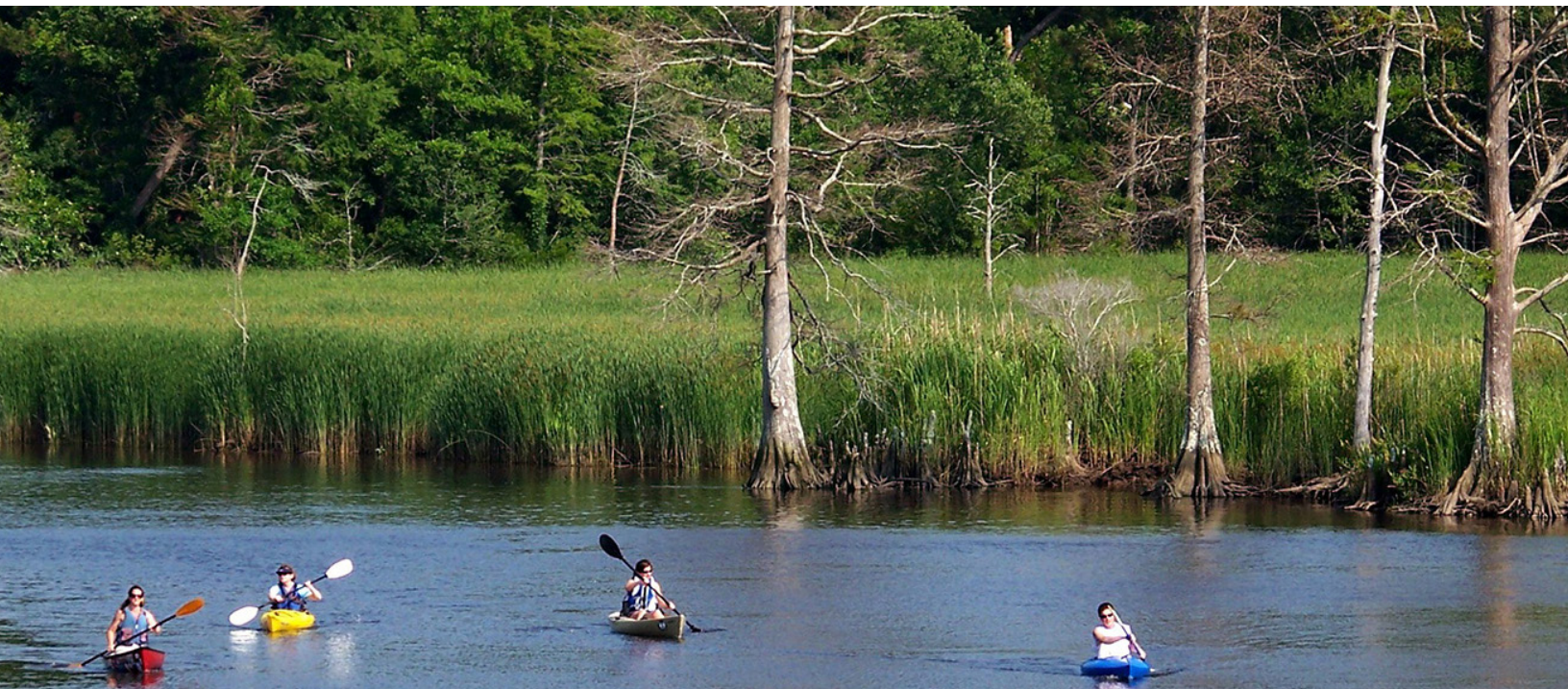


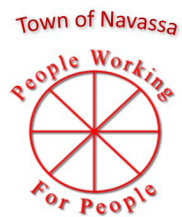


NAVASSA
RESILIENT COASTAL
COMMUNITIES PROGRAM

Resilience Strategy | January 2022



PREPARED FOR
THE TOWN OF NAVASSA



FUNDED BY
N.C. DIVISION OF COASTAL MANAGEMENT



PREPARED BY
CONSULTANT





Town of Navassa Resilience Strategy

1.0 Summary

In March 2021, the Town of Navassa was selected to participate in Phase 1 and 2 of the North Carolina Resilient Coastal Communities Program (RCCP), administered by the North Carolina Division of Coastal Management. The Program is a federal-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. Since March 2021, Moffat & Nichol (M&N), in partnership with the Town of Navassa, has reviewed existing plans and resources, conducted three Community Action Team meetings, and obtained public feedback through a public survey and a public meeting to develop a Resilience Strategy. The Resilience Strategy, as described further in this report, includes a Risk & Vulnerability Assessment and a Project Portfolio to help the Town identify solutions to reducing exposure, sensitivity, and increase adaptability to flooding and other hazards. Phase 1 and 2 of the Program were completed in January 2022. Following completion of Phase 1 and 2, the Town will be eligible for Engineering, Design, and Implementation funding through the Program's future phases, anticipated to be available in Spring 2022. The Town will continue to seek feedback from residents and stakeholders on priorities and implementation opportunities.

This report discusses the various components of the Town of Navassa's Resiliency Strategy. It consists of the following seven subsections:

- 1.1 Vision & Goals
- 1.2 Community Action Team
- 1.3 Community Engagement Strategy
- 1.4 Review of Existing Local and Regional Efforts
- 1.5 Risk and Vulnerability Assessment Report
- 1.6 Project Portfolio
- 1.7 Additional Files

1.1 Vision & Goals

The Town of Navassa, M&N, and the Community Action Team (CAT) worked together to develop a community-specific vision and set of goals which established the local context for the RCCP program and guide subsequent steps. The community vision and goals drew from existing sources of information, such as:

- Previously identified goals or vision statements developed by the community as part of other planning or budget processes; or
- Natural hazard events such as hurricanes, or trends such as increased flooding frequency; or
- Community demographics such as particularly vulnerable or disadvantaged populations.



The **vision** is intended to be an aspirational statement for where the Town wants to be in the future, particularly in relation to coastal hazards.

The **goals** are intended to be specific, measurable goals to help the community identify steps that can be taken to achieve the vision. The goals could relate to preparedness, recovery, community engagement, construction, and restoration, etc. The community goals reflect the triple-bottom line approach to resilience, which goes beyond traditional hazard mitigation and disaster recovery to develop a holistic strategy considering social, environmental, and economic factors.

1.1.1 Vision Statement

The approved Town of Navassa RCCP Vision statement is, “To create a more resilient community where residents can live in safety, educated about flood risk, while protecting the cultural heritage and identity of the community, particularly with regard to stormwater management, displacement of residents during disaster events, development and population growth, watershed planning, climate change, floodplain management, community planning, education and outreach, and conservation and restoration.”

1.1.2 Goal Statements

The approved Town of Navassa RCCP Goal Themes and Statements are:

1. **Stormwater.** Identify and implement stormwater management and drainage improvements, particularly in highly vulnerable areas
2. **Displacement.** Evaluate and address concerns related to displacement, including temporary housing issues, permanent replacement housing issues, and other housing and small business concerns.
3. **Development and Growth.** Better address development pressures and population growth/change, both now and for the future of the community.
4. **Watershed.** Improve watershed runoff, clear temporary obstructions, and address unprotected sections.
5. **Climate Change.** Update local data, mapping, and information to better address today’s risk-based conditions as well as potential future conditions related to climate change and sea level rise concerns.
6. **Community Rating System (CRS).** Join the Community Rating System (CRS) under the National Flood Insurance Program (NFIP) and maintain and improve that participation over time.

The vision and goals are listed in further detail in *Appendix A: Vision and Goals*.

1.2 Community Action Team

To begin the Risk & Vulnerability component of Phase I, the Town of Navassa created a Community Action Team (CAT) of key stakeholders to provide targeted input and champion the effort. Building relationships, trust, and shared understanding among key stakeholders set the foundation for implementing resilience action. The CAT was developed by the Town, with guidance and support from M&N. In keeping with the RCCP Planning Handbook, issued by the NC Division of Coastal Management, the CAT members were selected based on their expertise in planning and community development, hazard mitigation, utility management, engineering, the community’s economy, engaging with vulnerable and underrepresented populations, and familiarity with nature-based solutions. Members stem from



roles such as municipal/county managers, planners, elected officials, utility managers, community and economic developers, business community representatives, disaster recovery coalitions/groups, councils of government (COGs), state and federal land managers, non-governmental organizations (NGOs), private organizations, and other roles which work with the community on resilience planning.

The CAT was intended to be comprised of a diverse group of at least five members. M&N worked directly with the Town of Navassa to develop a CAT roster. The Town chose various individuals based on their knowledge, familiarity, and ability to contribute to the RCCP.

The following members comprised the Town of Navassa RCCP Community Action Team:

Affiliation	Contact Name*
Town of Navassa	Barnes Sutton and Claudia Bray
Cape Fear Council of Governments	Sam Shore
Land Management Group	Christian Preziosi
NC Coastal Land Trust	Jesica Blake
UNC-Wilmington Department of Geology	Roger Shew
Cedar Hill West Bank Heritage Foundation	Bernard Henry Robbins
Navassa Citizen	Al Beatty
Navassa Councilman	Tony Burgess

*Contact email is listed in Appendix B: Community Action Team.

The CAT met three times over the course of Phase I and II:

- CAT Meeting #1: July 7, 2021, from 11:00 a.m. to 12:30 p.m.
- CAT Meeting #2: September 28, 2021, from 10:30 a.m. to 12:00 p.m.
- CAT Meeting #3: December 6, 2021, from 12:30 to 2:00 p.m.

All meeting minutes, presentations, and a full list of stakeholder contact information are listed in *Appendix B: Community Action Team*.

1.3 Community Engagement Strategy

To ensure participation from public stakeholders, a community engagement strategy was developed to outline a plan for engaging communities during the risk and vulnerability assessment and project planning, prioritization, and selection. The community engagement process worked towards the following:

- Promoting representation and equitable outcomes for marginalized communities and vulnerable populations;
- Building trust, relationships, and partnerships;
- Providing feedback and validation of the Risk & Vulnerability Assessment developed by the Community Action Team; and
- Assisting with prioritizing projects for Phases 3 and 4 of the Program.



A Community Engagement Strategy was developed to create a roadmap of the planning process for Phases 1 and 2 of the Navassa RCCP. The strategy presented the Team’s initial considerations, the roles and responsibilities of the various parties, the outreach process over the course of the two (2) phases, the project schedule, and the outreach tools, techniques, and strategies to be implemented by the Team. These tools, techniques and strategies included: a Community Action Team (CAT), a Risk & Vulnerability Assessment webpage, one (1) public meeting, a project information fact sheet, planning resources (available on the webpage), one (1) public participation survey, a social media campaign, and leveraging local news outlets (newspaper, press release, and printed outreach material).

As the Town of Navassa RCCP kicked off and began the process moving into Phase 1, Risk & Vulnerability Assessment, the M&N Team worked in collaboration with Barnes Sutton, Navassa Town Planner, on the various outreach components.

1.3.1 Project Website

M&N worked with Town staff to develop the website content to present information on the RCCP planning process. The Town of Navassa took the information and placed it on an existing webpage, [Watershed Management Program \(townofnavassa.org\)](https://www.townofnavassa.org), which launched on August 5, 2021. The website provides latest news, introduction and background, program sponsor, ways to stay connected, the process forward, planning resources, and available presentations and downloads developed during Phases 1 and 2. The website is intended to be updated throughout the planning process with relevant news, documents, and meeting material for public record. The webpage outline is available in *Appendix G: Additional Files*.

1.3.2 Project Information Fact Sheet

M&N developed a project fact sheet to provide basic information on the planning process, as well as project contact information and links for interested parties to engage in the planning effort. The fact sheet was made available on the project webpage and was intended for the Town of Navassa to distribute to the community through their various outreach channels. The project fact sheet is available in *Appendix G: Additional Files*.

1.3.3 Social Media Campaign

A social media campaign was created by M&N, with posts, images, and a posting schedule to accompany the various outreach efforts of the project and align with information presented on the project webpage. Although this campaign was created for the Town to use, The Town of Navassa did not share this information on their various outreach channels. As a result, others were unable to reshare the information on their respected channels for greater outreach and engagement. The social media campaign is available in *Appendix G: Additional Files*.

1.3.4 Public Survey

A public survey was created with the Town of Navassa and the CAT’s input. The goal of the survey was to obtain further information from the public to further support the RCCP work for the Town of Navassa. The survey was developed on SurveyMonkey. It was also provided as a hard copy survey for the Town of Navassa to distribute, when appropriate. The survey launched on July 19 and was open until mid-September. A total of 3 participants took the survey.

Considering the lack of participation in the survey, the responses provided were but a small sampling of community feedback. As such, flooding caused by storm surge and/or rainfall from tropical systems, flooding caused by tidal surge (king tides and/or higher than normal tides), and flooding caused by thunderstorms and intense rainfall are



residents' top concerns. Residents indicated their top planning priorities are protecting private (residential and commercial) property, protecting critical facilities (for example: doctor's offices, police stations, fire stations, etc.) and addressing socio-economic disparity in economically distressed neighborhoods and business districts. The full survey report is available in *Appendix G: Additional Files*.

1.3.5 Public Meeting

A hybrid public meeting was held on August 25 from 4:30 to 5:30 p.m. 11 attendees participated in the public meeting. The public meeting was a general presentation and discussion providing a foundation and framework of the project. The Team explained how community input will help contribute to the larger community vision for success and resilience. The community was tasked with collaborating with the Team to help develop solutions. The public meeting presentation and meeting minutes are available in *Appendix G: Additional Files*.

The Town of Navassa RCCP Stakeholder Engagement Strategy is listed in *Appendix C: Community Engagement Strategy*.

1.4 Review of Existing Local and Regional Efforts

After forming the Community Action Team (CAT), the Team conducted a review of existing plans, ordinances, policies, and programs to identify work that has already been completed. The Team began with an inventory of relevant resources, then compiled information on the following key areas:

- Critical assets and natural infrastructure
- Social vulnerability
- Risk assessments
- Resilience-related projects

The Town was advised land use/development projects may also be considered and later included in the risk assessment. Once a review of existing data and information was complete, the Team identified and documented the additional data and resources necessary to complete the community's vulnerability and risk assessment, including:

- Inventory of critical assets and natural infrastructure
- Social vulnerability data
- Best available economic data

The review of existing local and regional resources focused on the following areas of overlap: inventory of critical assets, sea level rise projections, risk assessments, and resilience-related projects. Additionally, the review identified and filled data and information gaps for risk assessment inputs.

The Town of Navassa RCCP Review of Existing Local and Regional Efforts is listed in *Appendix D: Review of Existing Local and Regional Efforts*.

1.5 Risk and Vulnerability Assessment Report



The risks, vulnerabilities, and degree of exposure to natural hazards of the Town of Navassa and its population, built environment, and natural infrastructure now and into the future was examined in this section. The assessment included a review of the direct impacts to critical facilities, natural infrastructure, property, and population. In terms of natural infrastructure, the Town of Navassa land contains many areas of land or water that are important to protect from uncontrolled or incompatible development. Direct impacts from flooding are concentrated around the Town's major water bodies. Most critical assets and properties within the Town are located outside of the 100-year flood zone, however, some properties, including residential, lie within the floodplain and should be key considerations in future land use planning.

The Town of Navassa is vulnerable to natural hazards including flooding, sea level rise, and storm surge. The methodology used in this assessment helps to provide a better understanding of the degree of vulnerability of certain features as well as the associated risks. Critical facilities, natural infrastructure, property, and the Navassa population are in some cases, located in areas within the Town boundary that demonstrate higher risks and vulnerabilities to these natural hazards, providing crucial information for land use and conservation planning. These features were qualitatively assessed using Geospatial Information Systems (GIS) mapping and utilizing data from a variety of sources including local, state, federal, and non-profit agencies.

Social vulnerability was evaluated using the Center for Disease Control (CDC) guidelines. According to the results, the census block which falls between the Old Mill Road and railroad tracks is ranked as the most socially vulnerable area.

Loss estimates obtained using GIS were used to quantitatively assess vulnerability. Loss estimates included numbers of buildings, and critical facilities located in the identified hazard areas, an estimate of the potential losses to vulnerable structures. Additionally, an overall vulnerability score was assigned to each critical asset using the responses from CAT members. Wastewater treatment plant scored was ranked as the most vulnerable asset in Town followed by the new Town Hall.

1.6 Project Portfolio

In Phase 2, M&N worked with Town staff, the CAT, and community members to identify and prioritize a combination of policy, nonstructural, structural, and hybrid actions, including the use of natural and nature-based solutions (NNBS), organized within a Project Portfolio. The Town of Navassa's Project Portfolio is provided in *Appendix F: Project Portfolio*.

The Town of Navassa had previously identified several projects through an ongoing partnership with a federal/state trustee council that has resulted in funding for projects to offset impacts to coastal and riverine wetland habitats and water quality. Several projects were identified and planned with technical guidance and support from Land Management Group, a CAT member. The list of projects developed during Phase 2 and included within the Project Profile are considered extensions of those previously identified projects and are considered solutions to improving public safety from nuisance stormwater flooding and improvements to watershed management and reductions in source of pollution. Based on feedback from the Town and the CAT, the Project Portfolio includes fourteen projects to be further prioritized and analyzed for Phase 3: Feasibility, Engineering and



Design. These projects range from policy and community outreach, such as participating in the National Flood Insurance Program to nature-based solutions such as stream restoration and enhancement of wetlands, and hybrid solutions that may require a combination of stream crossing assessments and retrofits to benefit flood risk and fish passage.

An opportunity that arose during Phase 2 was collaboration with the Southeast Aquatic Resources Partnership (SARP), a partner of the Cape Fear River Partnership. SARP will provide resources to support an evaluation of barriers and stream crossings through existing funding from the National Fish and Wildlife Foundation. A standardized protocol will be used at high priority road stream crossings within the Town boundary in summer 2022 to determine if a culvert or structure is a barrier for fish, constricts flow, or is in poor condition. This inventory and feasibility analysis will help to inform and prioritize projects for the Town of Navassa to implement in the future.

1.6.1. Funding Coastal Resilience

The NC DCM has received \$545,000 from the National Fish & Wildlife Foundation Coastal Resilience Fund and \$1.15 million from the General Assembly to continue and expand the RCCP. The NC DCM is currently drafting a "Request for Applications" (RFA) for Phase 3 of the RCCP. Phase 3 will fund the Engineering and Design of a prioritized project. It is estimated a total of \$40,000 will be available for each selected project. The Phase 3 RFA is anticipated to be posted in early 2022 (with an application deadline of March 2022).

Phase 4 RFA is anticipated to be posted late summer/early fall 2022.

1.7 Additional Files

1.7.1. Geospatial Information Systems Methodology

The data used in this assessment was obtained from a variety of sources, including federal, state, and local agencies, as well as the nonprofit sector. These sources, along with their corresponding maps and feature layers created from their data, are displayed in Table 1 below. Some data was not explicitly given and had to be calculated. For instance, the data obtained from the US Census provided the number of individuals in the total population for each block group as well as the number of individuals in each age range in the Census data. In the social vulnerability maps displaying vulnerable age groups (65 years and older, under 5 years, and under 18 years), the percent of population under/over each age range was calculated using ArcMap field calculator. In each map's attribute table, calculations were obtained by inputting "Age65Plus (or AgeUnder18 or AgeUnder5) / Total_Popu" where "Total_Popu" indicates the total number of individuals in that block group. This number was then multiplied by 100 to obtain a percent. The same methodology was used to create the Percent Under Poverty map with Census data.



Table 1. List of Maps, feature layers displayed in each map, and data sources for each feature layer data set used for all GIS map products included in Risk and Vulnerability Assessment

Map	Data	Source
Natural Infrastructure	<ul style="list-style-type: none"> Streams Wetlands 	<ul style="list-style-type: none"> https://data-brunscopendata.arcgis.com/ https://deq.nc.gov/about/divisions/coastal-management/coastal-management-data/setback-factor-maps-1998-shoreline/coastal-wetlands-spatial-data#Wetlands
Critical Features and Flood Zones	<ul style="list-style-type: none"> Fire Stations Government Buildings Flood Hazard (NCFRIS) 	<ul style="list-style-type: none"> https://data-brunscopendata.arcgis.com/, Town of Navassa https://fris.nc.gov/fris/Download.aspx?FIPS=019&ST=NC&user=General%20Public
Municipal Zoning Parcels and Flood Zones	<ul style="list-style-type: none"> Municipal Parcels Flood Hazard (NCFRIS) 	<ul style="list-style-type: none"> https://data-brunscopendata.arcgis.com/ https://fris.nc.gov/fris/Download.aspx?FIPS=019&ST=NC&user=General%20Public
Storm Surge Inundation	<ul style="list-style-type: none"> Storm Surge Inundation (SLOSH model), hurricane categories 1-5 	<ul style="list-style-type: none"> National Storm Surge Hazard Maps - Version 2 (noaa.gov)
Sea Level Rise Inundation	<ul style="list-style-type: none"> Sea Level Rise (1-10ft) 	<ul style="list-style-type: none"> https://coast.noaa.gov/slrdata/
Previous Hurricane Flood Inundation	<ul style="list-style-type: none"> Hurricane Matthew and Hurricane Florence areas of inundation 	<ul style="list-style-type: none"> The Nature Conservancy
FEMA Flood Zones	<ul style="list-style-type: none"> 100-Year Flood Zone 500-Year Flood Zone 	<ul style="list-style-type: none"> North Carolina Flood Risk Information System (NC FRIS)

Additionally, some feature layers were created manually. For instance, some critical facilities, such as the government buildings, were created as new points, seeing as Brunswick County GIS Data did not have all the newly developed facilities in its data collection. For these facilities, building addresses were provided by Town staff and latitude and longitude coordinates were identified based on the address. After the coordinates were identified, these points were created manually in ArcMap by inputting the coordinates as a new point in the feature layer.

Some feature layer data was modified for the purpose of readability and simplification. For example, the SLOSH data obtained from the National Oceanic and Atmospheric Administration (NOAA) for use in the Storm Surge map displayed dozens of colors and various ranges for each hurricane category. New fields were added to the attribute table in ArcMap to collate all shapefiles within the range for each hurricane category and color coding was applied to the entire field, so that each hurricane category would be represented by a single color for easy readability.

To create the Municipal Zoning Parcels and Flood Zones map, a similar methodology to the Storm Surge Map was used. A new field was created in ArcMap to assign each parcel a category based on its zoning code (commercial, residential, industrial, or other/open space). Brunswick County zoning records as well as Town of Navassa zoning records were used to identify the various zoning codes given to each parcel and assign each a category in the new field. For example, there were numerous zoning codes, some county and some municipal, that coded for multiple



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types of residential parcels, and multiple types of commercial parcels, etc. The multiple county and municipal codes were categorized as one of the four designated groupings, providing for easier readability.

Additional files, such as mapping products and all outreach material, can be found in *Appendix G: Additional Files*.

PROJECT CONTACT

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