From Resilience Planning to Implementation: Successes of the N.C. Resilient Coastal Communities Program

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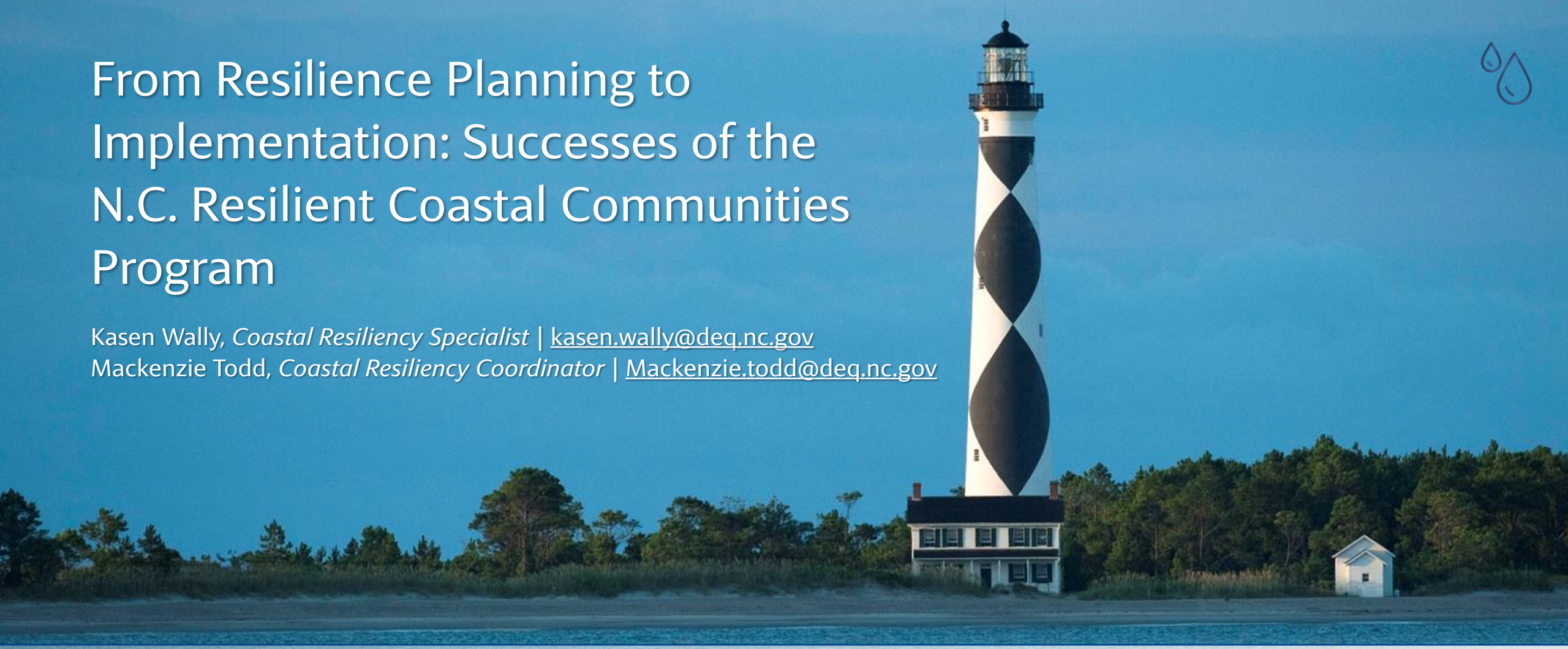

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NC DIVISION OF COASTAL MANAGEMENT

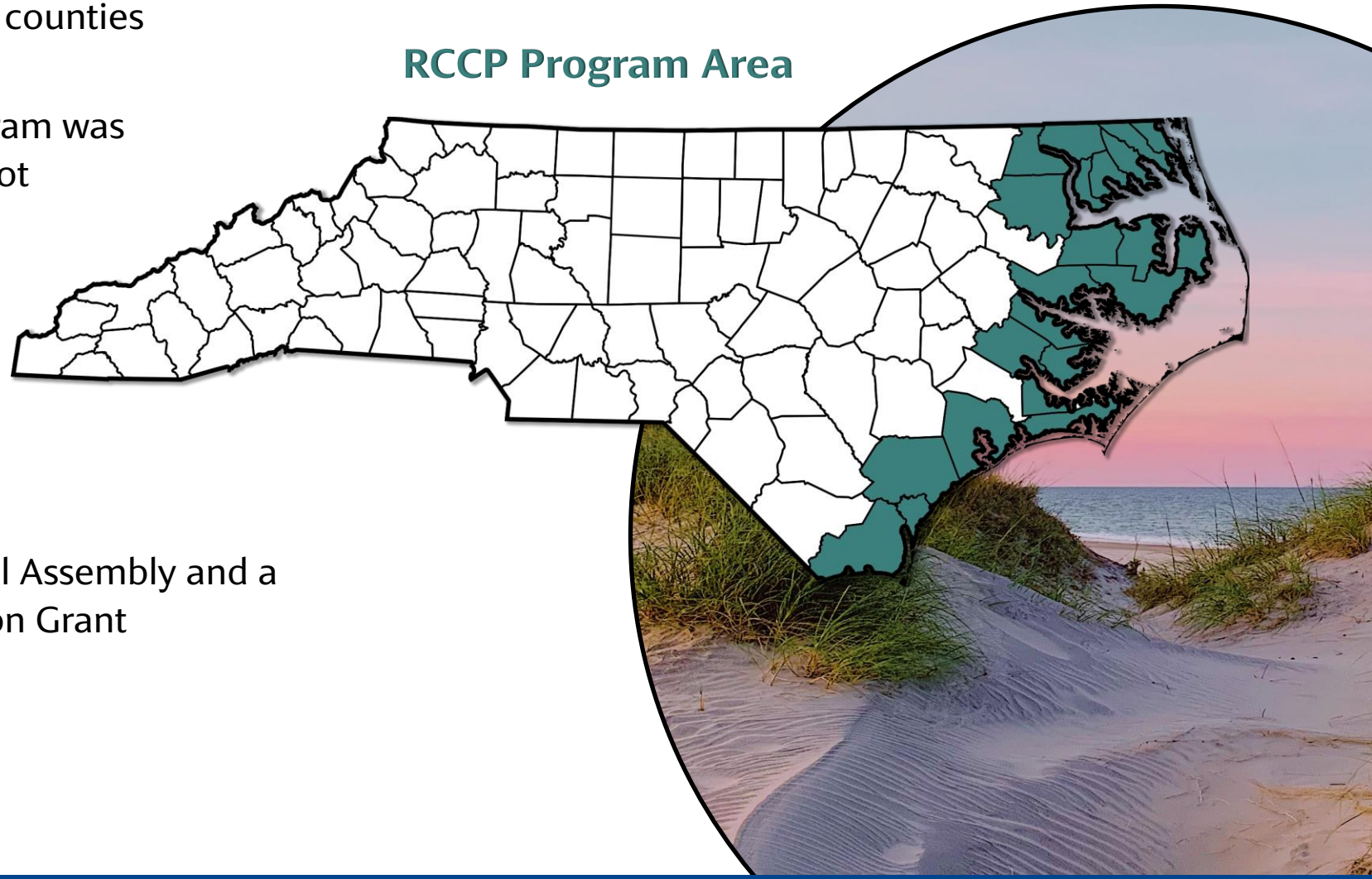
DEQ NORTH CAROLINA Department of Environmental Quality

North Carolina RESILIENT COASTAL COMMUNITIES PROGRAM

N.C. Division of Coastal Management, 400 Commerce Ave., Morehead City, NC 28557 | Tel: (252) 515-5400 | Email: RCCP@deq.nc.gov

Program Background

- Program Scope: 20 coastal CAMA counties
- The foundation of the RCCP program was laid in 2016 through the RENA pilot program
- Executive Order 80 created the NC Climate Risk & Resilience Plan, which eventually led to the RCCP
- RCCP Funded through the General Assembly and a National Fish & Wildlife Foundation Grant



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Program Partners & Funding

The Nature Conservancy

NCORR
NORTH CAROLINA OFFICE OF RECOVERY AND RESILIENCY

Sea Grant
North Carolina

NATIONAL FISH AND WILDLIFE FOUNDATION
NFWF

THE GREAT SEAL OF THE STATE OF NORTH CAROLINA
MAY 20, 1775
APRIL 12, 1776
ESSE QUAM VIDERI

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
U.S. DEPARTMENT OF COMMERCE

NC DIVISION OF COASTAL MANAGEMENT

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

Program Phases

Phase 1

COMMUNITY ENGAGEMENT & VULNERABILITY ASSESSMENT

Includes performing a risk and vulnerability assessment, developing a community action team, and engaging with the public.

Phase 2

PLANNING, PROJECT IDENTIFICATION, & PRIORITIZATION

Involves a community and data-driven process to identify priority actions that can be taken to adapt to short- and long-term hazards.

Phase 3

ENGINEERING & DESIGN

Grants are available for communities that successfully completed Phases 1 and 2 to develop projects that are shovel-ready.

Phase 4

PROJECT IMPLEMENTATION

Phase 4 grants are available for communities that successfully complete Phases 1, 2, and 3 for the implementation of shovel-ready projects.

Deliverables

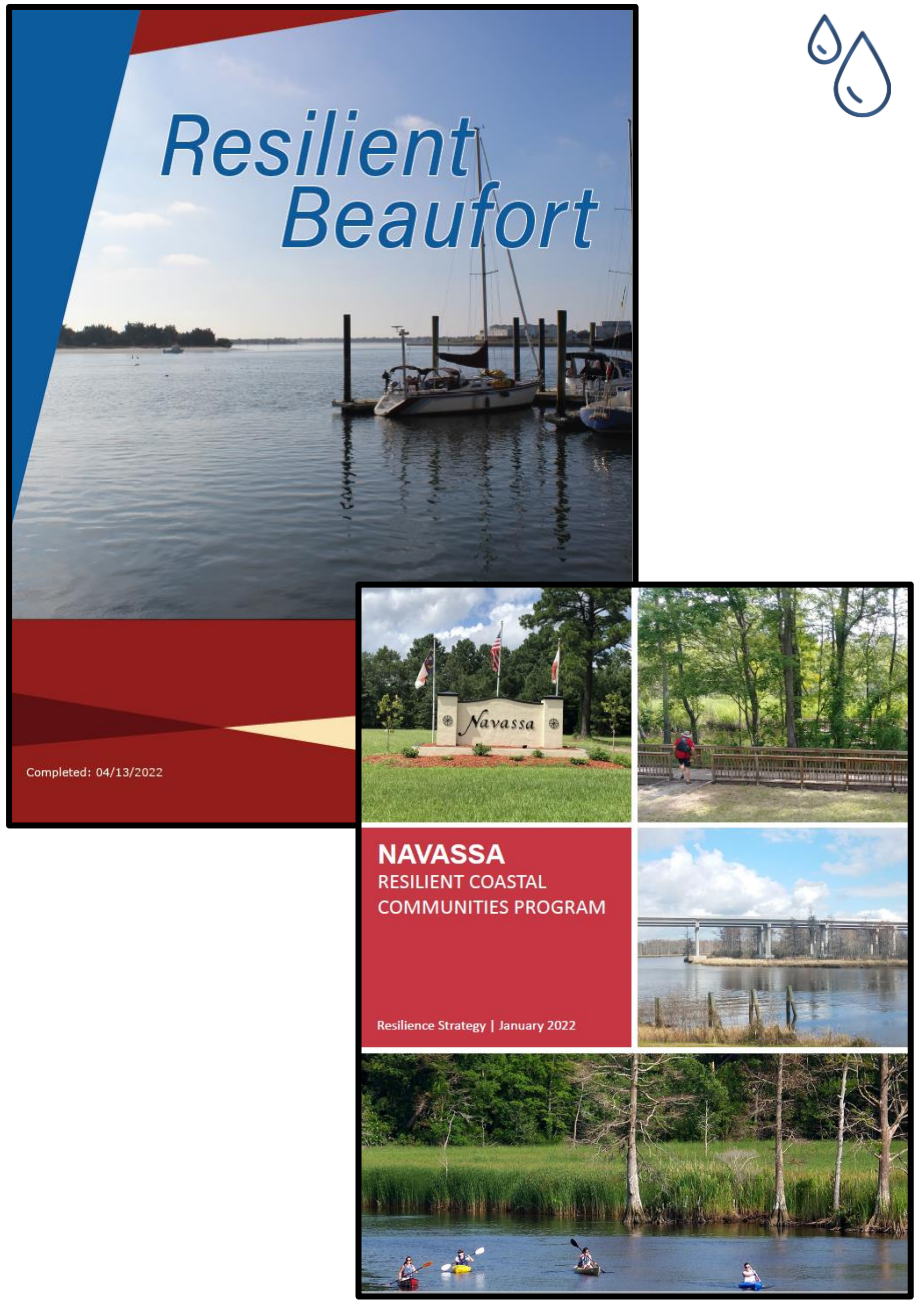
The main deliverable will include a Resilience Strategy based on guidance provided in the handbook. The two components include:

1. **Vulnerability Assessment Report:**

    - Details the quantitative and qualitative elements of assessment(s) performed

2. **Project Portfolio:**

    - Outlines a series of options to address coastal hazards with local, community-specific information.



Program Accomplishments (2020-2023)

$1.86M awarded to conduct vulnerability assessments and identify projects in **41 communities** (**Phases 1 & 2**).

$1.14M awarded to design and engineer **20 top-priority resilience projects** (**Phase 3**).

$1.16M awarded to implement **5 shovel-ready projects** with nature-based components (**Phase 4**).

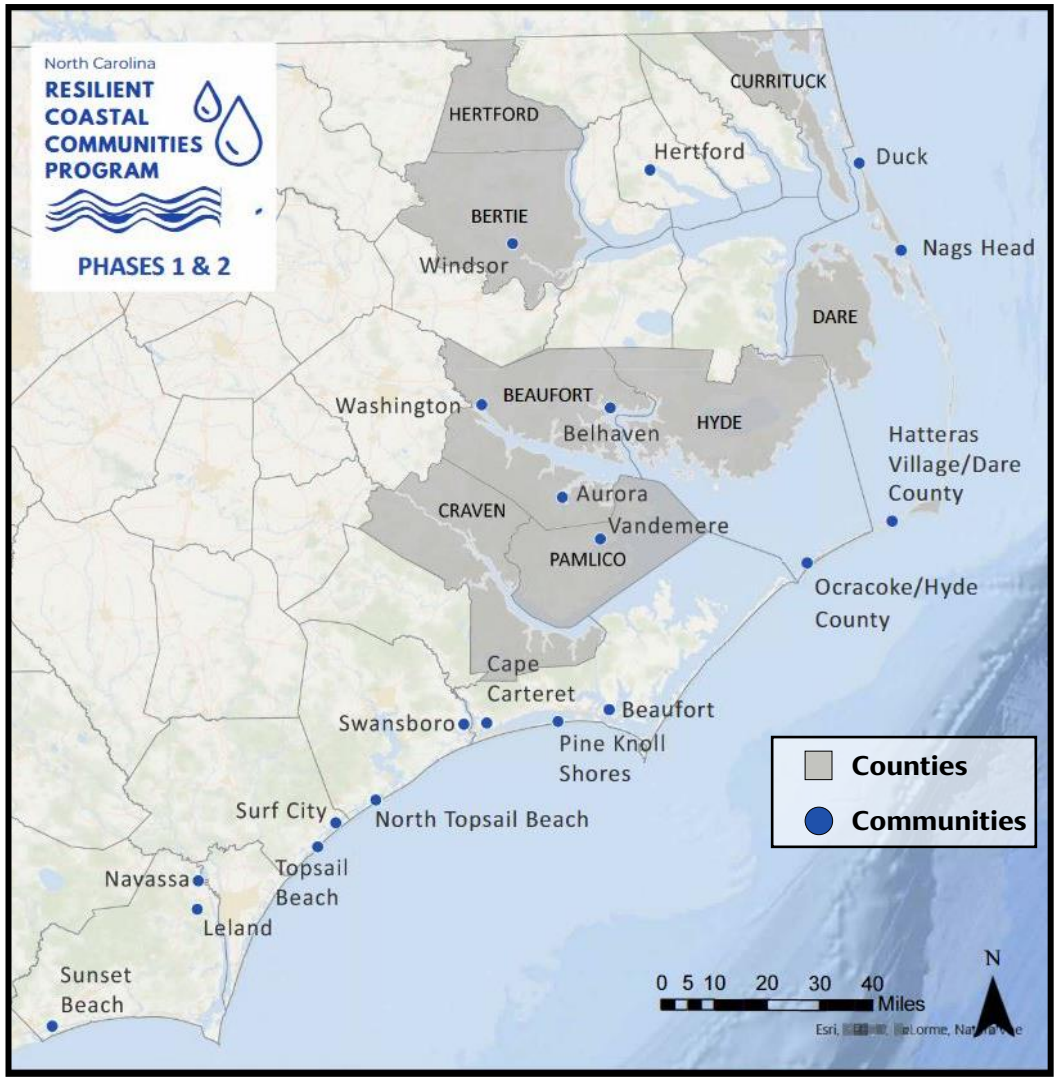
Engineering Project Insights

- 52% focused on stormwater management and flooding.
- 24% focused on policy and planning initiatives.
- 24% focused on natural and nature-based solutions.

First Round, Phases 1 & 2 (2020 – 2022)

- 26 communities (8 counties and 18 municipalities)
- 10 contractors
- Total Funding Amount for Phases 1 & 2: $775,000
- Previous Resilience Strategies on the RCCP Website

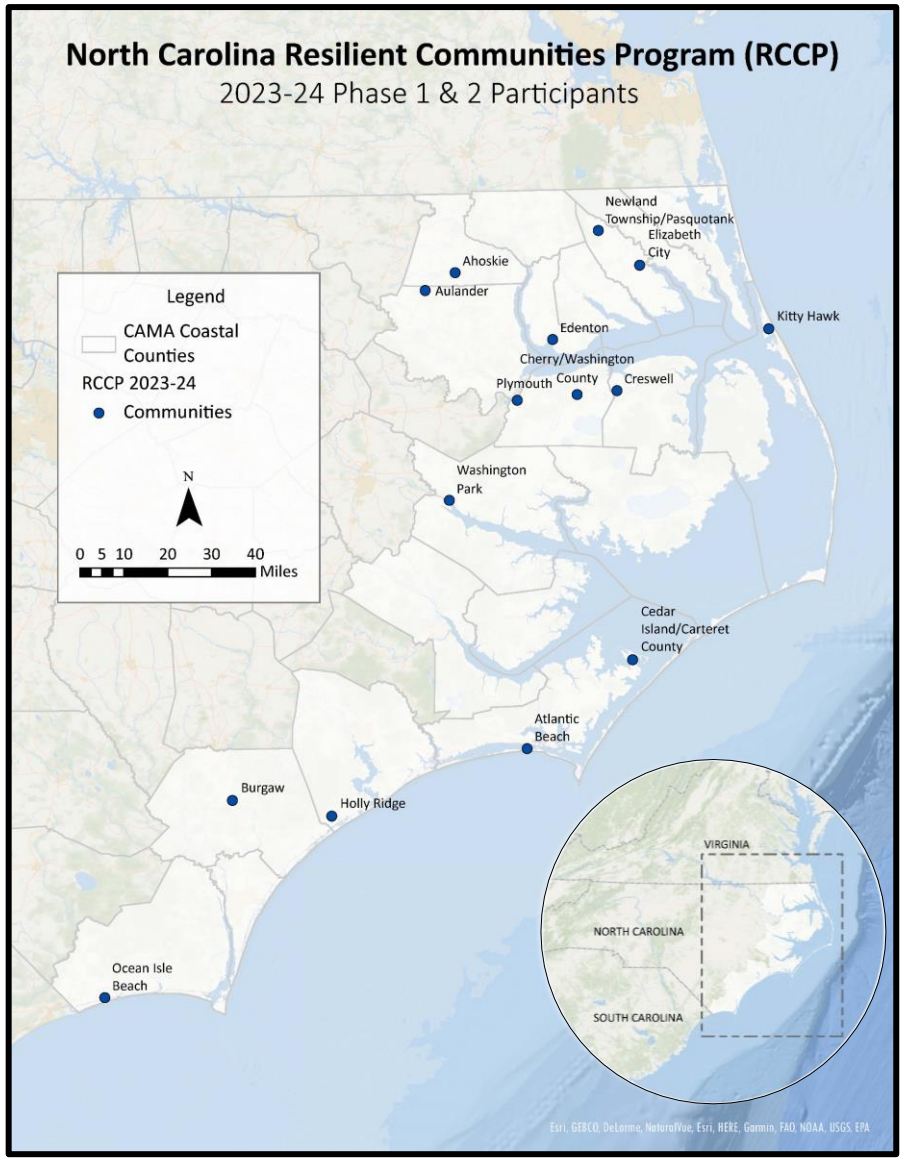
- **RK&K and Mideast Commission:** Aurora, Beaufort County, Belhaven, and City of Washington
- **SWCA:** Hertford County, Windsor, and Bertie County
- **Withers Ravenel:** Dare County (Hatteras Village), and Currituck County
- **Kimley Horn:** Vandemere, Pamlico County, and Hyde County (Ocracoke)
- **Dewberry:** Craven County, Pine Knoll Shores, Swansboro, and Cape Carteret
- **Moffatt & Nichol:** Navassa, Leland, and Sunset Beach
- **Kleinfelder:** Surf City, Topsail Beach, and North Topsail Beach
- **Stewart:** Town of Beaufort



Current Round, Phases 1 & 2 (2023-2024)

- 15 communities (3 counties and 12 municipalities)
- 9 contractors
- Total Funding Amount for Phases 1 & 2: $1.19 M

- **Dewberry:** Carteret County and Atlantic Beach
- **Kleinfelder:** Burgaw and Holly Ridge
- **Moffatt & Nichol:** Ocean Isle Beach
- **RK&K/Mid-East Commission:** Ahoskie Township, Aulander, Plymouth, and Washington Park
- **Stewart:** Kitty Hawk
- **SWCA:** Creswell and Washington County
- **WSE:** Elizabeth City and Pasquotank County
- **WSP:** Edenton



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First Round, Phases 3 & 4 (2022 – 2024)

Phase 3:

- 22 communities (3 counties, 19 municipalities).
- Total Funding: $1.14M

Phase 4:

- 5 municipalities accepted into Phase 4
  - Washington, Belhaven, Vandemere, New Bern, Pine Knoll Shores
- Total Funding: $1.16M

A Closer Look

Background:

- Population: 1,600
- Poverty Rate: 29.9%
- CDC Social Vulnerability Index: High (.846)

Hazards/Barriers:

- Wind-driven and tidal flooding, storm surge, and heavy rainfall.
- Noted limited capacity and financial constraints.

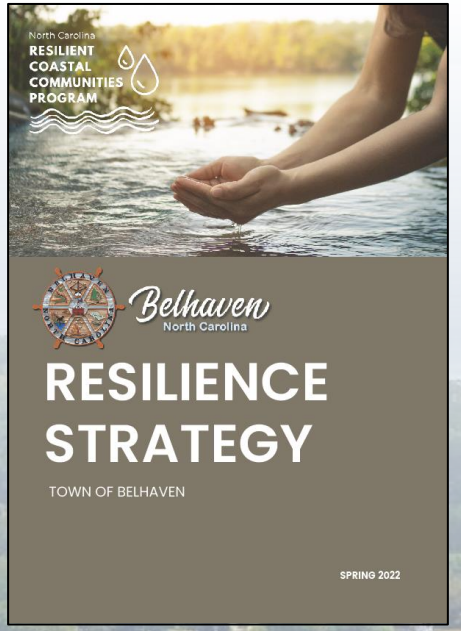


Photo Credit: www.marinas.com

A Closer Look

Top Left: Sunny Day Flooding

Top Right: Hurricane Flooding

Bottom Right: Hurricane Flooding

Photo Credit: www.marinas.com

Phase 1 – Initial Steps

Step 1 - Develop an inclusive and diverse Community Action Team.

Step 2 – Review existing plans and efforts.

Step 3 – Set Visions and Goals:

Belhaven is a resilient community supporting the sustainable growth of its population and economic base through strategic investments in flood mitigation projects, effective response and recovery, quality municipal infrastructure and services, and the development of waterfront assets supporting public recreation and ecotourism. The town is able to rebound quickly following hazard events due to strong partnerships and frequent communication with residents.

Phase 1 – Goals

Economic

Improve and maintain buildings to support resilience to hazards and provide quality municipal infrastructure

Incremental steps to achieve the community's vision

Social

Educate the public about resilience and foster strong partnerships with the residents.

Environmental

Reduce flooding and improve stormwater management while preserving natural resources

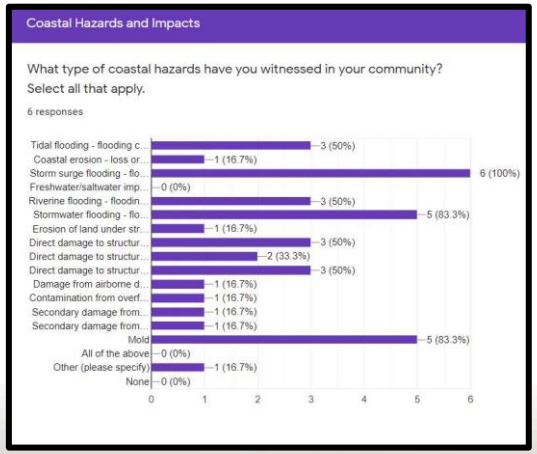
Phase 1 – Community Engagement

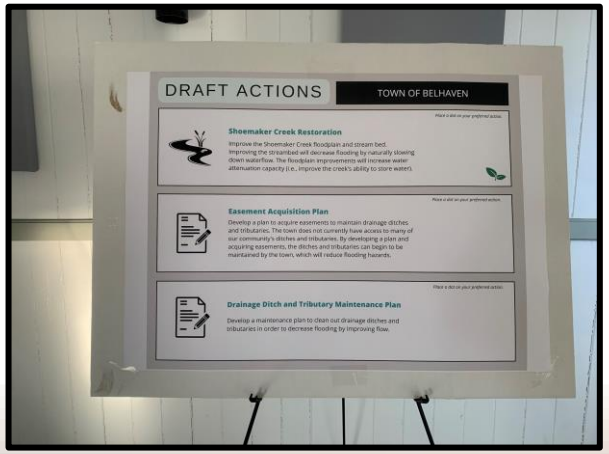
Step 4 – Develop a Community Engagement Strategy

Ensures equitable representation, trust, diverse partnerships, feedback, data validation, and assistance in selecting and prioritizing projects.

Forms of Communication Used:

- Public Survey
- Webpage/Online Story Map
- Notifications (news releases, social media ads, flyers)
- Public Open Houses (In-person and Virtual)

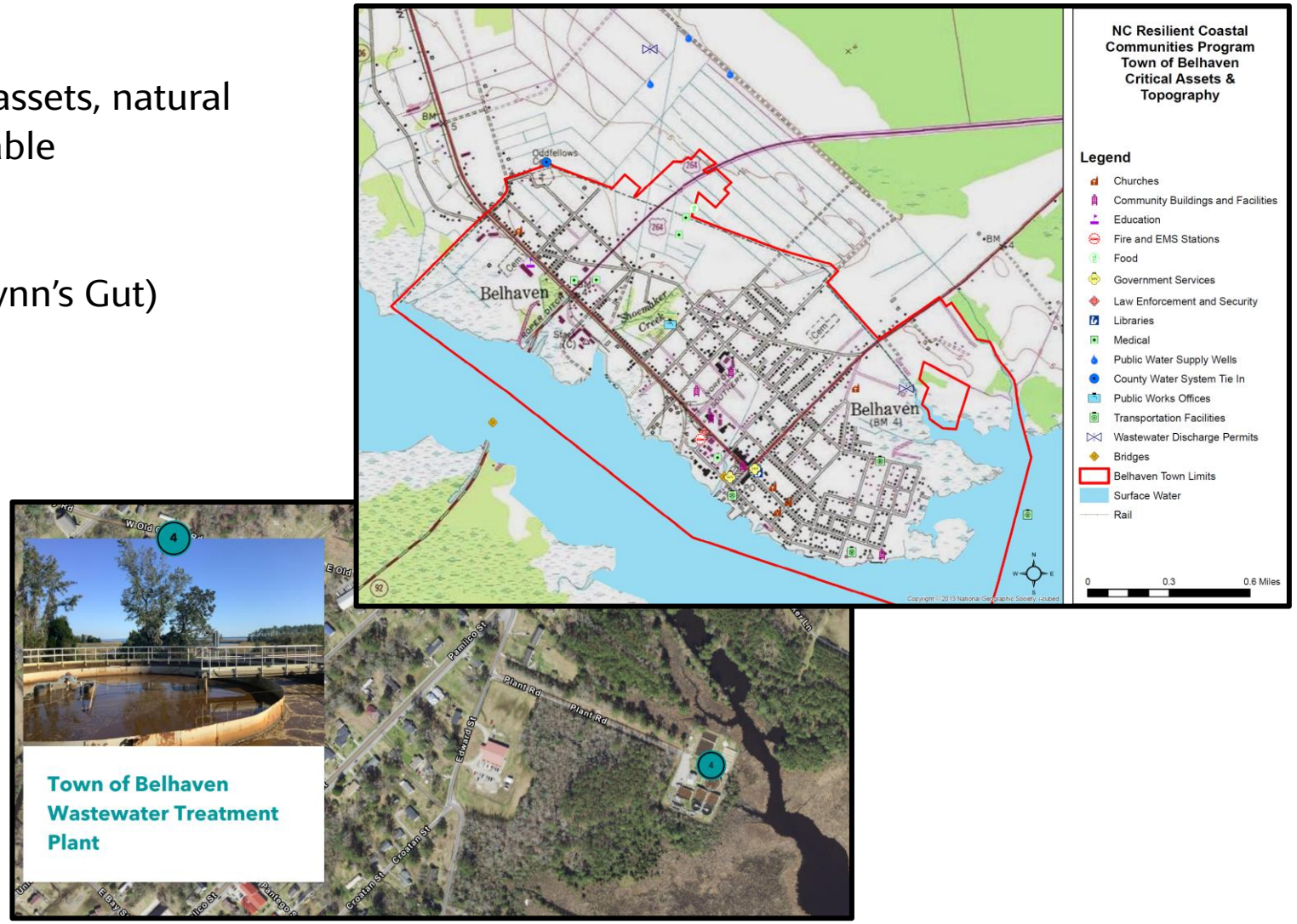




Phase 1- Mapping

Step 5 - Identify and map critical assets, natural infrastructure, and socially vulnerable populations.

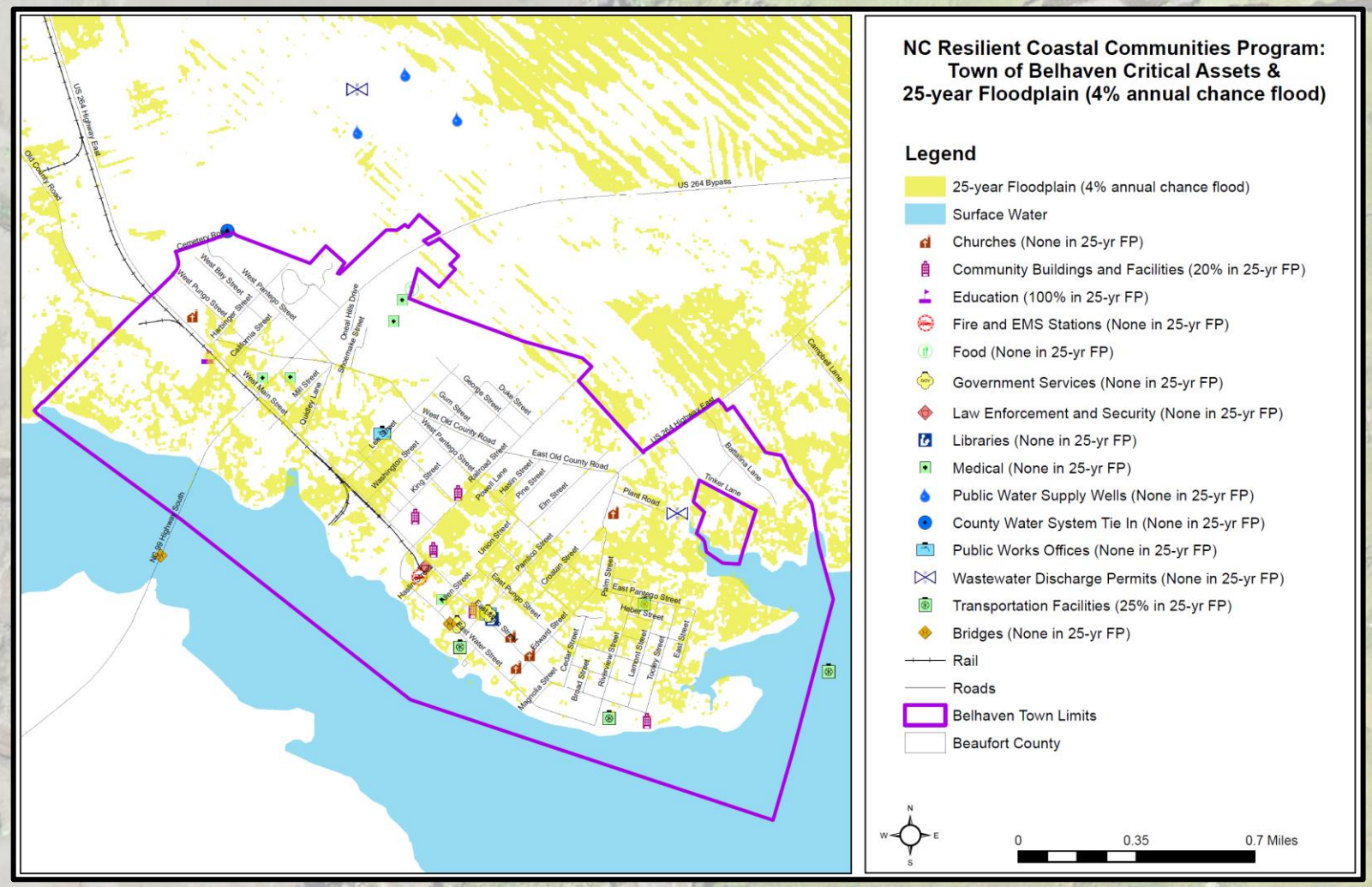
1. Various roads and streams (Wynn's Gut)
2. Senior Center
3. Christian Academy
4. Wastewater Treatment Plant
5. Various well systems



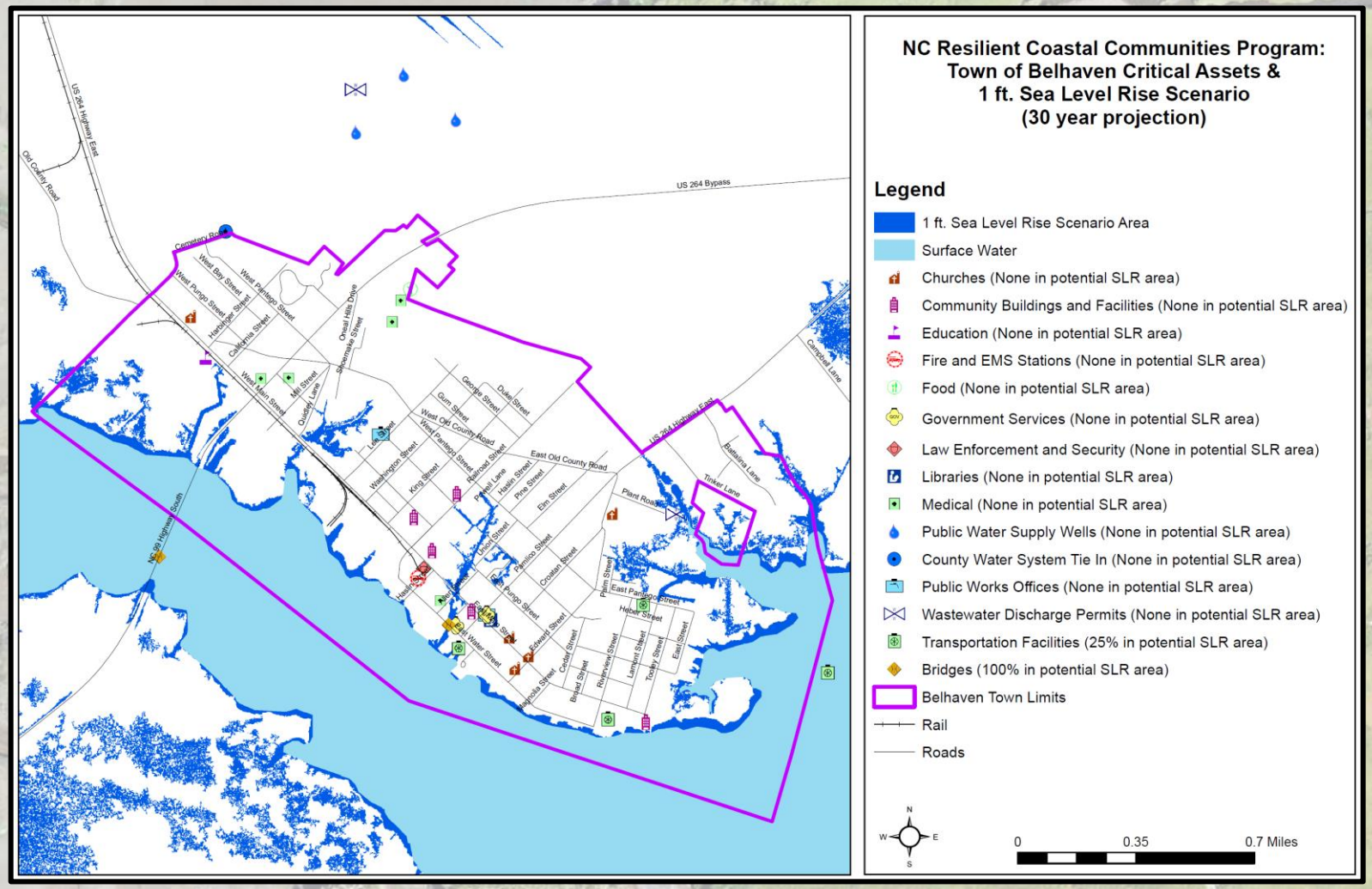
Phase 1 - Risk & Vulnerability Assessment

Step 6 – Conduct a Risk and Vulnerability Assessment

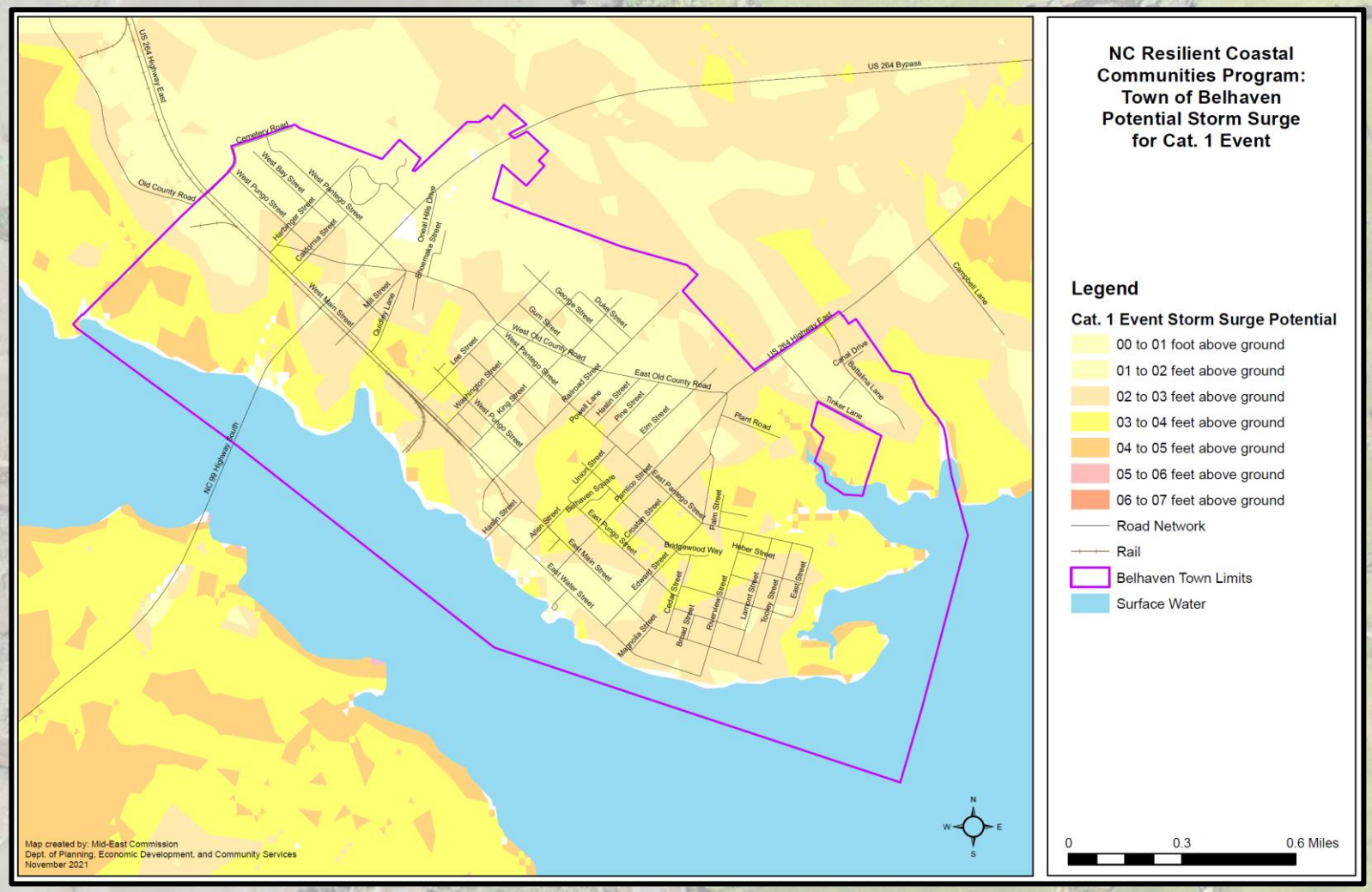
Map hazards, overlay them with critical assets and vulnerable populations, and calculate vulnerability scores to guide mitigation strategies.



Phase 1 - Risk & Vulnerability Assessment



Phase 1 - Risk & Vulnerability Assessment



Phase 1 - Risk & Vulnerability Assessment

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TOWN OF BELHAVEN

CRITICAL ASSET & NATURAL INFRASTRUCTURE VULNERABILITY

Asset	Exposure Score 0-3	Sensitivity Score 0-3	Adaptive Capacity 0-3	Vulnerability Score 0-6
Asset name	*0 = no exposure 1 = low 2 = medium 3 = high*	*0 = no sensitivity 1 = low 2 = medium 3 = high*	*0 = no adaptive capacity 1 = low 2 = medium 3 = high*	*0-2 = low 3-4 = medium 5-6 = high*
Emergency				
Fire and EMS	2	3	2	Med
Town of Belhaven Police Dept.	2	3	1	Med
Government Services				
Chamber of Commerce	2	2	2	Low
Belhaven Town Hall	3	2	2	Med
Community				
Belhaven Senior Center	3	3	0	High
Boat Yard and Marinas	3	1	0	Med
Belhaven Boys and Girls Club	2	2	1	Med
Civic Center	2	2	1	Med
Charlie Smith Community House	3	2	1	Med
The Wilkinson Center	1	2	2	Low
TJ's Marina and Boatyard	3	2	2	Med
Churches				
Trinity United Methodist Church (note- group churches together for final version)	1	2	1	Low
First Christian Church	1	2	1	Low
Belhaven Missionary Baptist Church	1	2	1	Low
Food				
Food Lion	2	3	1	Med
Education				

North Carolina RESILIENT COASTAL COMMUNITIES PROGRAM

TOWN OF BELHAVEN

RISK ESTIMATE

Sector	Number of Critical Assets at Risk	Asset Value
E.g., government facilities, utilities, natural infrastructure	*#*	*$X,000,000*
Emergency Management	0	-
Law Enforcement	1	$86,174
Fire and EMS Stations	1	$308,816
911 Dispatch	0	-
Government Services	2	$343,342
Food	1	$1,622,361
Water/Wastewater	7	$883,678
Electric Sub-station	1	$412,321
Bridges	1	$783,480
Roads	65 (86.23 miles)	$438,809,293.52
Transportation Facilities	3	$1,956,116
Medical	6	$3,424,610
Schools	1	$446,502
Libraries	1	$553,789
Churches	6	$3,092,889
Community Buildings and Facilities	5	$1,515,908
Hazards	20	$4,662,535
Wetland	21 (185.5 ac.)	$12,510,502.13
Streams	5 (7.3 Stream Miles)	$23,275,565.28
Parks/Public Land	3	$19,388,944
Public Boat Ramps	1	$298,683
Managed Areas	3	$189,093

Estimate Risk

Determine what levels of risk call for actions to reduce that risk and increase resilience.

Hazard Mitigation Plans contain risk assessments that used NCEM's iRISK data for building footprints, building values, and other data on critical facilities. These data can be extracted, expanded to include additional critical assets and natural infrastructure, and updated with current economic data. It will be useful to have a good understanding of the locations of vulnerable populations that may need targeted assistance including where there may be clusters that allow for neighborhood-scale strategies.

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Phase 2 – Project Identification, Consolidation, & Prioritization

Step 1 – Identify a Suite of Potential Solutions

Step 2 – Consolidate and prioritize Projects

Benefit-Cost Overview

The cost or the economic case for different strategies or actions must be considered when developing resilience strategies. An informal cost-benefit analysis should be used to review proposed adaptation actions. Ratings of high, medium, or low are assigned to the anticipated costs and the benefits associated with each action based on general criteria that are established by the community.

Make sure to explore and identify potential funding mechanisms for project or action item implementation.

	Benefit/cost ratings
	Benefit
HIGH	Action would have significant impact on risk reduction
MEDIUM	Action would have an impact on risk reduction
LOW	Long-term benefits are difficult to quantify in the short term
	Cost
HIGH	Existing funding is not adequate
MEDIUM	Requires budget reapportionment or amendment
LOW	Funding available under the existing budget

North Carolina RESILIENT COASTAL COMMUNITIES PROGRAM

Belhaven

Benefit/Cost Ratings

Strategy	Benefit	Cost
List Strategy Here.		
1. Improve jetty to slow down water. **Comments:**	MEDIUM	HIGH
2. Restore wetlands along eastern shore (Tooleys Creek). **Comments:**	MEDIUM	MEDIUM
3. Design a maintenance plan to clean out drainage ditches and tributaries. **Comments:**	HIGH	MEDIUM
4. Develop easements to maintain drainage ditches and tributaries. **Comments:**	MEDIUM	MEDIUM
5. Implement a stormwater ordinance. **Comments:**	LOW	LOW
6. Implement a bioswale policy. **Comments:**	LOW	LOW
7. Implement a pervious surface policy. **Comments:**	LOW	LOW
8. Evaluate the feasibility of land acquisition by government, communities, businesses, or non-profit organizations of vulnerable parcels for permanent protection and management. **Comments:**	MEDIUM	LOW
9. Evaluate the relocation or buy out potential of structures and infrastructure in vulnerable areas. **Comments:**	MEDIUM	LOW
10. Set up processes for transfer of development rights, conservation easements, and/or setback requirements. **Comments:**	MEDIUM	LOW
11. Consider the use of levees, dikes, floodwalls, flood gates, tide gates, and other structural means to protect vulnerable areas. **Comments:**	MEDIUM	LOW

RCCP STAPLEE Criteria Worksheet
Belhaven

STAPLEE Criteria >>	Social		Technical			Administrative			Political			Legal			Economic				Environmental					TOTAL
Considerations for Alternative Actions	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land/Water	Effect on Endangered Species	Effect on HAZMAT Waste Sites	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	
ACTION: Drainage Ditch and Tributary Maintenance Plan Design a maintenance plan to clean out drainage ditches and tributaries	1	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	0	0	1	1	18
ACTION: Easement Acquisition Plan Develop easements to maintain drainage ditches and tributaries.	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	1	1	20
ACTION: Pervious Surface Policy Implement a pervious surface policy.	1	1	1	1	0	0	0	1	0	1	0	1	1	1	1	1	0	1	1	1	1	1	1	17
Evaluate the feasibility of land acquisition by government, communities, businesses, or non-profit organizations of vulnerable parcels for permanent protection and management.	0	1	1	1	0	1	0	0	1	1	0	0	1	0	1	0	1	1	0	0	0	0	0	10
Evaluate the relocation or buy out potential of structures and infrastructure in vulnerable areas.	1	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	0	0	0	0	15
Consider the use of levees, dikes, floodwalls, flood gates, tide gates, and other structural means to protect vulnerable areas.	1	1	1	1	0	1	0	0	1	1	1	1	0	0	1	1	0	0	1	0	0	1	1	14
Create a flood attenuation park along Water Street.	1	1	1	1	1	1	0	0	1	1	1	0	0	1	1	1	0	1	1	0	0	1	1	16
ACTION: Battalina Creek Mitigation Mitigate stream along WWTP to slow down flow.	1	1	1	0	1	1	0	0	1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	17
ACTION: Wynne's Gut Improvements Improve floodplain in Wynne's Gut while decreasing flow to pump water out for high water events. (See Moffit & Nichol engineering study for Wynne's Gut. The town recently applied for a FEMA BRIC grant for pumps at Wynne's Gut, but it was rejected due to the Cost Benefit Analysis.)	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	21
ACTION: Shoemaker Creek Restoration Improve Shoemaker Creek floodplain and stream bed.	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	21

North Carolina RESILIENT COASTAL COMMUNITIES PROGRAM

TOWN OF BELHAVEN

Wynne's Gut Improvements

Project Summary					
Project Name	Wynne's Gut Improvements				
Project Description	Improve the floodplain and install water pumps in Wynne's Gut. The floodplain improvements will reduce flooding, while the pumps will lower the water elevation during high water events. Floodplain improvements could include: grading, planting trees and other vegetation, developing nature trails and other recreation areas, and/or installing natural levees. This action has been studied by Moffatt & Nichol and was found to be a viable solution.				
Hazard(s) Addressed by Project	List Hazards Specific to the Community Which Impact the Project Location (Refer to Hazard Mapping) ▪ Flooding / Flood Zones ▪ Storm Surge ▪ Sea Level Rise				
Type of Solution/Strategy Area	List Strategy Area Column(s) from Matrix (e.g., Policy/Regulatory, Staffing, Funding & Resources, Emergency Services, Infrastructure, Nature-Based, Hybrid) ▪ Hybrid				
Type of Strategy Approach	List Strategy Approach from Matrix (e.g., Avoid, Accommodate, Protect, Retreat, Build Adaptive Capacity) ▪ Protect				
Project Estimated Cost	$200,000 - $500,000				
Potential Implementation Funding Sources	Potential Sources for Project/Action Implementation ▪ RCCP ▪ American Rescue Plan Act (ARPA) ▪ NC DEQ Water Resources Dev. Grant (WRDG) NRCS EQIP				
Project Estimated Timeline	Estimated Length of Time to Complete and Any Expected Delays in Timeline (e.g., 3 months, 6 months, 1 year, 5 years)				
Priority Rating	High				
Potential Submission for RCCP Phase 3	♦	Yes		No	*Project must be a nature-based solution or hybrid solution to be considered for RCCP Phase 3.*

Project Map

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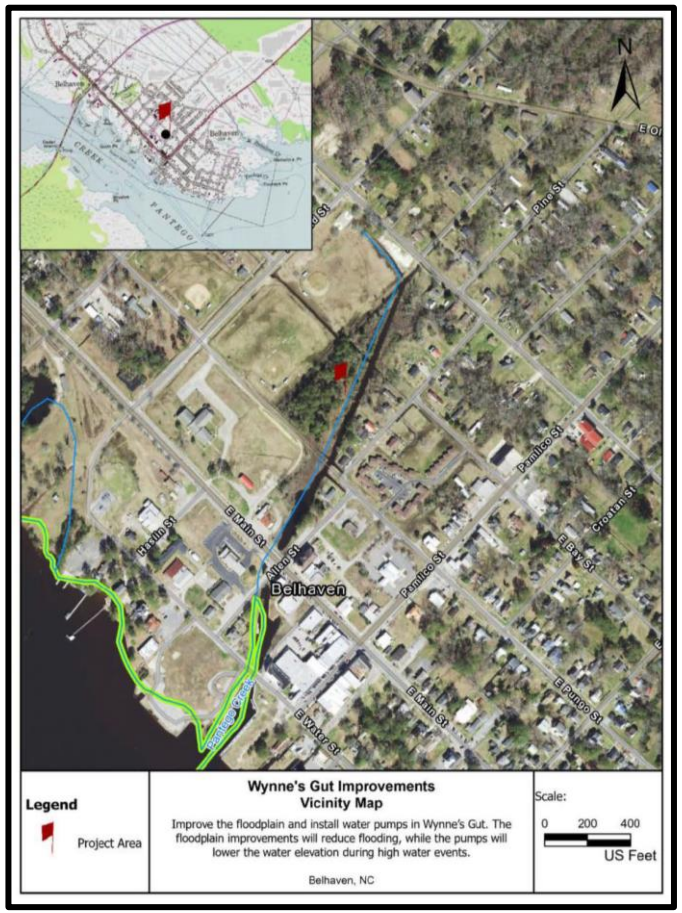
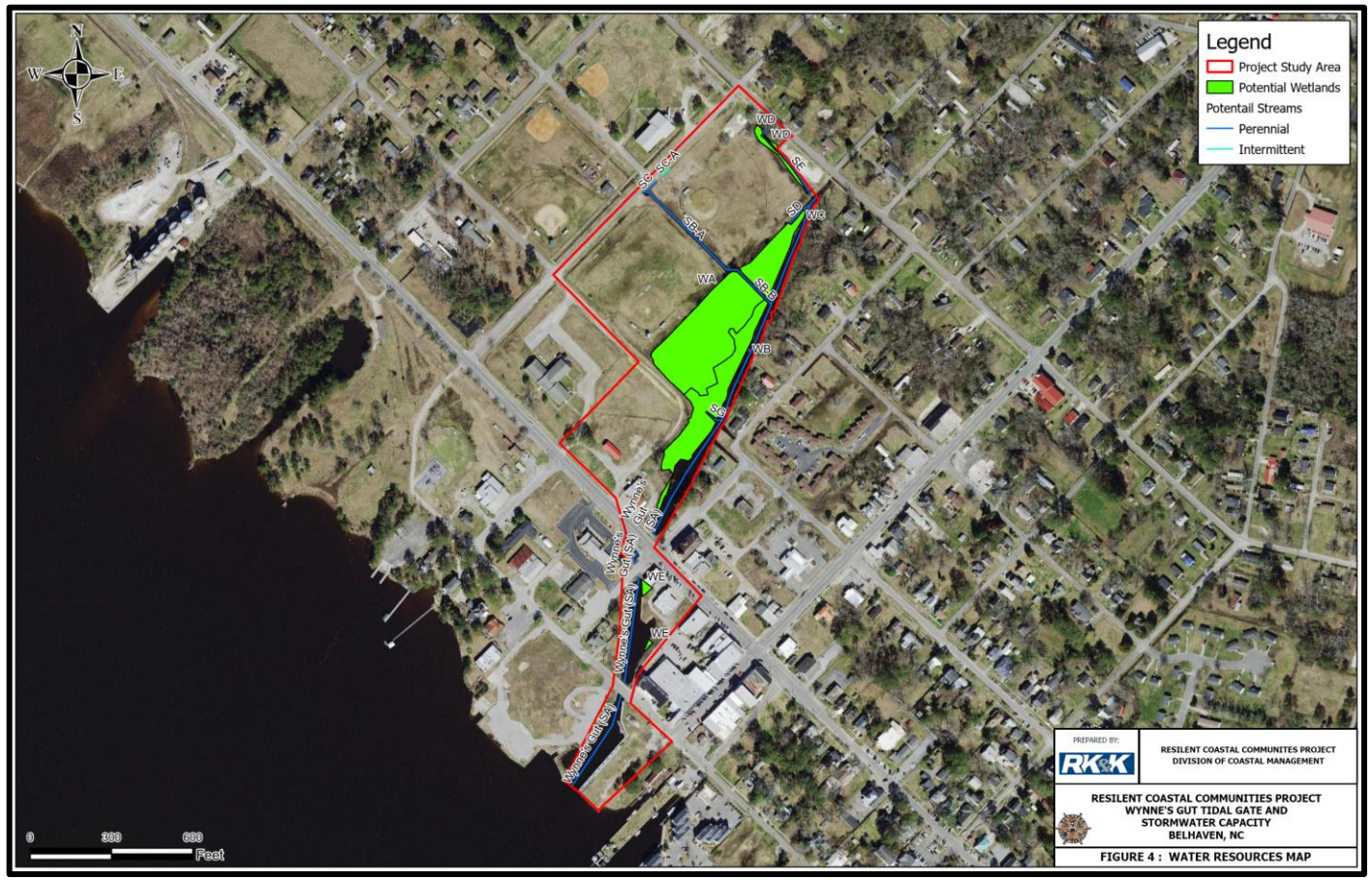
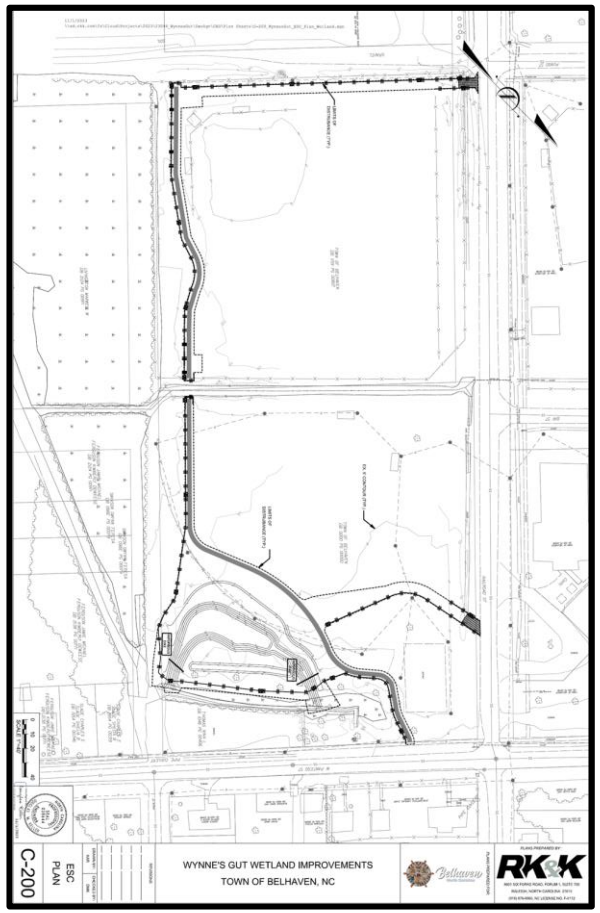
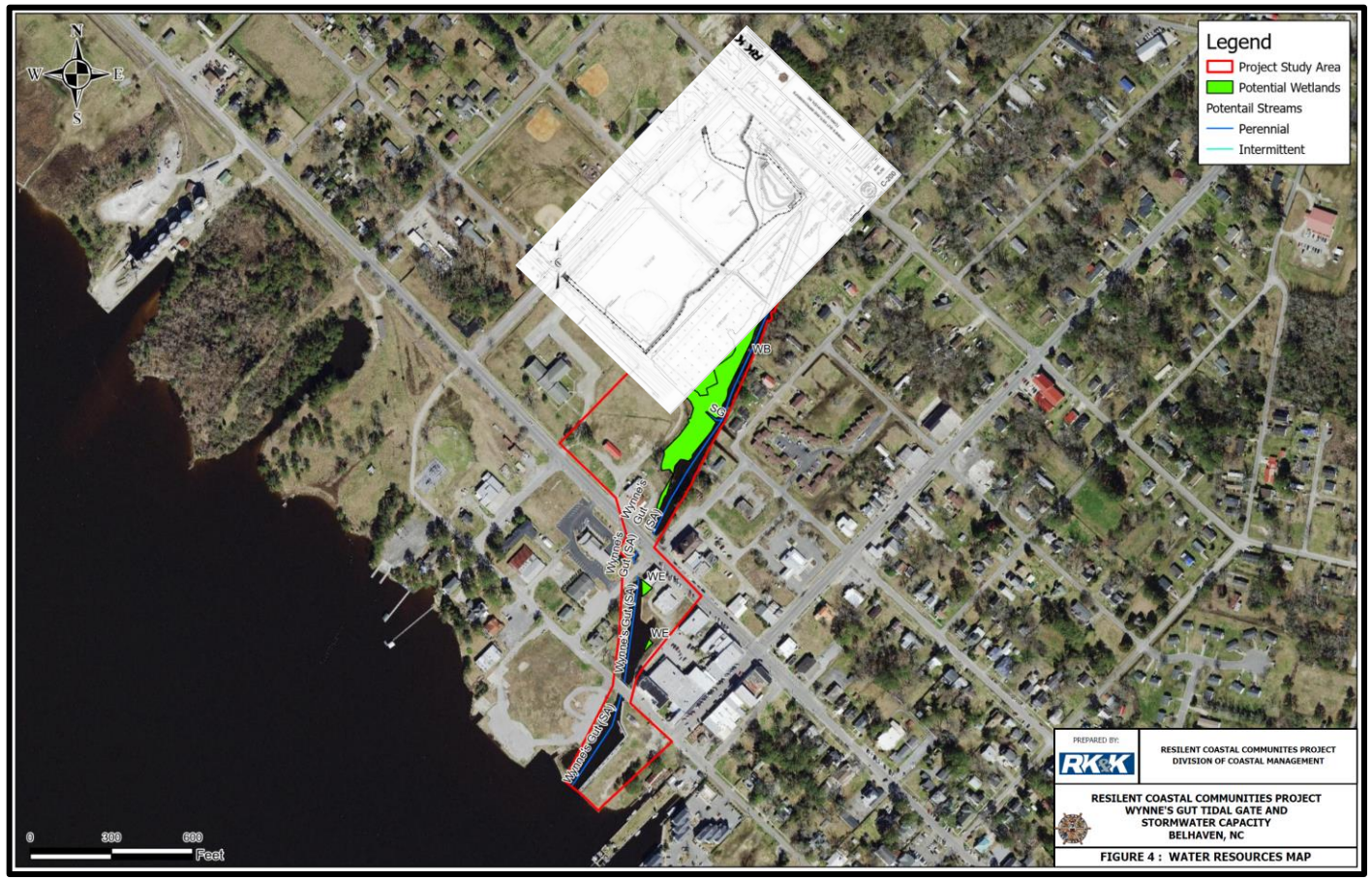
Phase 3 – Engineering & Design





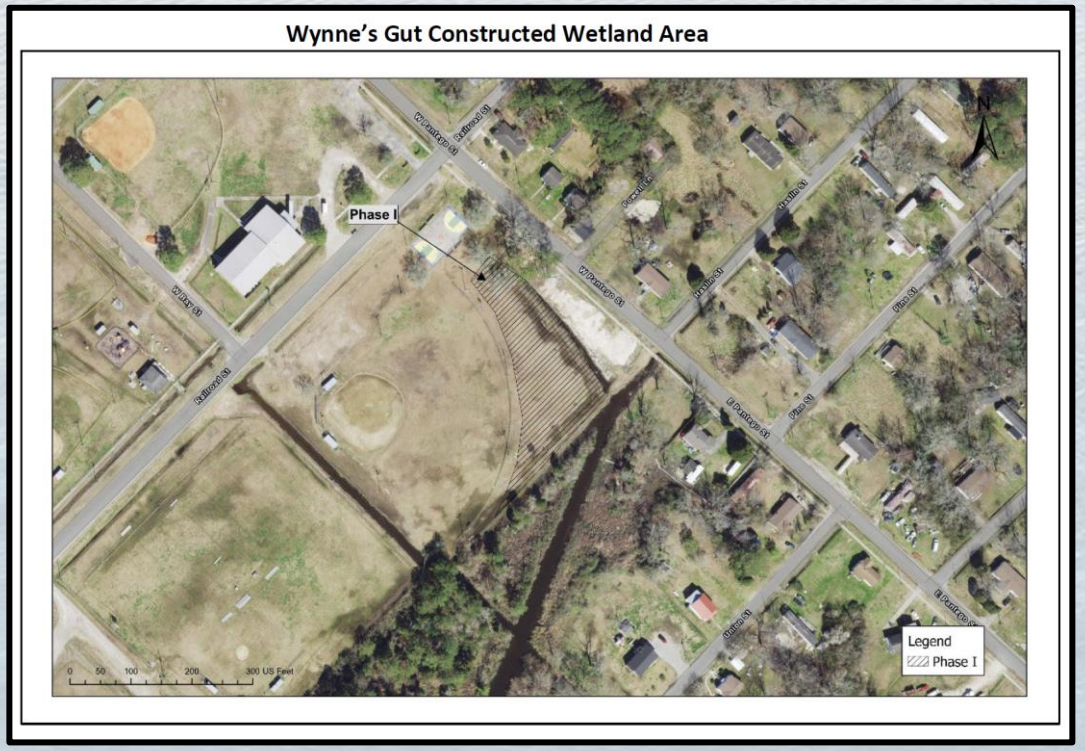
Phase 3 – Engineering & Design

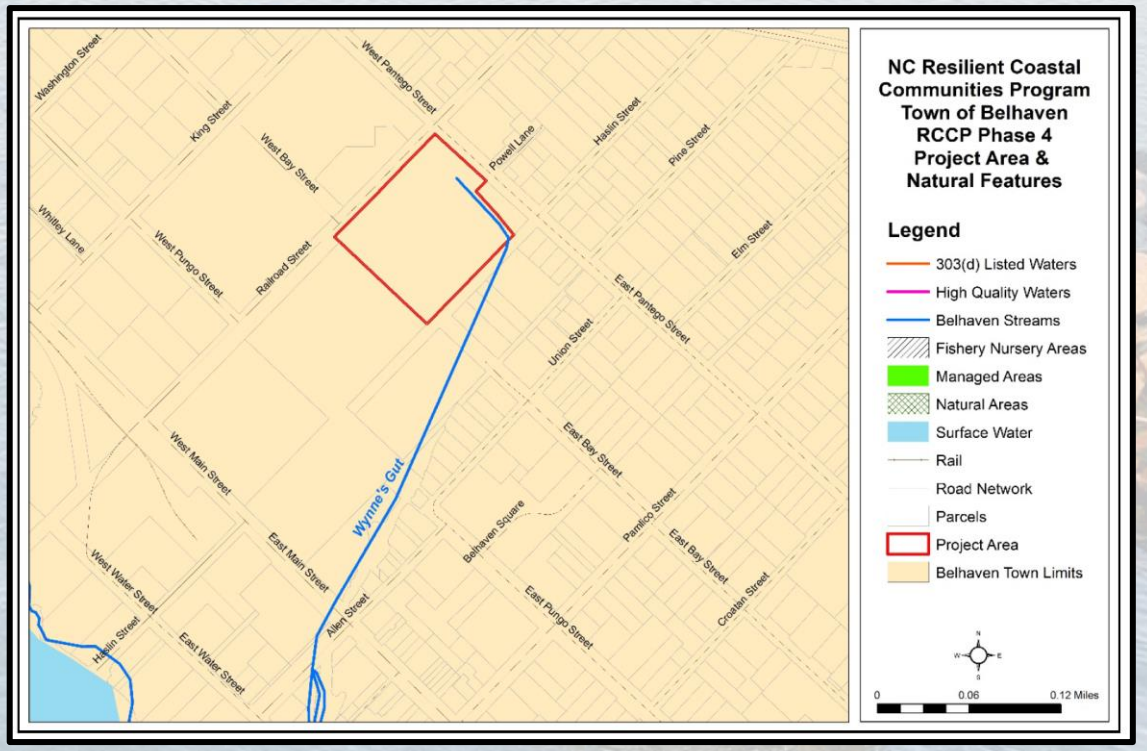




Phase 4 – Implementation

$263,200.00 Awarded for Implementation





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Questions?