit Structures
	Mobile Homes
	Crowding
	No Vehicle
	Group Quarters

Newland Township has a low SVI score. Social vulnerability does not vary much across the township, but there is a higher SVI concentrated toward the eastern portion of the township. Figure 2 in Appendix B provides a map of the vulnerability assessment scored critical assets overlaid on top of the SVI RPL Themes score.

6.4 Hazard Identification

To better understand potential climate hazards that the County faces, an existing conditions analysis was conducted in Phase 1. The existing conditions analysis identified relevant reports and assessments that identified potential hazards and resilience strategies for the County and the Albemarle region.

The climate hazards represented in this analysis were identified by the 2020 Albemarle Regional Hazard Mitigation Plan and are required by RCCP as a part of the vulnerability assessment.

These hazards include historical flooding (includes precipitation data), present-day coastal and riverine flooding, storm surge, and future sea level rise projections. The identified hazards were mapped using ArcGIS Pro as shown in Appendix B of this document.

Table 6. Hazard Identification & Sources

Hazard	Dataset
Historical flooding	CAT Observed Frequently Flooded Areas
Present-day tidal and riverine flooding	NC FRIS[3]
Category 2 Storm Surge	National Storm Surge Hazard Maps[4]
Future Sea Level Rise Projections	NOAA[5]

6.5 Vulnerability Assessment

The vulnerability assessment quantified the vulnerability of critical assets and natural infrastructure (assets) against identified hazards. Vulnerability is determined by using the vulnerability equation as outlined by the RCCP Planning Handbook. The definitions used for this assessment reflect those provided in the *Vulnerability Assessment and Adaptation Framework, Third Edition*[6] released by the Federal Highway Administration.

Vulnerability = **Exposure** + **Sensitivity** - **Adaptive Capacity**

Whether an asset is in an area experiencing direct climate impacts

How the asset fares when exposed to a climate event

The system's ability to cope with climate impacts

[3] https://fris.nc.gov/fris/Home.aspx?ST=NC
[4] https://www.nhc.noaa.gov/nationalsurge/
[5] https://coast.noaa.gov/slr/#/layer/slr
[6] https://www.fhwa.dot.gov/environment/sustainability/resilience/adaptation_framework/index.cfm

The scoring methodology used for this analysis is shown in Table 7 & 8.

Table 7. Indicator Descriptions for Vulnerability Components

Component	Indicator	Description
Exposure	Flood Risk Information System (FRIS) for NC (Present)	To determine historical/present-day exposure to flooding, the 1% and 0.2% layers were used. Exposure of, in, or out of these layers was based on the parcel polygon that the asset resided in. If the asset polygon was exposed, then the asset was marked as exposed.
	Category 2 Storm Surge	To determine the potential for flooding caused by hurricane storm surge exposure, the Category 2 event was selected. This selection was made based on Pasquotank County's hurricane history. The most severe hurricane to hit Pasquotank County was Category 2, in 2014.[7]
	NOAA SLR Scenarios (Projected)	To determine the potential for future flooding caused by sea level rise (SLR), the 1, 2 & 3 ft NOAA projections for SLR were incorporated in this analysis. The planning horizon of up to 3 feet exceeds the minimum Step 6a requirements of 30 years of SLR. Using the local data extrapolated for Newland Township, the correlation is around 2070.
Sensitivity	SVI by Census Tract: RPL_ Themes	To determine the social vulnerability component of sensitivity, RPL_Themes percentile scores were used as a criterion. A higher score (closer to 1) corresponds to a higher SVI or higher vulnerability, where a lower score (closer to 0) indicates a lower SVI or lower vulnerability. This is a CDC defined index.[8]
	Frequently Flooded Areas	To determine the historic flooding observations, proximity to frequently flooded areas was used in this analysis. These areas were defined by the CAT in the first CAT meeting. Assets within 1000 ft were considered as exposed.
	Criticality	To determine sensitivity of assets, the criticality (consequence of failure) was considered. Criticality relates to how integral an asset is during a hazard event.
Adapative Capacity	Redundancy of Asset	To determine the ability of an asset to cope with exposure, redundancy was used. The determination of redundancy was based on the presence of multiple assets with the same asset type.

[7] https://coast.noaa.gov/hurricanes/#map=4/32/-80
[8] https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

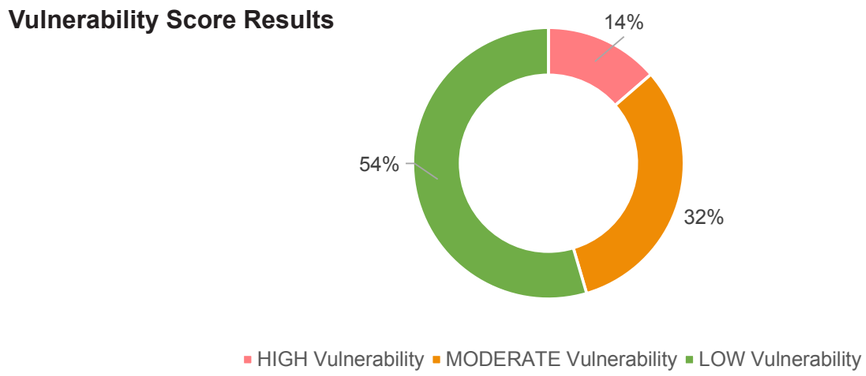
Table 8. Indicator Scoring for Vulnerability Components

Component	Indicator	Scoring			
		0	1	2	3
Exposure	Flood Risk Information System (FRIS) for NC (Present)	Not Exposed		0.2% Exposure	1% Exposure
	Category 2 Storm Surge	Not Exposed		Exposed	
	NOAA SLR Scenarios (Projected)	Not Exposed	3 ft Exposure	2 ft Exposure	1 ft Exposure
	Frequency Flooded Areas	Not Within 1000 ft		Within 1000 ft	
Sensitivity	SVI by Census Tract: RPL_Themes	<0.25	0.25 - 0.5	0.5 - 0.75	>0.75
	Criticality	Not critical during hazard	Somewhat critical during hazard	Critical during hazard event.	
Adapative Capacity	Redundancy of Asset	No other assets	1 other asset		

Scoring for each of the three components was then scaled such that the final vulnerability scores ranged from 0 to 6. Final vulnerability scores were then classified into Low, Moderate, and High Vulnerability.

6.6 Vulnerability Assessment Findings

The results of the vulnerability assessment yield the following distribution of vulnerability scores:



The resultant vulnerability scores for all assets are in Table 10 in Appendix B and Map 3 in Appendix C. The resultant High and Moderately High Vulnerability assets are shown in Table 9 below and in Figure 4 in Appendix C.

Table 9. Vulnerability Asset Results

Asset Name	Asset Type	Vulnerability Score
Utility Substation	Utility Substation	HIGH Vulnerability
Pasquotank Newland Volunteer Fire Department	Fire Station	HIGH Vulnerability
Newland Dike Ditch	Dike Ditch	HIGH Vulnerability
Bethel AME Zion Church	Church	MODERATE Vulnerability
Mount Carmel Missionary Baptist Church	Church	MODERATE Vulnerability
Newland United Methodist Church	Church	MODERATE Vulnerability
Duck Thru/ Shell	Fuel Station	MODERATE Vulnerability
Newland Ruritan Building	Community Center	MODERATE Vulnerability
Solid Waste Convenience Site	Solid Waste Site	MODERATE Vulnerability
North Carolina Coastal Land Trust Easement - Northside Road	Managed Areas	MODERATE Vulnerability
Family Dollar	Grocery	LOW Vulnerability
Dollar General	Grocery	LOW Vulnerability
Jones Lumber Company	Major Employer	LOW Vulnerability
Great Dismal Swamp National Wildlife Refuge and Vicinity	Natural Heritage Area	LOW Vulnerability
Ramoth Gilead Baptist Church	Church	LOW Vulnerability
Cell Tower	Cell Tower	LOW Vulnerability
Pasquotank County Open Space - Palmer Road	Managed Areas	LOW Vulnerability
North Carolina Coastal Land Trust Easement - US Highway 158, Turnpike Road, Lynchs Corner Road	Managed Areas	LOW Vulnerability
Lamb's Grove Baptist Church	Church	LOW Vulnerability
NC Division of Mitigation Services Easement	Managed Areas	LOW Vulnerability
Pasquotank County Open Space - HWY 158	Managed Areas	LOW Vulnerability
North Carolina Coastal Land Easement - US Highway 158	Managed Areas	LOW Vulnerability

Additional hazard maps for flood hazards, sea-level rise, and Category 2 hurricane inundation with the scoring for all critical assets are found in Appendix C, Figures 4 – 6.

6.7 Risk Assessment

Risk estimation is a critical component to using vulnerability assessment results and making informed decisions about asset management and project prioritization. For this assessment, parcel value data was used to represent the risk associated with each asset.

Methodology

After assigning vulnerability scores to each of the critical assets, the financial risk was calculated using the North Carolina Parcel dataset. The total parcel value includes the appraised value for land (LANDVAL) and appraised value for improvements (IMPROVAL). The parcel data selected for this assessment represents the most up-to-date attribute information for North Carolina. This dataset was used to represent the value of the land, in addition to the value of the built improvement. Building assessors data was not selected due to the lack of approximated values for natural land parcel areas.

Results

The results of this analysis yielded the grouped asset values, shown in Table 10.

Table 10. Grouped Risk Estimates by Sector

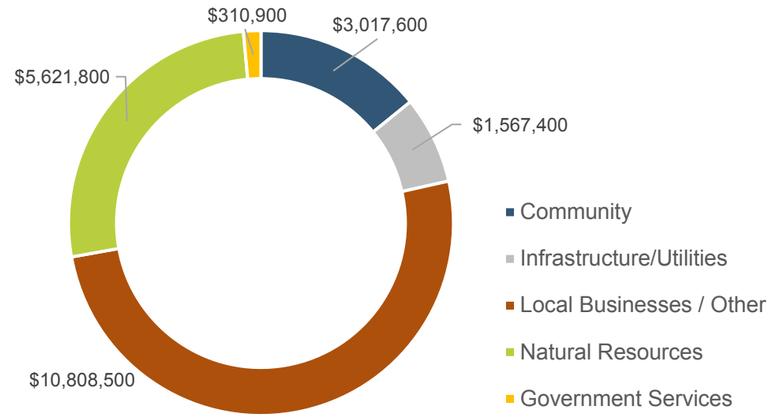
Sector	Number of Critical Assets at Risk	Asset Value
Local Businesses/ Other	4	$ 10,808,500
Natural Resources	7	$ 5,621,800
Local Businesses/ Other	7	$ 3,017,600
Infrastructure/ Utilities	3	$ 1,567,400
Government Services	2	$ 310,900

The sector with the highest value at risk was *Local Business/ Other*. This sector included fuel stations, grocery stores, and a major employer. Some of the highest scoring values were by Jones Lumber Supply Duck/ Shell, Family Dollar, Dollar General. These assets were all valued over $1 million each.

Natural Resources had the second highest value of assets at risk. This sector included Natural Heritage Areas and Managed Areas. The Great Dismal Swamp received a score of over $5 million, making up over 90% of the value for the *Natural Resources* sector. Another critical asset in this sector was the Newland Dike Ditch, valued over $1 million.

The Duck Thru/ Shell has a moderate vulnerability and high risk score.

Risk Assessment Results



Limitations

The value of these assets can change over time since they are based on an appraised value for land and improvements. Financial data associated with parcels does not represent the value of each type of asset, rather it represents the value of the land that the asset is on, and the improvements made to the parcel. The risk analysis does not quantify actual flood damage from a storm. The asset value is not controlled based on vulnerability in this exercise. Performing that type of risk assessment would require a more detailed analysis.

7 Project Portfolio

7.1 Selecting Priority Projects

Phase 2 of the RCCP develops a portfolio of resilience projects aimed at reducing exposure and sensitivity to hazards as well as strengthening the adaptive capacity of community assets and vulnerable populations. This strategy builds upon foundational plans and projects (detailed in Section 4) and prioritizes recommendations for the Project Portfolio.

A list of potential projects was shared during the May Open House and with the CAT to gain feedback and clarity on what projects would be prioritized for the County. Each priority project is provided a description based on the prescribed information provided in the RCCP Planning Handbook.

The priority projects for the County include:

- Research and promote resilient and sustainable farming practices and develop a farmers supporting farmers program.
- Develop a Conservation Toolbox and review and update county regulations as they pertain to undeveloped lands and natural resource areas; integrate climate resilience, flood mitigation, and stormwater management into existing ordinances.
- Pursue funding for buyouts through the Natural Resources Conservation Services (NRCS)-Emergency Watershed Management Program.
- Advocate for the rehabilitation and conservation of the Great Dismal Swamp and surrounding undeveloped areas.
- Restore Newland Dike.
- Pursue funding for culvert replacement of older or failing culverts.
- Pursue NFWF funding to develop a regional watershed hydraulic and hydrologic model.
- Develop a strategic maintenance plan for the stormwater system.
- Design and implement streambank erosion controls.
- Enroll in the FEMA Community Rating System (CRS).
- Pursue funding for home or utility elevations.
- Explore interest in regional retreat/ relocation to areas with less exposure to flooding.
- Adopt design guidelines to encourage or require design considerations for flooding.
- Conduct assessment to identify areas of Newland Township that may become isolated during an event.
- Bury powerlines.

Research and promote resilient and sustainable farming practices and develop a farmers supporting farmers program

Project Description

Coordinate a steering committee of local farmers and conduct a campaign to share resources with agricultural workers and landowners in the region.

Enhance social connectedness and discuss strategies around changing weather patterns and climate change.

Location

Newland Township

Source

County and Weston & Sampson

Scoping Questions

- What types of farming practices are most common currently?
- What training programs currently exist and how could these be leveraged to enhance and expand practices to conserve soil and water, encourage biodiversity, and promote energy conservation/renewable resources?
- What systems are currently in place that facilitate sharing of information and resources?
- What characteristics are important to promote a diversity of perspectives on the steering committee?
- What is the best method for bringing this community together? Are there already meetings to capitalize on within the agricultural community?

Hazards Addressed

- ☑ Flooding
- ☑ Other: Drought, Storms
- ☐ All Hazards

Supporting Function

Agriculture

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☐ Infrastructure/Facility Retrofit
- ☑ Other: Non-regulatory program, community engagement

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

Pasquotank County, Steering committee of local farmers

Potential Partners

Future Farmers of America, Pasquotank Chapter

Existing Funding

Staff time

Potential Funding Sources

- NRCS Environmental Quality Incentives Program (EQIP)
- State 319 Nonpoint Source Funding
- County annual budget

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low | Medium | High

Priority Rating

Low | Medium | High

Does not relate to the immediate protection of life and safety, but important to economic health, food security and prosperity.

Develop a Conservation Toolbox.

Review and update county regulations as they pertain to undeveloped lands and natural resource areas; integrate climate resilience, flood mitigation, and stormwater management into existing ordinances.

Project Description

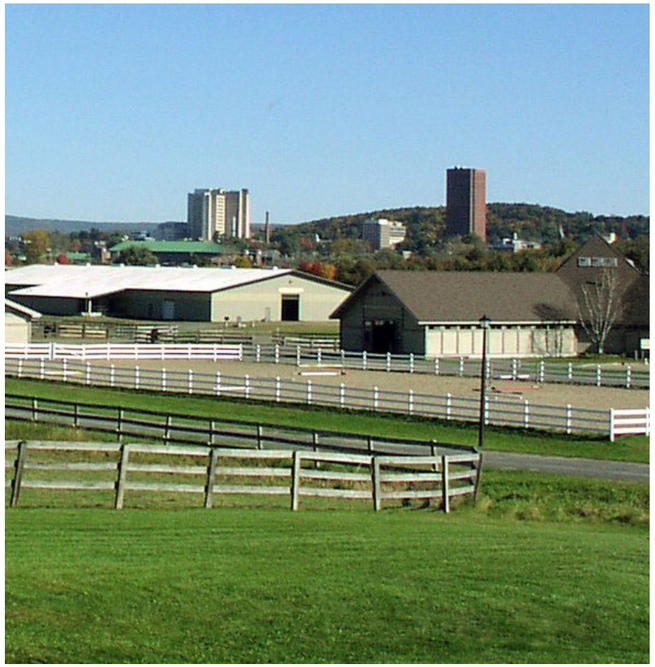
Toolbox could include regulatory tools, incentives, and best practices for protecting waterways, undeveloped lands, forest and farmlands, and provide standards for developing lands.

Increase protections for lands surrounding water bodies or containing resources such as forested lands. Integrate climate resilience, flood mitigation, or stormwater management best practices into existing regulations. Identify gaps and opportunities for new language or replacement language.

Update local flood ordinance to reflect latest FEMA Flood Insurance Rate Maps.

Location

County-wide



Source

County and Weston & Sampson

Scoping Questions

- What types of regulatory tools are already in place?
- What are the gaps or opportunities for new standards?
- Can regulations be aligned with Elizabeth City and neighboring communities to increase their regional impact?
- What best practices or precedents should be referenced?
- Which conservation organizations or other entities should be consulted in the process?
- Have undeveloped lands and natural resources areas been inventoried and mapped throughout the County?
- What regulations are currently in place that pertain to undeveloped lands and natural resource areas?
- What level of protection does the County want to provide to these areas?
- Is there public support for a land conservation/ greenbelt plan?

Hazards Addressed

- ☐ Flooding
- ☐ Other
- ☑ All Hazards

Supporting Function

General resiliency, biodiversity

Estimated Timeline

Short-term | Mid-term | Long-term

Type of Solution

- ☑ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☐ Infrastructure/Facility Retrofit
- ☐ Other

Responsible Entity

Pasquotank County Planning Department

Potential Partners

- Pasquotank County Utilities Department
- Private Property Owners
- Conservation Organizations
- Pasquotank County Inspections Department
- Pasquotank County Parks & Recreation Department
- Pasquotank County Board of Commissioners

Existing Funding

Staff time

Potential Funding Sources

County annual budget

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low | Medium | High

This will increase the overall resiliency of not only Newland Township, but Pasquotank County as a whole.

Priority Rating

Low | Medium | High

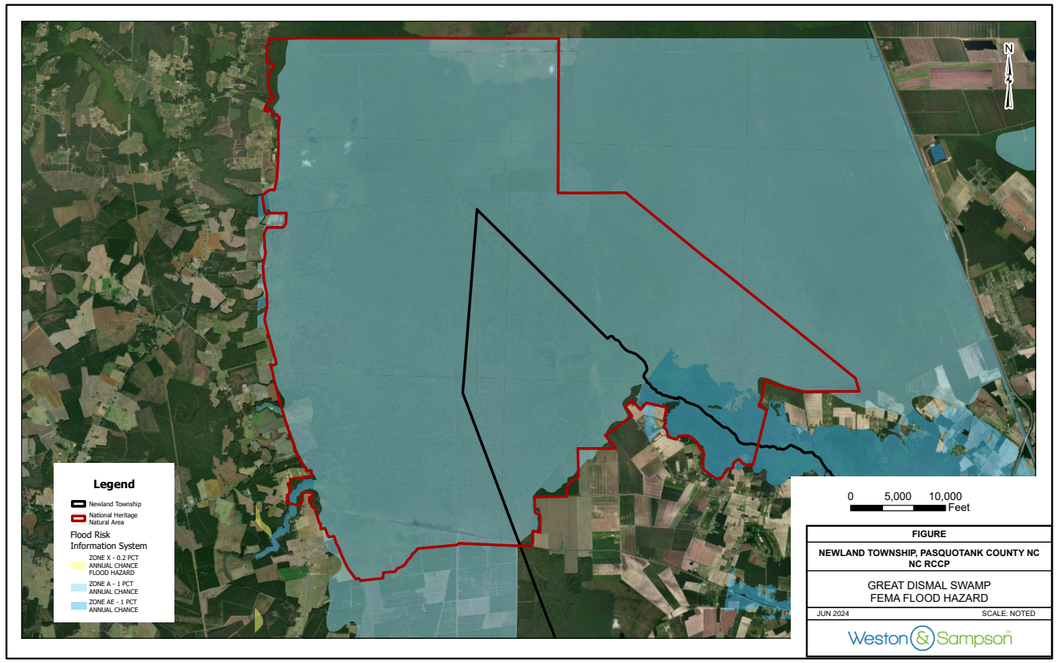
Advocate for the rehabilitation and conservation of the Great Dismal Swamp and surrounding undeveloped areas.

Project Description

Advocate for a regional study of drainage and conveyance of water to the swamp – study could inform the restoration of natural features or redesign of key infrastructure components to reduce flooding.

Location & Project Map

Great Dismal Swamp Region



Source

County and Weston & Sampson

Scoping Questions

- What areas of the Great Dismal Swamp are not under protection of US Fish and Wildlife or other land trusts?
- What restoration efforts have been effective in either North Carolina or Virginia to create capacity for flood storge and/or improve function of the Great Dismal Swamp?
- What are known existing drainage or flood issues in Newland Township caused by the alteration of the Great Dismal Swamp?

Hazards Addressed

- ☑ Flooding
- ☐ Other
- ☐ All Hazards

Supporting Function

Conservation, General Resiliency

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☐ Infrastructure/Facility Retrofit
- ☑ Other: Study, Drainage, Land Rehabilitation, and Conservation

Estimated Timeline

Short-term — Mid-term — Long-term

Responsible Entity

Pasquotank County Planning Department

Potential Partners

- Local land trusts (NC Coastal Land Trust, Trust for Public Land)
- US Fish and Wildlife Service
- US Army Corps of Engineers
- Conservation Organizations

Existing Funding

None identified

Potential Funding Sources

- North Carolina Land & Water Fund
- US Forest Service Community Forest and Open Space Conservation Program

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low — Medium — High

This area not only serves as naturally functioning floodplain but could increase recreational opportunities in the region.

Priority Rating

Low — Medium — High

The County has limited ability to conduct a study like this on its own but could create a regional collaboration effort.

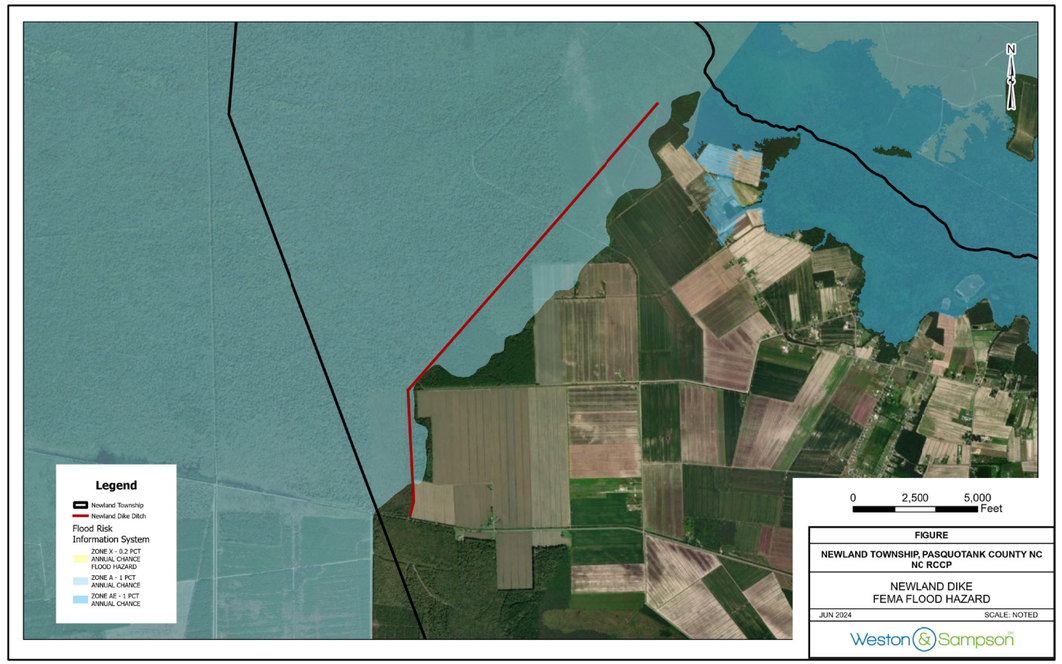
Restore the Newland Dike.

Project Description

(1) Establish water level elevation monitoring stations. (2) Calibrate elevations and duration of water control on the upstream Refuge area with water release rates to prevent flooding on the cropland downstream along 158 Canal. (3) Improve downstream cropland protection from flooding by changing field ditch spacing, land grading and shaping, installing “Flap” gates on field culverts, and changing farm management strategy.

Location & Project Map

Newland Township



Source

County, CAT, and Weston & Sampson

Scoping Questions

- What locations are appropriate for water level elevation monitoring stations?
- Will this task require assistance from an outside contractor?

Hazards Addressed

- ☑ Flooding
- ☐ Other
- ☐ All Hazards

Supporting Function

Conservation, General Resiliency

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☑ Infrastructure/Facility Retrofit
- ☐ Other

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

Pasquotank County Utilities Department

Potential Partners

- Outside Consultant
- Agricultural Community

Existing Funding

None identified

Potential Funding Sources

- FEMA Building Resilient Infrastructure and Communities Program (BRIC)
- Natural Resources Conservation Service

Estimated Cost

Low *(<$50k - $100k)* | Medium *($100k - $500k)* | High *($500k or greater)*

Anticipated Benefit

Low | Medium | High

Newland Township is a frequently flooded region that depends heavily on agriculture and has experienced crop loss in the past. This would mitigate flooding of the immediate area and prevent loss of cropland. The Newland Dike Ditch was also identified as highly vulnerable during the vulnerability assessment.

Priority Rating

Low | Medium | High

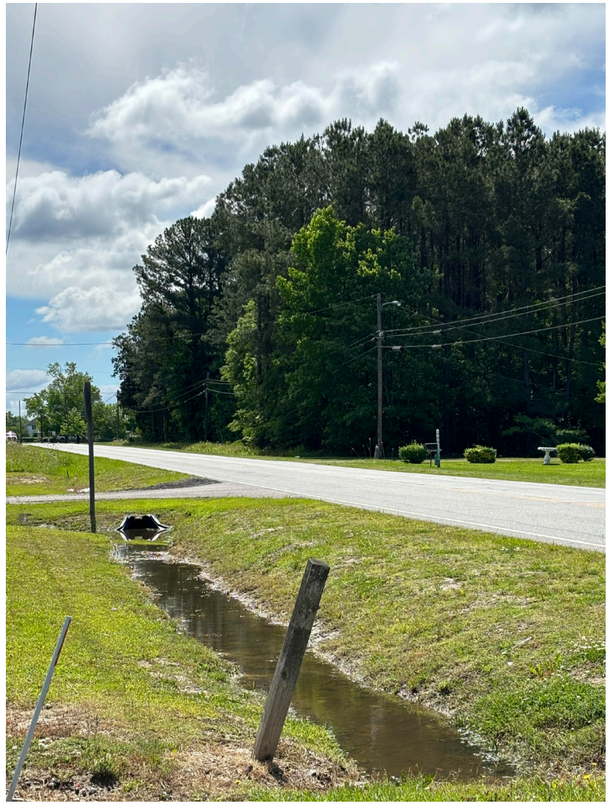
Pursue funding for culvert replacement of older or failing culverts.

Project Description

New culvert designs should be upsized and include solutions that promote wildlife passage and corridors, streamflow, and streambank health and stabilization. For example, bridges or wider culverts in lieu of tightly-sized features allow for debris to pass through and for fish to swim.

Location

County-wide, focus on Newland Township



Source

County, CAT, and Weston & Sampson

Scoping Questions

- Have culverts been inventoried and mapped in the county? Are there known culverts in Newland Township that are undersized or in need of replacement?
- Is there a database that lists the age and size of culverts across the county?
- How will culverts be prioritized for replacement?

Hazards Addressed

- ☑ Flooding
- ☐ Other
- ☐ All Hazards

Supporting Function

Stormwater management, flood mitigation

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☑ Infrastructure/Facility Retrofit
- ☐ Other

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

Pasquotank County Utilities Department

Potential Partners

Private property owners

Existing Funding

None identified

Potential Funding Sources

- FEMA Building Resilient Infrastructure and Communities Program (BRIC)
- Stormwater Funding Program through NCDEQ
- Flood Mitigation Grants through North Carolina Department of Public Safety (NCDPS)
- NCDOT / FHWA funding

Estimated Cost

Low (*<$50k - $100k*) | Medium (*$100k - $500k*) | High (*$500k or greater*)

Anticipated Benefit

Low | Medium | High

This would mitigate flooding in problem areas in Newland Township.

Priority Rating

Low | Medium | High

Residents suggested culvert replacement during community engagement as being a top concern.

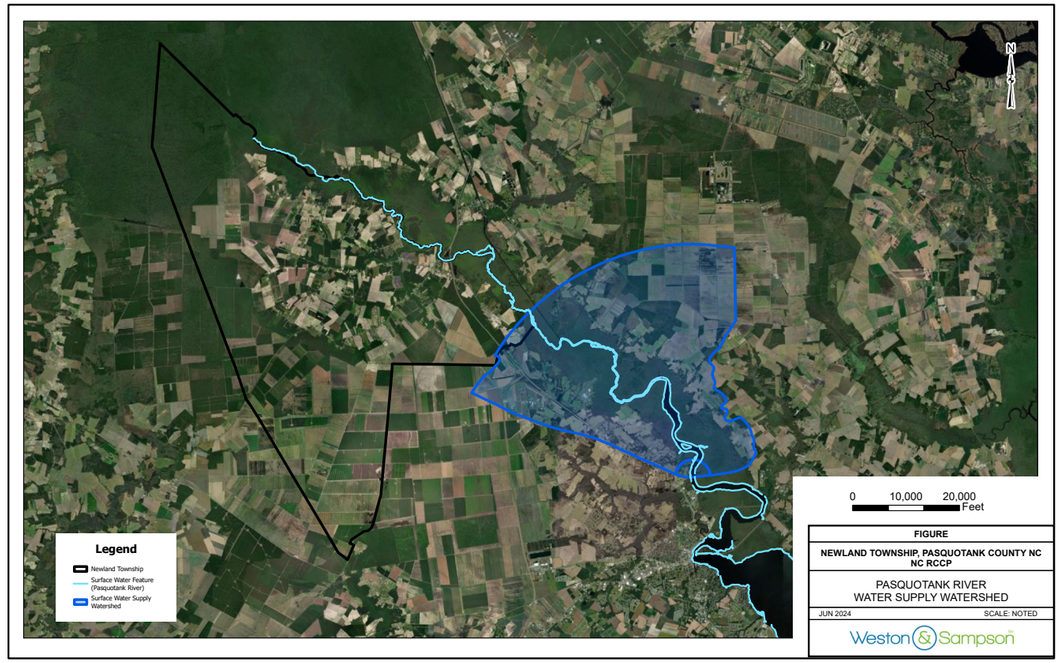
Pursue NFWF funding to develop a regional watershed hydraulic and hydrologic model.

Project Description

This model would help to better understand upstream and downstream impacts. The model would help identify solutions in the surrounding areas to reduce flood impacts in the township.

Location & Project Map

County-wide, focus on Newland Township



Source

County, CAT, and Weston & Sampson

Scoping Questions

- What design storms will be run through the model? What historic storm can be used to calibrate the model?
- What are the best statewide, regional, or local datasets available for precipitation data?

Hazards Addressed

- ☑ Flooding
- ☐ Other
- ☐ All Hazards

Supporting Function

Stormwater management

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☑ Infrastructure/Facility Retrofit
- ☑ Other: Modeling

Estimated Timeline

Short-term — Mid-term — Long-term

Responsible Entity

Pasquotank County Utilities Department

Potential Partners

Outside consultant with H/H modeling qualifications

Existing Funding

None identified

Potential Funding Sources

National Fish and Wildlife Foundation (NFWF)

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low — Medium — High

This model will help to identify areas where flood mitigation projects would be most beneficial in the region.

Priority Rating

Low — Medium — High

Develop a strategic maintenance plan for the stormwater system.

Project Description

Develop a stormwater maintenance plan, focusing on areas of known flooding such as drainage ditches along frequently flooded roadways.

Location

County-wide, focus on Newland Township

Source

County staff

Scoping Questions

- Are the assets that comprise the stormwater system inventoried and mapped in GIS?
- Does the county have adequate staff to do this in-house, or does the county need to hire outside services?

Hazards Addressed

- ☑ Flooding
- ☐ Other
- ☐ All Hazards

Supporting Function

Stormwater management, flood mitigation

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☑ Infrastructure/Facility Retrofit
- ☐ Other

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

Pasquotank County Utilities Department

Potential Partners

- NC DOT
- Private property owners
- Community organizations/volunteers

Existing Funding

None identified

Potential Funding Sources

- NC DOT Funding
- NCDEQ Stormwater Funding Program

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low | Medium | High

Improving regular stormwater maintenance will help mitigate flooding across the County and ensure that stormwater infrastructure is functioning properly.

Priority Rating

Low | Medium | High

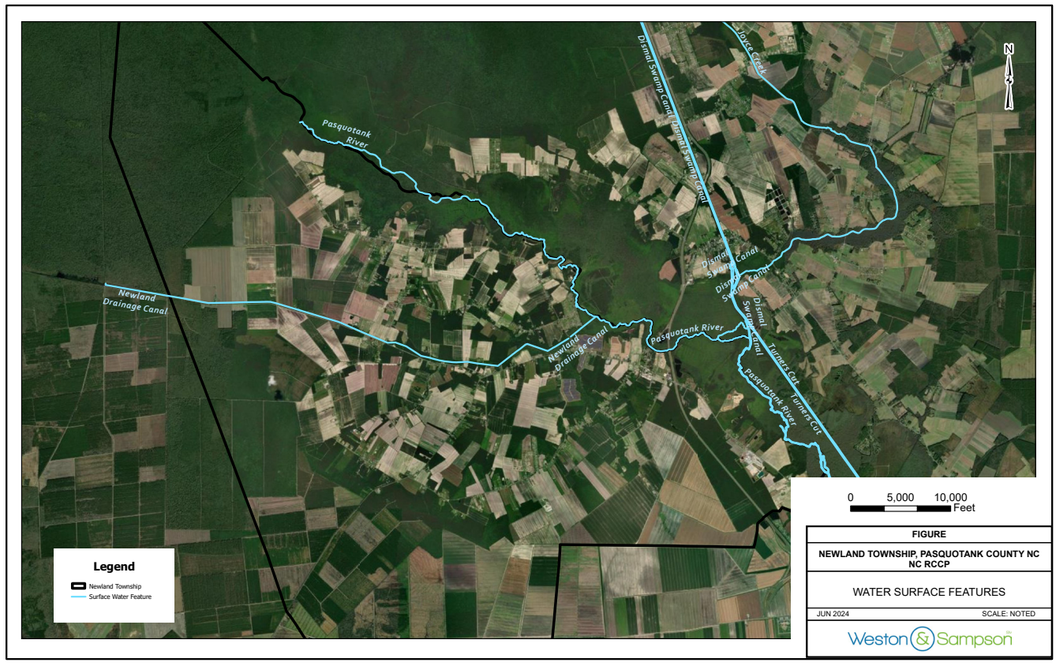
Design and implement streambank erosion controls.

Project Description

Identify local sections of stream in which debris commonly builds up and where streambanks are eroding. Develop clean-up plan and design and implement controls where erosion needs to be controlled.

Location & Project Map

Newland Township



Source

County and Weston & Sampson

Scoping Questions

- Have areas that require streambank stabilization been identified already?
- Where are the locations of volunteer lead clean-ups that were mentioned by the CAT and the community?

Hazards Addressed

- ☑ Flooding
- ☑ Other: Erosion
- ☐ All Hazards

Supporting Function

Stormwater management

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☑ Nature-based Solution **potential*
- ☑ Infrastructure/Facility Retrofit
- ☑ Other: Green Infrastructure

Estimated Timeline

Short-term — Mid-term — Long-term

Responsible Entity

Pasquotank County Utilities Department

Potential Partners

- North Carolina Department of Environmental Quality
- Community volunteers or organizations

Existing Funding

None identified

Potential Funding Sources

The Streamflow Rehabilitation Assistance Program (StRAP) through North Carolina Department of Agriculture

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low — Medium — High

Residents stated at the public workshop that streams are often filled with debris, backing up flows and creating flood issues.

Priority Rating

Low — Medium — High

Enroll in the FEMA Community Rating System (CRS).

Project Description

Implement strategies from CRS to lower National Flood Insurance Program premiums.

Location

County-wide

Source

County and Weston & Sampson

Scoping Questions

- What activities are currently being implemented in Pasquotank County that would qualify for CRS credit?
- How many active flood insurance policies are there in Pasquotank County?

Hazards Addressed

- ☑ Flooding
- ☐ Other
- ☐ All Hazards

Supporting Function

Floodplain management

Type of Solution

- ☑ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☐ Infrastructure/Facility Retrofit
- ☐ Other

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

- County Manager
- County CFM
- Shelley Cox
- Brian Parnell, Emergency Management Director

Potential Partners

- Pasquotank County Emergency Management
- Pasquotank County Utilities Department
- Pasquotank County Planning Department

Existing Funding

None identified

Potential Funding Sources

Annual budgeting process

Estimated Cost

Low *(<$50k - $100k)* | Medium *($100k - $500k)* | High *($500k or greater)*

No cost to join CRS, the cost estimate reflects staff time.

Anticipated Benefit

Low | Medium | High

This would save citizens money on their flood insurance premiums, and also support more stringent floodplain management strategies in Pasquotank County.

Priority Rating

Low | Medium | High

Pursue funding for home or utility elevations

Project Description

Pursue funding for home or utility elevations through the FEMA Hazard Mitigation Grant Program or Flood Mitigation Assistance Program.

Location

County-wide, focus on Newland Township

Source

County and Weston & Sampson

Scoping Questions

How many repetitive loss properties exist within Pasquotank County? Within Newland Township?

Hazards Addressed

- ☑ Flooding
- ☐ Other
- ☐ All Hazards

Supporting Function

Floodplain management

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☐ Infrastructure/Facility Retrofit
- ☑ Other: Structural, retrofit

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

- County Manager
- County CFM

Potential Partners

- Pasquotank County Emergency Management
- Pasquotank County Planning Department

Existing Funding

None identified

Potential Funding Sources

FEMA Hazard Mitigation Grant Program or Flood Mitigation Assistance Program

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low | Medium | High

This would protect the built environment of Pasquotank County and help protect citizens and property from flood damage.

Priority Rating

Low | Medium | High

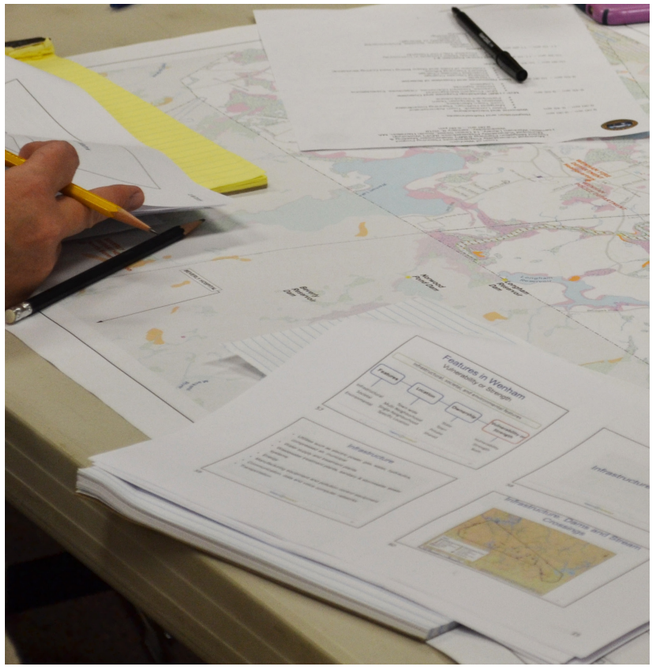
Explore interest in regional retreat/ relocation to areas with less exposure to flooding.

Project Description

Use land use regulatory mechanisms such as transfer of development rights, rolling easements, and moratoriums on new developments in high-risk areas. If residents are interested, pursue funding through FEMA for funding through the Natural Resources Conservation Service (NRCS) Emergency Watershed Protection Program for buyouts or FEMA Flood Mitigation Assistance Program.

Location

County-wide



Source

County and Weston & Sampson

Scoping Questions

- Have any residents expressed a desire to relocate?
- Are there any areas in the Township with contiguous properties that experience repetitive flooding?
- What type of enabling legislation exists for these regulatory changes?

Hazards Addressed

☑ Flooding
☐ Other
☐ All Hazards

Supporting Function

Floodplain management

Type of Solution

☑ Plans, Policies, and Ordinances
☐ Nature-based Solution
☐ Infrastructure/Facility Retrofit
☐ Other

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

- County Manager
- County CFM

Potential Partners

Pasquotank County Emergency Management

Existing Funding

None identified

Potential Funding Sources

- County annual budgeting
- FEMA Hazard Mitigation Grant Program
- FEMA Flood Mitigation Assistance Program
- Natural Resources Conservation Service Emergency Watershed Protection Program

Estimated Cost

$ Low *(<$50k - $100k)*
$ Medium *($100k - $500k)*
$ High *($500k or greater)*

Anticipated Benefit

Low | Medium | High

This would help mitigate damage both to the built environment of the County and to citizens of the County, however it would involve residents relocating which can be disruptive to their everyday lives.

Priority Rating

Low | Medium | High

Adopt design guidelines to encourage or require design considerations for flooding.

Project Description

Design guidelines could include recommendations to build to a more protective design flood elevation standard, use of flood resistant materials, and site strategies to mitigate stormwater impacts.

Location

County-wide

Source

County and Weston & Sampson

Scoping Question

What guidelines related to floodplain construction are in place for the county, region, or state?

Hazards Addressed

- ☑ Flooding
- ☐ Other
- ☐ All Hazards

Supporting Function

Floodplain management

Type of Solution

- ☑ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☐ Infrastructure/Facility Retrofit
- ☐ Other

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

Pasquotank County Planning Department

Potential Partners

Pasquotank County Inspections Department

Existing Funding

Staff time

Potential Funding Sources

County annual budgeting

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low | Medium | High

This will increase the resiliency of the built environment in Pasquotank County and help protect people and property from flooding in Newland Township (for new builds or retrofits)

Priority Rating

Low | Medium | High

Conduct assessment to identify areas of Newland Township that may become isolate during an event.

Project Description

Isolation can occur due to washed out roads or lack of access by emergency vehicle. An assessment would help identify these areas and prioritize flood mitigation activities to reduce roadway closures. Actions could include culvert replacement, drainage ditch rehabilitation and clean out.

Location

Newland Township

Photo Credit: Pasquotank-Camden EMS

Source

County and Weston & Sampson

Scoping Questions

- What isolation events have occurred in the past?
- Are there areas in Newland Township that are known to become isolated?

Hazards Addressed

- ☐ Flooding
- ☐ Other
- ☑ All Hazards

Supporting Function

Emergency response

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☐ Infrastructure/Facility Retrofit
- ☑ Other: Assessment/ Study

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

Pasquotank County Emergency Management

Potential Partners

- Pasquotank County Police and Fire
- Pasquotank County Utilities
- NC DOT

Existing Funding

None identified

Potential Funding Sources

County annual budgeting

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low | Medium | High

This will improve emergency response to Newland Township and increase public safety.

Priority Rating

Low | Medium | High

Bury powerlines.

Project Description

Bury powerlines that are susceptible to damage or outages from wind.

Location

County-wide

Source

County and Weston & Sampson

Scoping Questions

- Are powerlines mapped by the utility department or provider?
- Are there any areas of the county where underground powerlines would not be feasible?

Hazards Addressed

- ☐ Flooding
- ☐ Other
- ☑ All Hazards

Supporting Function

Energy, power supply

Type of Solution

- ☐ Plans, Policies, and Ordinances
- ☐ Nature-based Solution
- ☑ Infrastructure/Facility Retrofit
- ☐ Other

Estimated Timeline

Short-term | Mid-term | Long-term

Responsible Entity

Pasquotank County Utility Department

Potential Partners

Utility Provider

Existing Funding

None identified

Potential Funding Sources

FEMA Building Resilient Infrastructure and Communities Program (BRIC)

Estimated Cost

Low	Medium	High
(<$50k - $100k)	*($100k - $500k)*	*($500k or greater)*

Anticipated Benefit

Low | Medium | High

This would increase the overall resilience of Pasquotank County.

Priority Rating

Low | Medium | High

Appendix A

Community Action Team (CAT) Meeting Materials

CAT Meeting 1 – September 20, 2023

PASQUOTANK COUNTY

NORTH CAROLINA RESILIENT COASTAL COMMUNITIES PROGRAM

Meet & Greet | Project Kick-off

September 20, 2023

Pasquotank County·NC

Weston & Sampson℠ | Berkley Group

Agenda

1. TEAM INTRODUCTIONS
2. ABOUT THE RCCP PROGRAM
3. REVIEW OF SCOPE & SCHEDULE
4. REVIEW OF DATA REVIEWED & NEEDED
5. DISCUSSION ON COMMUNITY ACTION TEAM
6. COMMUNITY ENGAGEMENT EXAMPLES

Consultant Team Member Introductions

Bella Tisel
Project Manager

Chip Hutchens
Team Leader

Jeannie Lewis
Technical Review

Anna Kimelbatt
Resiliency Planner

Erin Herock
Resiliency Planner

Michael Zehner
Director of Planning & Community Development

Kate Jones
Principal Planner

The Resilient Coastal Communities Program (RCCP)

- The RCCP is a state-local partnership designed to help overcome barriers in coastal resilience and adaptation planning, boost local government capacity, and support a proactive, sustainable, and equitable approach to coastal resilience planning and project implementation.
- **Weston & Sampson** has been hired as the technical consultant to complete **Phases 1 and 2** of RCCP for Elizabeth City and Pasquotank County.

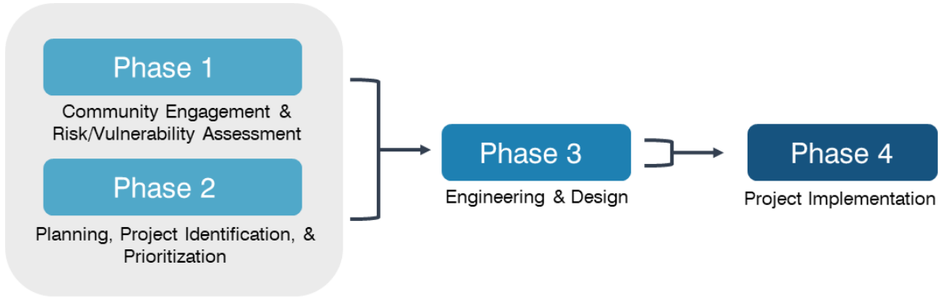
Program Objectives

Address	Assist	Help	Advance	Link
Address barriers to coastal resilience at the local level	Assist communities with risk & vulnerability assessments	Help communities develop a portfolio of well-planned and prioritized projects	Advance priority projects to "shovel-ready" status	Link communities to funding streams for project implementation

The Resilient Coastal Communities Program (RCCP)

Program Scope

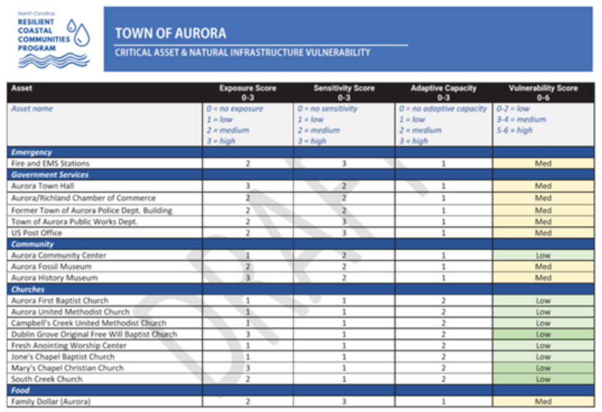
- All counties and municipalities within the CAMA jurisdiction are eligible to apply for the RCCP
- Once communities complete Phases 1 & 2, they become eligible to apply for additional funding via Phase 3 and Phase 4.

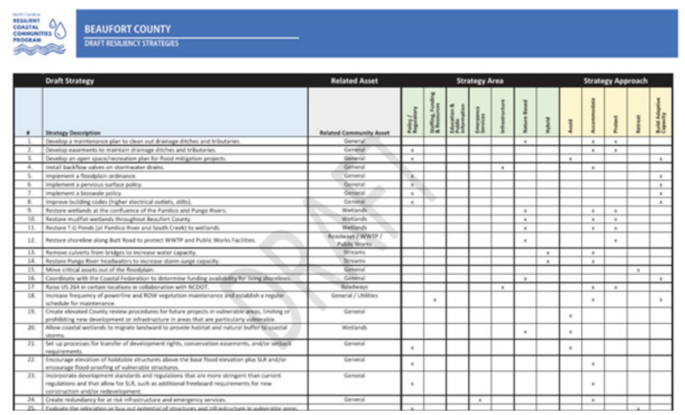


The Resilient Coastal Communities Program (RCCP)

Phase 1 & 2 Objectives

- Perform a data- and community-driven risk and vulnerability assessment
- Develop a portfolio of well-planned and prioritized solutions to address risks





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Overview of Tasks

PHASE 1

STEP 1 – DEVELOP A COMMUNITY ACTION TEAM (CAT)
Purpose: Create a team made up of key stakeholders and appoint a champion of the group
Deliverables: CAT with at least 5 members, appointed "CAT Champion"

STEP 2 – REVIEW EXISTING PLANS AND REPORTS
Purpose: Conduct a review of existing plans and reports to identify what the community has already done
Deliverables: Review on critical assets, sea level rise projections, risk assessments, and resilience-related projects

STEP 3 – SET VISION AND GOALS
Purpose: Develop a community-specific vision and set of goals
Deliverables: Community vision statement

STEP 4 – DEVELOP A COMMUNITY ENGAGEMENT STRATEGY
Purpose: Develop a community engagement strategy that identifies and engages with stakeholders
Deliverables: Outlined community engagement strategy and notes from two community workshops/events

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Overview of Tasks

PHASE 1

STEP 5 – IDENTIFY AND MAP CRITICAL ASSETS, NATURAL INFRASTRUCTURE, AND SOCIALLY VULNERABLE POPULATIONS
Purpose: Map the required minimum critical assets and relevant natural infrastructure within the community
Deliverables: Using ArcGIS to create maps of assets, areas of social vulnerability, and natural infrastructure

STEP 6a – IDENTIFY AND MAP HAZARDS
Purpose: Identify and map current and future hazards, assess vulnerability of community assets, and review hazard mitigation risk assessment
Deliverables: Identify and map hazards overlayed with community assets identified

STEP 6b – ASSESS VULNERABILITY
Purpose: Evaluate the extent to which a community's assets are vulnerable
Deliverables: Review on critical assets, sea level rise projections, risk assessments, and resilience-related projects

STEP 6c – ESTIMATE RISK
Purpose: Estimate the risk to community assets to determine where there is an acceptable level or risk
Deliverables: Gather supplemental data past the HMP, estimate risk of assets using sample table

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Overview of Tasks

PHASE 2

STEP 1 – IDENTIFY A SUITE OF POTENTIAL SOLUTIONS
Purpose: Work with the CAT and community members to identify, plan, and prioritize a combination of actions
Deliverables: Portfolio of resilience projects

STEP 2 – CONSOLIDATE AND PRIORITIZE PROJECTS
Purpose: Evaluate and prioritize actions by hosting an open house or other public forum to allow for feedback and review
Deliverables: Public input on projects, develop a project portfolio that identifies at least one being nature-based

FINAL RESILIENCY STRATEGY (REPORT)

VULNERABILITY ASSESSMENT REPORT
quantitative risk and vulnerability assessment that evaluates the vulnerability of the community's population and critical community assets and summarizes relevant information from previous steps

PROJECT PORTFOLIO
a portfolio of options aimed at reducing exposure and sensitivity or increasing adaptive capacity to flooding and other hazards based on public input and CAT evaluation

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Project Schedule

NC RCCP Phase 1 & 2 Timeline

Phase / Step	Task	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Project Management and Coordination												
1.0	**Kick off meeting and MOU**											
	Hold a kick off meeting with client.											
	Develop and sign a MOU											
1.1	**Develop a CAT**											
	Develop a CAT with at least 5 members.											
	Identify gaps in expertise and fill these.											
	Appoint a "CAT Champion"											
	Summarize the process for developing this CAT.											
	Monthly meetings with the CAT (no set amount required)											
Existing Conditions Review and Analysis												
1.2	**Review Existing Plans & Efforts**											
	Review and list resources on assets, SLR, risk, and resilience.											
	Identify and fill data and information gaps.											
	Identify and list any data/knowledge gaps.											
1.3	**Set Vision and Goals**											
	Develop a community resilience vision statement											
	Create a list of locally driven goals for effort.											
1.4	**Develop an Engagement Strategy**											
	Develop a stakeholder engagement strategy.											
	Develop an approach for vulnerable and underrepresented members.											

Project Schedule

Phase / Step	Task	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Vulnerability Assessment												
1.5	**Identify and Map Assets, Infrastructure, Populations**											
	Map critical assets											
	Map areas of social vulnerability											
	Map natural infrastructure											
1.6a	**Identify and Map Hazards**											
	Review local/regional HMP's and extra data, and identify gaps to fill											
	Identify hazards and stressors to include in risk and vulnerability assessment											
	Map geographic extent of hazards and overlay with community assets											
1.6b	**Assess Vulnerability**											
	Define thresholds and criteria for vulnerability											
	Estimate cumulative vulnerability using vulnerability index											
1.6c	**Estimate Risk**											
	Gather supplemental data past what the HMP provides.											
	Estimate the risk of critical assets identified.											
2.1	**Identify a Suite of Potential Problems**											
	Develop a portfolio of resilience projects (must include one nature-based solution).											
2.2	**Consolidate and Prioritize Projects**											
	Solicit public input and evaluate projects with the CAT.											
	Develop a Project Portfolio that identfies at least 5 priority projects.											
2.3	**Create a Resilience Strategy**											

Data Reviewed

We have begun reviewing existing local and regional efforts for both Elizabeth City and Pasquotank County.

This includes:

- County and city ordinances
- State climate planning documents
- Regional Vulnerability and Risk Assessment
- Land use plans
- Flood mitigation plans

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What else should we include?

Scope	Document
State (North Carolina)	• NC Climate Risk Assessment and Resilience Plan • NC Flood Risk Information System • NC Flood Damage Prevention Ordinance
Regional	• Regional Hazard Mitigation Plan • Vulnerability and Risk Assessment (Elizabeth City, Pasquotank County, and Camden County)
County (Pasquotank)	• Code of Ordinances (& Chapter 152 – Flood Damage Prevention) • Subdivision Ordinance • Water & Sewer Comprehensive Evaluation and Master Plan • Land Use Plan (DRAFT) • Stormwater Design Manual • Advanced Core Land Use Plan (2004)
County/City (Pasquotank/Elizabeth City)	• Parks and Recreation Comprehensive Master Plan 2016-2026 • Tourism Development Authority Strategic Plan

Community Action Team (CAT)

Who should participate in this?

- The CAT should be made up of key stakeholders who provide targeted input and champion the effort.
- Existing community organizations/boards to consider:

ECSU
ELIZABETH CITY STATE UNIVERSITY
FOUNDED 1891

- Community Leaders
- Technical or Planning Committees from Other Processes

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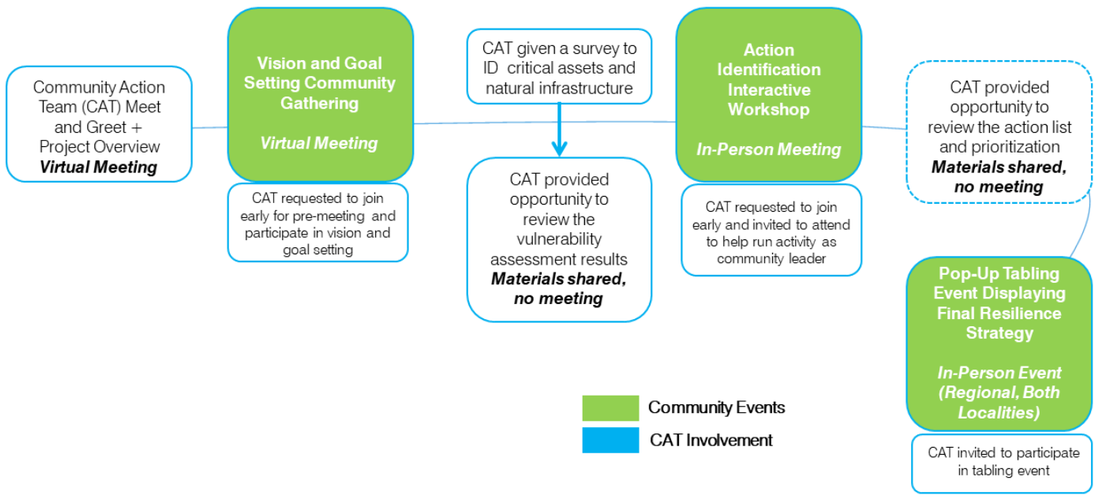
Initial Engagement Plan



Community Engagement Examples

- Open House Events
- Site Walks
- Interactive Workshops
- "High-touch" Engagement
- Equitable Engagement Modifiers

Workshops
Presentations, breakout groups, interactive activities

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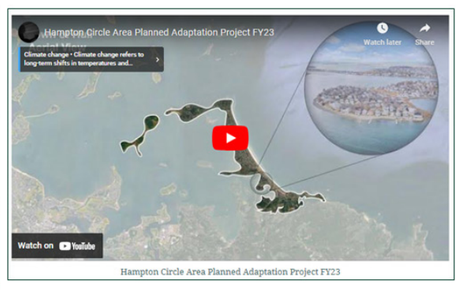
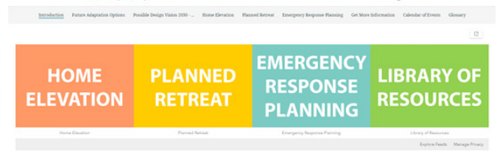
Community Engagement Examples

Flyers and Promotional Materials
(translation if needed)



Educational Videos

Social Media Posts



Webpages and ArcGIS Storymaps

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CAT Meeting 2 – October 30, 2023

North Carolina
RESILIENT
COASTAL
COMMUNITIES
PROGRAM

PASQUOTANK
COUNTY·NC

PASQUOTANK COUNTY

North Carolina Resilient Coastal Communities Program

Community Meeting

October 30, 2023

Weston & Sampson

Berkley Group

You can either use the QR Code to fill out your Vision Statement or stop by the poster-station and fill out a note card.

Thank you!

We look forward to your involvement.

The Resilient Coastal Communities Program (RCCP)

The RCCP is a state-local partnership designed to assist communities become **more resilient** by providing funding for professional assistance to evaluate **local risk and vulnerabilities.**

Address	Assist	Help	Advance	Link
Address barriers to coastal resilience at the local level	Assist communities with risk & vulnerability assessments	Help communities develop a portfolio of well-planned and prioritized projects	Advance priority projects to "shovel-ready" status	Link communities to funding streams for project implementation

What is Climate Resilience?

Adaptation

Adapting to life in a changing climate – involves adjusting to actual or expected future climate

Vulnerability

The degree to which a system is susceptible to adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of exposure, sensitivity, and adaptive capacity.

Resilience

The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner.

What will be included in this process?

Risk Assessment

Community Engagement

Portfolio of projects to address flooding

Weston & Sampson | Berkley Group

Project Schedule

Weston & Sampson | Berkley Group

How can you be involved?

1. Contribute your ideas about **Vision and Goals** tonight!
2. Attend a workshop to **help develop actions for the resilience plan** in the Spring!
3. Stop by a **tabling event to see the final Resilience Plan** next Fall
4. **Check out updates** about the Resilience Plan on **the County website**

What is your Vision for a Climate-Resilient Pasquotank County?

Fill out a card letting the County know your vision to enter a raffle **to win a $300 grocery store gift card for Food Lion.**

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Example Vision Statements

We envision… our county government, residents, and businesses will be prepared during rainstorms, riverine flooding, and coastal storms events to reduce damages to property and injury or loss of life.

Natural areas and green space will help mitigate the impacts of heat and flooding while also providing beautiful space for recreation, farming, and local wildlife.

Our community will connect with one another and help one another during hard times.

How to make your Vision Statement - Tips

We envision Pasquotank County as a place that _____.

In the future, our community will be_____.

To reduce the impacts of climate hazards, the County will _____.

Appendix B

Critical Assets Vulnerability Assessment Scores

Table 11. Critical Assets Vulnerability Assessment Scores

Asset Name	Asset Type	Value Type	E	S	A	V	Vulnerability Score
Utility Substation	Utility Substation	Infrastructure/Utilities	3	3	0	6	**HIGH Vulnerability**
Pasquotank Newland Volunteer Fire Department	Fire Station	Government Services	1	4	0	5	**HIGH Vulnerability**
Newland Dike Ditch	Dike Ditch	Infrastructure/Utilities	2	3	0	5	**HIGH Vulnerability**
Bethel AME Zion Church	Church	Community	3	2	1	4	**MODERATE Vulnerability**
Mount Carmel Missionary Baptist Church	Church	Community	3	2	1	4	**MODERATE Vulnerability**
Newland United Methodist Church	Church	Community	3	2	1	4	**MODERATE Vulnerability**
Duck Thru/ Shell	Fuel Station	Local Businesses / Other	0	4	0	4	**MODERATE Vulnerability**
Newland Ruritan Building	Community Center	Community	1	3	0	4	**MODERATE Vulnerability**
Solid Waste Convenience Site	Solid Waste Site	Government Services	0	4	0	4	**MODERATE Vulnerability**
North Carolina Coastal Land Trust Easement - Northside Road	Managed Areas	Natural Resources	3	2	1	4	**MODERATE Vulnerability**
Family Dollar	Grocery	Local Businesses / Other	0	4	1	3	**LOW Vulnerability**
Dollar General	Grocery	Local Businesses / Other	0	4	1	3	**LOW Vulnerability**
Jones Lumber Company	Major Employer	Local Businesses / Other	0	3	0	3	**LOW Vulnerability**
Great Dismal Swamp National Wildlife Refuge and Vicinity	National Heritage Natural Area	Natural Resources	2	1	0	3	**LOW Vulnerability**
Ramoth Gilead Baptist Church	Church	Community	1	2	1	2	**LOW Vulnerability**
Cell Tower	Cell Tower	Infrastructure/Utilities	0	2	0	2	**LOW Vulnerability**
Pasquotank County Open Space - Palmer Road	Managed Areas	Natural Resources	2	1	1	2	**LOW Vulnerability**
North Carolina Coastal Land Trust Easement - US Highway 158, Turnpike Road, Lynchs Corner Road	Managed Areas	Natural Resources	2	1	1	2	**LOW Vulnerability**
Lamb's Grove Baptist Church	Church	Community	0	2	1	1	**LOW Vulnerability**
NC Division of Mitigation Services Easement	Managed Areas	Natural Resources	0	1	0	1	**LOW Vulnerability**
Pasquotank County Open Space - HWY 158	Managed Areas	Natural Resources	0	1	1	0	**LOW Vulnerability**
North Carolina Coastal Land Trust Easement - US Highway 158	Managed Areas	Natural Resources	0	1	1	0	**LOW Vulnerability**

E = Exposure Score **S = Sensitivity Score** **A = Adapative Capacity Score** **V = Vulnerability Score**

Appendix C

Detailed Maps

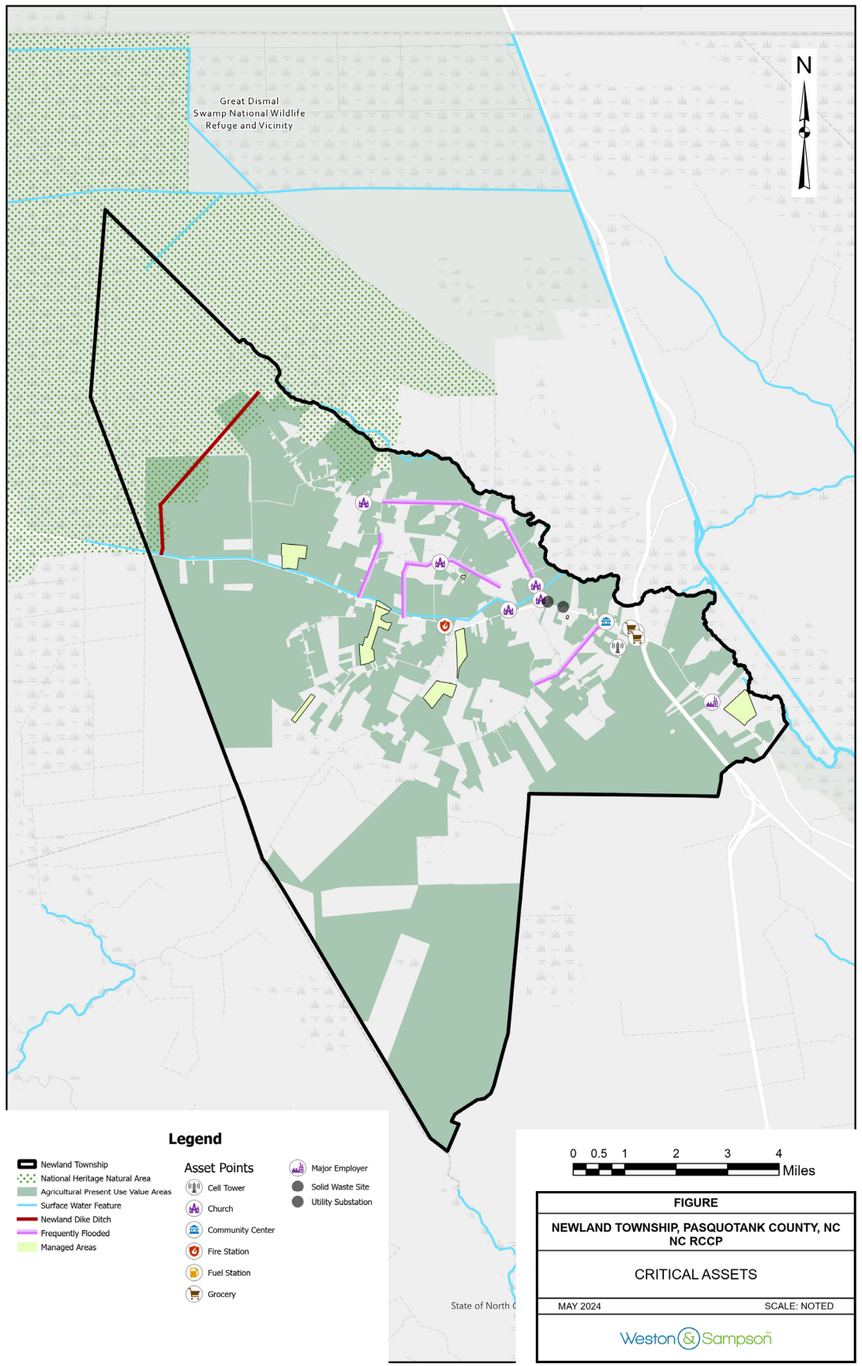

Figure 1. Critical Assets

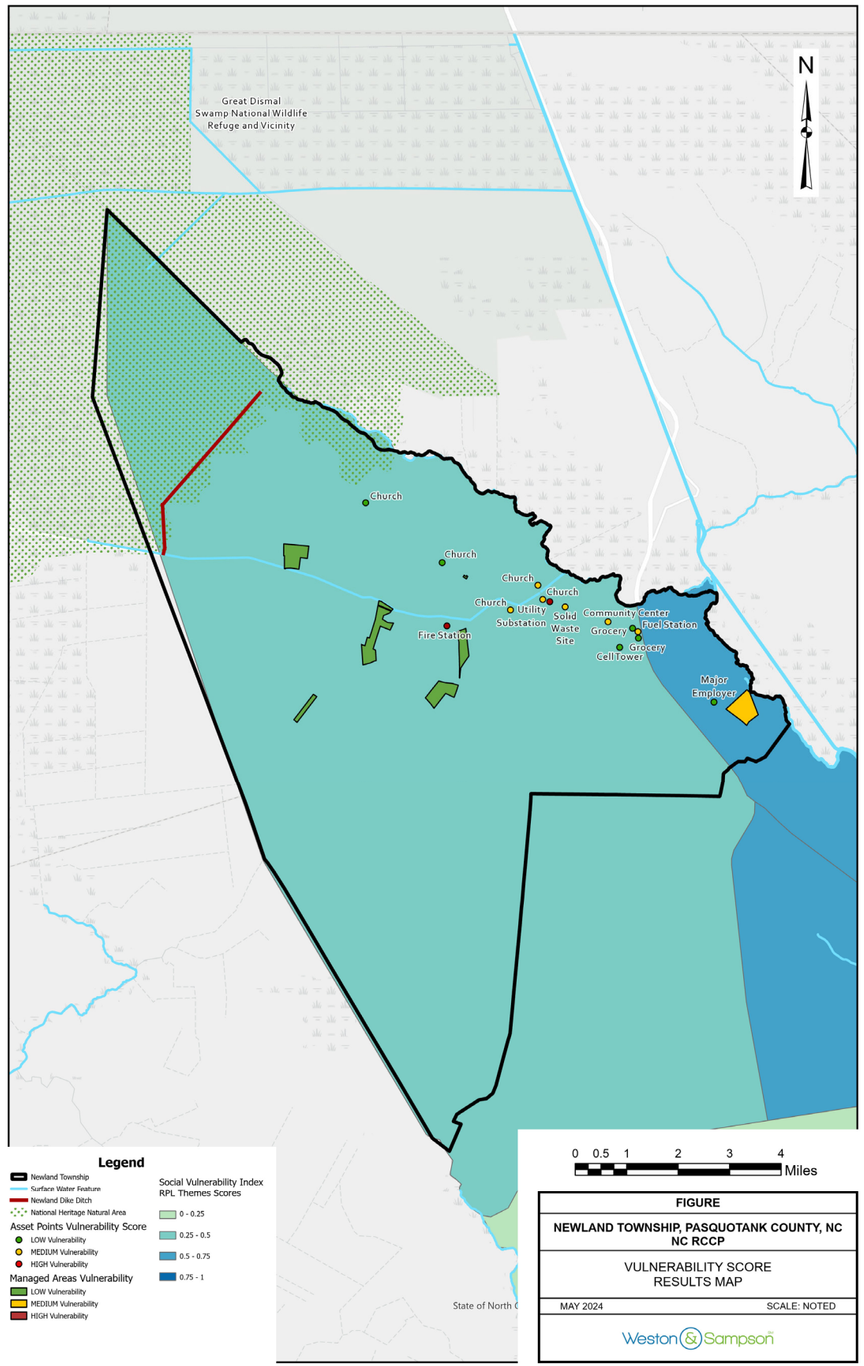

Figure 2. Social Vulnerability Map RPL Themes Scores

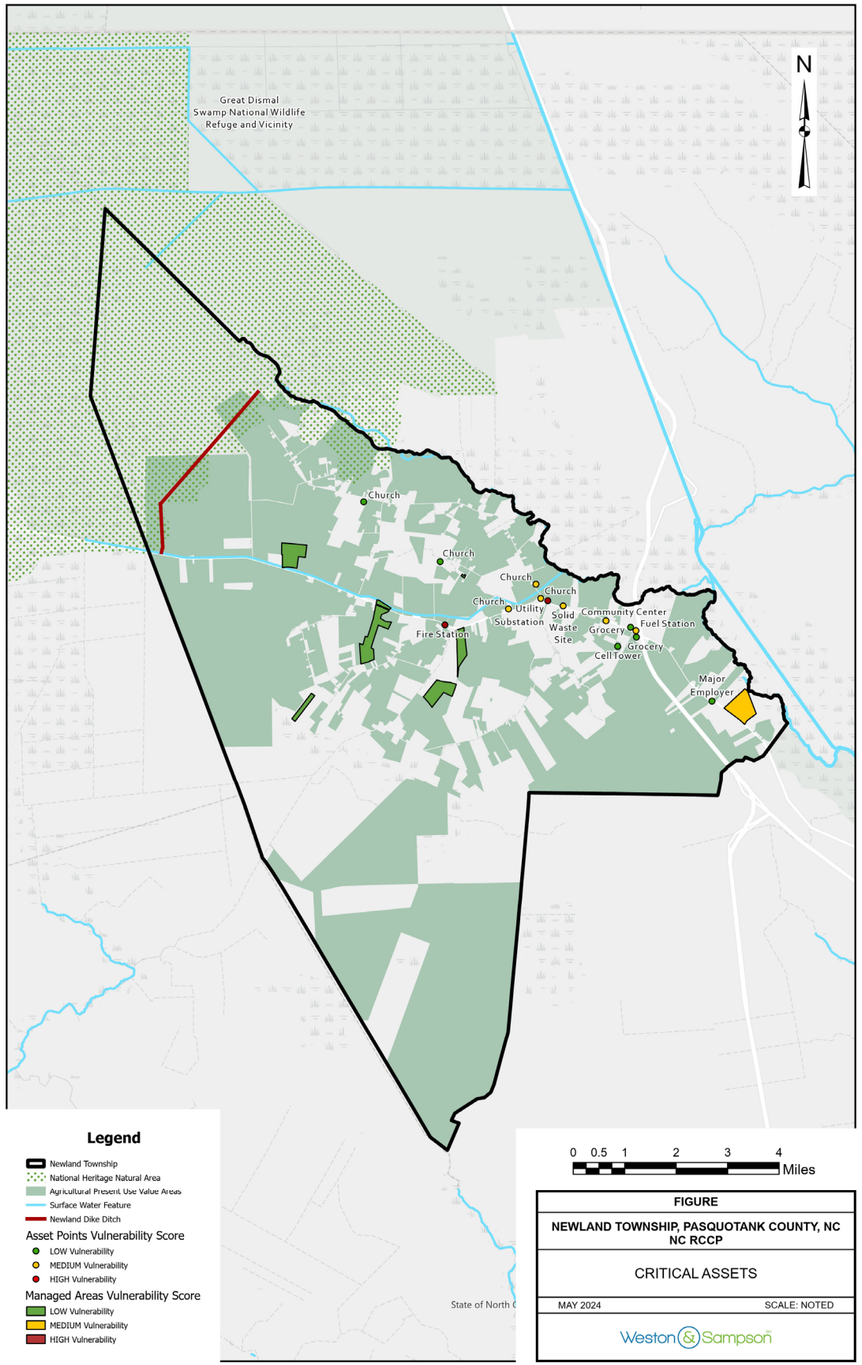

Figure 3. Vulnerability Score Results Map

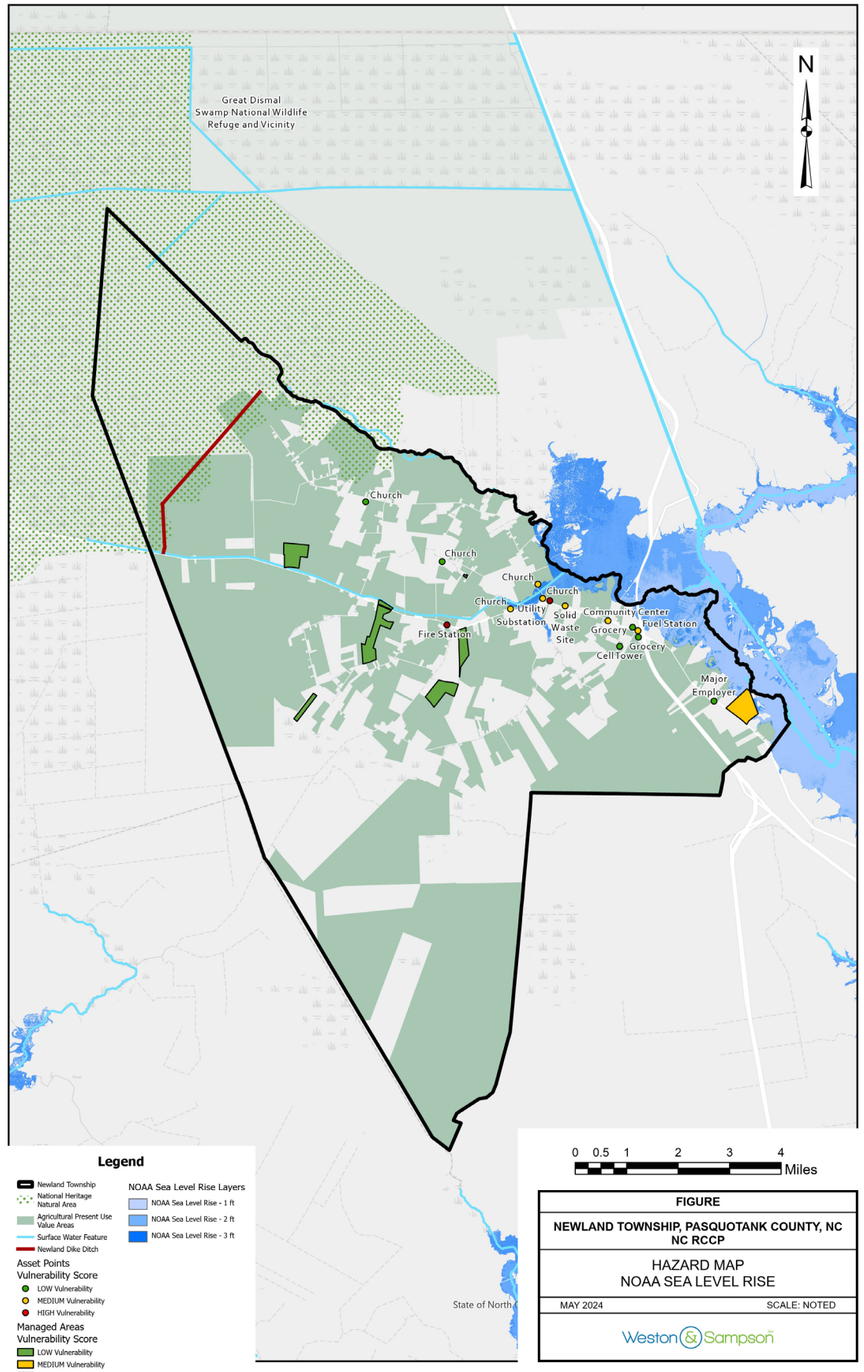

Figure 4. Hazard Map - NOAA Sea Level Rise

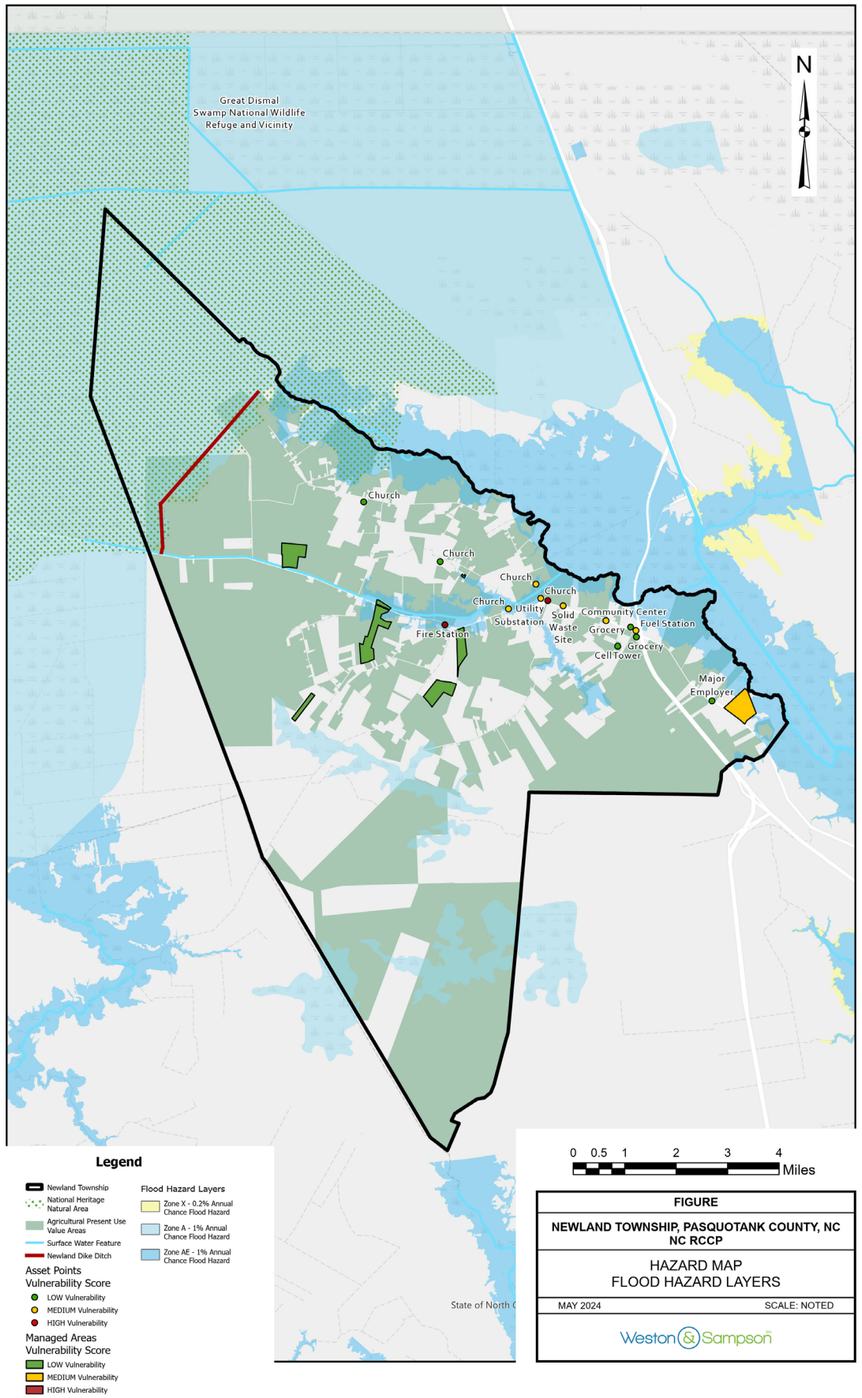

Figure 6. Hazard Map - FEMA Flood Hazards Layer

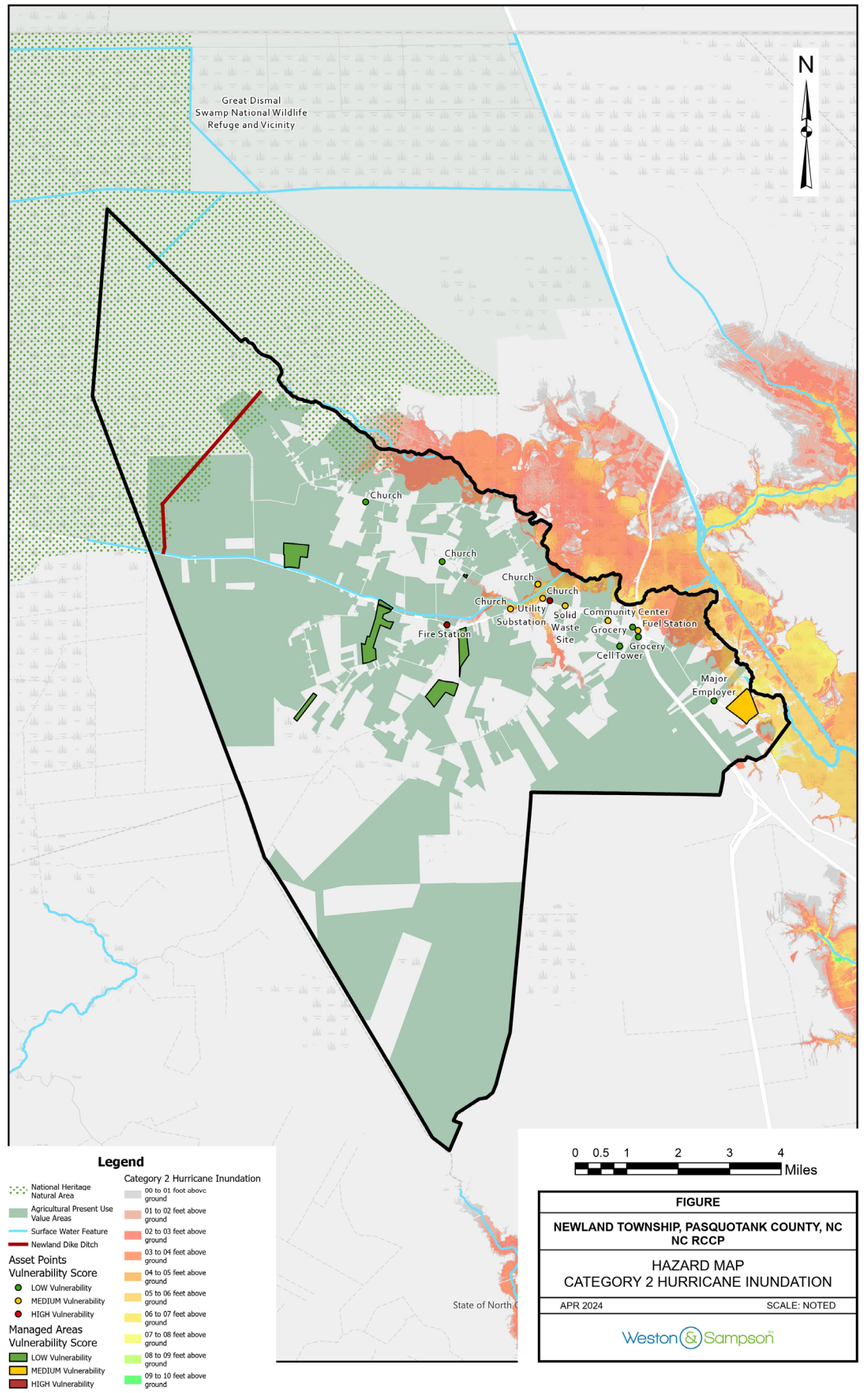

Figure 7. Hazard Map - Category 2 Hurricane Inundation

Appendix D

CAT Correspondence Log

Correspondence with the Community Action Team (CAT)

Date	Communication
September 20, 2023	CAT RCCP Kick-off Meeting
October 30, 2023	CAT invited to participate in public Vision and Goals Presentation/ Open House in Newland Township
November 2023	Vision and Goals Survey shared with CAT
March 12, 2024	Shared critical asset dataset with CAT for review, and CAT provided additions
March 18, 2024	Provided risk and vulnerability assessment for CAT review
May 15, 2024	Invited CAT to participate in a public open house on strategies and actions
June 20, 2024	Shared final Resilience Strategy with CAT for review