

A photograph of a flooded street, likely after a hurricane. In the foreground, a small boat is partially submerged. The water covers the road and surrounding areas. In the background, several cars are visible, some partially submerged. The sky is overcast. The text "Hurricane Matthew Resilient Redevelopment Plan Northeast Region" is overlaid on the image in a large, white, sans-serif font.

Hurricane Matthew Resilient Redevelopment Plan Northeast Region

August 2017

Version 1.0

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Change Log

Version	Date	Summary of Changes

Executive Summary

In October 2016, Hurricane Matthew caused widespread destruction in the Caribbean and up the Eastern Seaboard of the United States. In North Carolina, at least 26 people lost their lives, and 100,000 homes, businesses, and government buildings sustained damage estimated at \$4.8 billion.¹ At the storm's peak, 3,744 individuals fled to 109 shelters across the region. More than 800,000 households lost power and 635 roads were closed, including the major east-west and north-south corridors.

In December 2016, the North Carolina General Assembly established the North Carolina Resilient Redevelopment Planning (NCRRP) program as part of the 2016 Disaster Recovery Act (*Session Law 2016-124*). The purpose of the program is to provide a roadmap for community rebuilding and revitalization assistance for the communities that were damaged by the hurricane. The program empowers communities to prepare locally driven recovery plans to identify redevelopment strategies, innovative reconstruction projects, and other needed actions to allow each community not only to survive but also to thrive in an era when natural hazards are increasing in severity and frequency.

The NCRRP consists of planning and implementation phases and is managed through North Carolina Emergency Management.



Figure 1. NCRRP Counties

As part of the NCRRP, NCEM facilitated development of regional resilient redevelopment plans for four “prosperity zones” as identified by the North Carolina Department of Commerce. Prosperity zones were created by the North Carolina General Assembly in 2015 for the following purposes:

- 1) Facilitate collaborative and coordinated planning and use of resources,
- 2) Improve cooperation with other governmental and nonprofit entities at the local and regional level,
- 3) Facilitate administrative efficiencies within State government,
- 4) Receive advice on economic development issues by local boards established by a North Carolina nonprofit corporation with which the Department of Commerce contracts, and
- 5) To the extent feasible, establish one-stop sources in each region for citizens and businesses seeking State services at the regional level.

¹ State of North Carolina Supplemental Request for Federal Assistance Hurricane Matthew Recovery, <https://governor-new.s3.amazonaws.com/s3fs-public/documents/files/Hurricane%20Matthew%20Relief--2017%20Federal%20Request%20%28002%29.pdf>.

All of the impacted counties² fall into one of the following four economic prosperity zones:

- North Central Region
- Northeast Region
- Southeast Region
- Sandhills Region

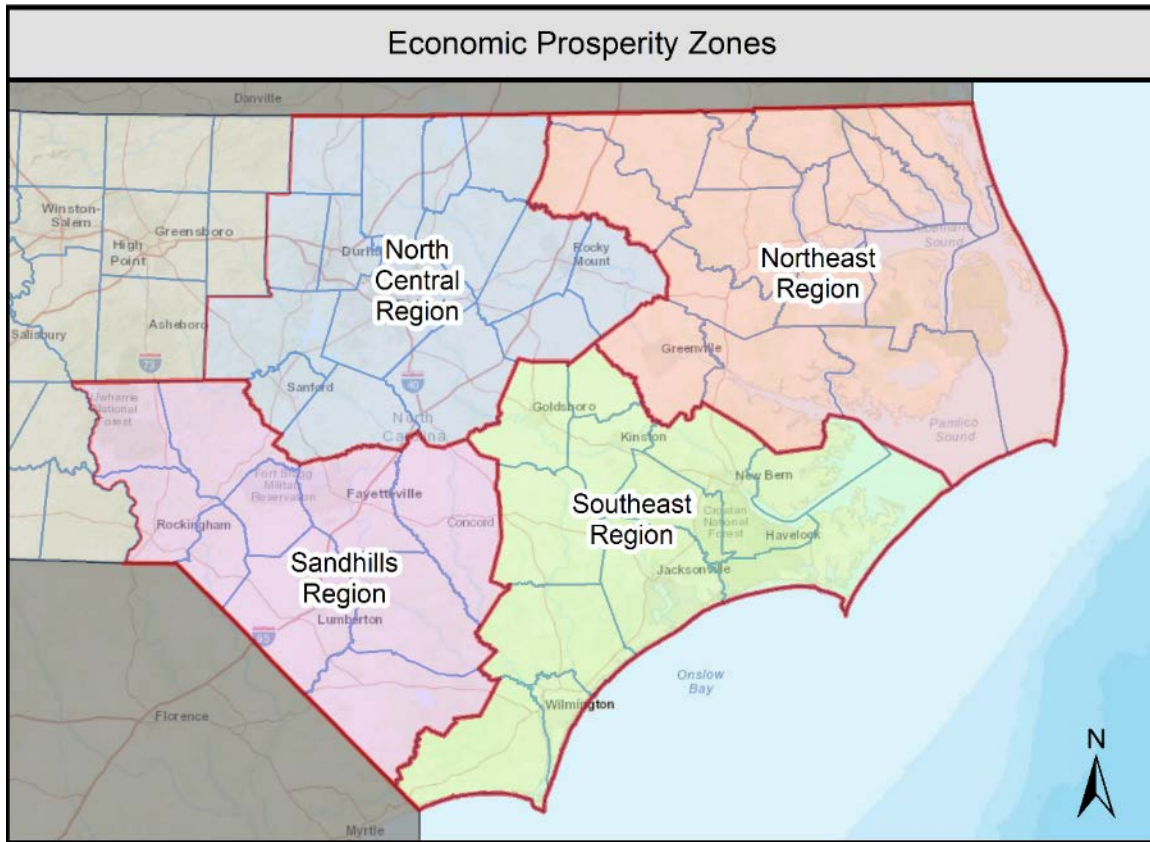


Figure 2. North Carolina Prosperity Zones

This document has been developed to provide summary information for the counties located in the Northeast Region. These summary documents provide a snapshot of the current needs of the counties located in these regions regarding holistic recovery and redevelopment. The plan will evolve as the counties analyze their risk to their assets, identify needs and opportunities, determine the potential costs and benefits of projects, and prioritize projects. As projects are more fully defined, the potential impact on neighboring communities and the region may lead to modifications.

Implementation of the proposed projects and actions described in this plan is subject to applicable federal, state, and local laws and regulations. Proposed projects or actions may be eligible for state or federal funding, or could be accomplished with municipal, nonprofit, or private investments. However, inclusion of a project or action in this plan does not guarantee that it will be eligible for recovery funding.

² Except for Anson County. Anson County is located in the Southwest Region Prosperity Zone but for the purposes of these reports has been included in the Sandhills Region.

This regional RRP covers the following counties:

- Beaufort
- Bertie
- Camden
- Chowan
- Currituck
- Dare
- Gates
- Halifax
- Hertford
- Hyde
- Martin
- Northampton
- Pasquotank
- Perquimans
- Pitt
- Tyrrell
- Washington

After multiple public meetings, the counties in this region identified 278 projects in four pillars: Housing, Economic Development, Infrastructure, and Environment. Details of these projects can be found in Section 4 of this plan.

County	Housing Pillar	Economic Development Pillar	Infrastructure Pillar	Environment Pillar	Total Project/Action Count
Beaufort	5	3	5	1	14
Bertie	2	7	13	3	25
Camden	8	2	4	6	20
Chowan	3	2	6	1	12
Currituck	3	3	6	4	16
Dare	1	4	20	3	28
Gates	2	0	4	1	7
Halifax	1	3	4	1	9
Hertford	1	2	9	0	12
Hyde	5	4	18	2	29
Martin	2	1	5	3	11
Northampton	0	1	10	0	11
Pasquotank	5	4	11	2	22
Perquimans	0	1	4	4	9
Pitt	3	2	16	1	22
Tyrrell	3	2	8	2	15
Washington	4	4	8	0	16
TOTAL	48	45	151	34	278

Table 1. Regional Summary of Projects



1. Background

1. Background

Summary of Hurricane Matthew Storm Damage

Hurricane Matthew was an extraordinarily severe and sustained event that brought record-level flooding to many areas in eastern North Carolina's coastal plain, sound, and coastal communities. Hurricane Matthew hit North Carolina on October 8, 2016, as a Category 1 storm. Communities were devastated by this slow-moving storm primarily by widespread rainfall. During a 36-hour period, up to 18 inches of heavy rainfall inundated areas in central and eastern North Carolina.

Riverine flooding began several days after Hurricane Matthew passed and lasted for more than 2 weeks. New rainfall records were set in 17 counties in the Tar, Cape Fear, Cashie, Lumber, and Neuse River watersheds. Entire towns were flooded as water levels throughout eastern North Carolina crested well beyond previously seen stages.

During the peak of the hurricane, 800,000 households lost power and 635 roads were closed, including a section of I-40 West in Johnston County that was closed for 7 days, and sections of I-95 North and South in Robeson and Cumberland Counties that were closed for 10 days.

Approximately 88,000 homes were damaged and 4,424 were completely destroyed. Losses totaled more than \$967 million, representing an economic loss as high as 68% of the damages, or \$659 million, not expected to be covered by insurance or FEMA assistance.

North Carolina Governor McCrory requested FEMA assistance on October 9, 2016, and FEMA subsequently declared a major disaster (DR-4285) for North Carolina on October 10, 2016, for 48 counties encompassing approximately 325 cities, towns, townships, and villages.

Preliminary estimates indicate more than 30,000 businesses suffered physical or economic damage, and 400,000 employees were affected as a result. Hurricane Matthew also had a significant impact on the agriculture and agribusiness economy in eastern North Carolina. The nearly 33,000 agricultural workers and 5,000 agricultural-support workers hit by the storm account for more than half of the state's agriculture and agriculture-support workforce.

Initial economic analysis of the impacts of crop and livestock losses caused by Hurricane Matthew estimated the loss of more than 1,200 jobs and roughly \$10 million in state and local income and sales tax revenue.³

State / Legislative Response

North Carolina's response to Hurricane Matthew included 2,300 swift-water rescues using 79 boats and more than 90 air rescues. North Carolina also deployed over 1,000 National Guard and State Highway Patrol to assist with rescue and sheltering missions. There were 3,744 individuals transported to 109 shelters across central and eastern North Carolina during the storm's peak.

FEMA's disaster declaration made 50 counties eligible for FEMA assistance, 45 of which are eligible for Individual Assistance and Public Assistance and 5 of which are eligible for Public Assistance only.

³ Governor McCrory's Request for Federal Assistance for Hurricane Matthew Recovery, November 14, 2016

- There were 81,832 individuals registered for FEMA/state assistance.
- Federal/state financial assistance in the amount of \$92.5 million was approved to help flood survivors recover.
- Small Business Administration (SBA) loans approved for individuals after Hurricane Matthew totaled \$65.6 million.
- SBA loans approved for businesses after Hurricane Matthew totaled \$23.2 million.

After the immediate response period, North Carolina Governor McCrory and the North Carolina General Assembly took the steps summarized below to obtain and allocate long-term funding for Hurricane Matthew.

November 1: The Hurricane Matthew Recovery Committee is established. Preliminary damage assessments are completed, and the State Emergency Response Task Force continues to administer programs and identify needs unmet by existing federal programs.

November 14: Governor McCrory formally submits North Carolina’s request for supplemental federal disaster assistance to the delegation as Congress returns to work.

Late November/Early December: Congress appropriates supplemental disaster assistance for North Carolina. After the supplemental federal disaster recovery assistance package is received, Governor McCrory submits a supplemental state disaster assistance package (House Bill 2) recommendation to the General Assembly and calls a special session. Governor McCrory then signs the Hurricane Matthew Recovery Act to fund disaster recovery efforts.

This supplemental federal assistance was to focus on housing, infrastructure, economic development, and the environment. These four pillars were to be funded through the following programs and agencies: The U.S. Department of Housing and Urban Development’s Community Development Block Grant–Disaster Recovery (CDBG-DR) program, Army Corps of Engineers Operations and Maintenance, the FEMA National Dam Safety Program, the Federal Highway Administration’s Emergency Highway Funding, and the U.S. Department of Agriculture’s Emergency Conservation and Watershed Protection programs.

Resilient Redevelopment Planning

The purpose of the NCRRP program is to provide a roadmap for communities in eastern North Carolina to rebuild and revitalize after being damaged by Hurricane Matthew. The program empowers communities to prepare locally driven, resilient redevelopment plans to identify redevelopment strategies, innovative reconstruction projects, and other actions to allow each community not only to survive, but also to thrive in an era when natural hazards are increasing in severity and frequency.

The NCRRP process employs a holistic approach to planning that includes four pillars: housing, infrastructure, economic development, and the environment. Redevelopment strategies and reconstruction projects for each of the four pillars is included in each plan.

The NCRRP process consists of planning and implementation phases and is managed through North Carolina Emergency Management (NCEM).

Scope

This document is a snapshot of the Northeast Economic Property Zone’s current needs for achieving holistic recovery and redevelopment. The plan will evolve as the counties in the region analyze the risk to their assets, identify needs and opportunities, determine the potential costs and benefits of projects, and prioritize the projects. As projects are more fully defined, the potential impact on neighboring communities and the region may lead to modifications.

Planning objectives are to (1) develop strategic, resilient redevelopment plans and actions, and (2) to define any unmet funding needed to implement such actions after considering other funding sources.

The resulting resilient redevelopment plans will be the foundation for any supplemental funding received through Congress, the North Carolina General Assembly, and other funding sources. These plans will also be the basis for the state’s Recovery Action Plan, which is required by the U.S. Department of Housing and Urban Development before the state can expend funds received from the CDBG-DR program.

Local Participation and Public Engagement

Stakeholder engagement and public involvement was an essential component of the NCRRP initiative. In each participating County, four rounds of discovery, analysis, collaboration, and interaction were held. Each meeting had two components: an in-depth working session with county officials, subject matter experts, and planners from the affective counties and municipalities; and a public open house. The purpose of each meeting was as follows:

Meeting 1 – Initiated the planning process and validated the existing data pertaining to damage and impacts.

Meeting 2 – NCEM presented draft documentation of resilient redevelopment strategies and received feedback from community leaders and the public.

Meeting 3 – NCEM presented refined resilient redevelopment strategies based on feedback from Meeting 2 and received additional feedback for finalization of the plan.

Meeting 4 – NCEM presented actions developed during the course of the planning process and allowed the county to rank actions; apply High, Medium, or Low Prioritization; and approve inclusion of the actions in the final plan.

Each of the 50 counties that were declared a major disaster by the President of the United States as a result of Hurricane Matthew under the Stafford Act (P.L. 93-288) participated in the resilience redevelopment planning process. Each municipality in those counties, as well as the four economic development regions that sustained damage from Hurricane Matthew, were also invited to participate.

The counties impacted by the storm cover the eastern half of North Carolina and occupy parts of the piedmont, sand hills, and coastal areas of the state.

Assumptions and Methodologies

NCEM has assembled a wealth of data, resources, and technical expertise from state agencies, the private sector, and the University of North Carolina system to support the development of innovative best practice strategies.

Implementation of the proposed projects and actions described in this plan is subject to applicable federal, state, and local laws and regulations. Inclusion of a pro in this plan does not guarantee that it will be eligible for recovery funding. However, proposed projects or actions may be eligible for state or federal funding or could be accomplished with municipal, nonprofit, or private investment.



2. Regional Profile

2. Regional Profile

The Northeast Economic Prosperity Zone is comprised of the counties of Beaufort, Bertie, Camden, Chowan, Currituck, Dare, Gates, Halifax, Hertford, Hyde, Martin, Northampton, Pasquotank, Perquimans, Pitt, Tyrrell, and Washington. All of these 17 counties were part of the Presidential disaster declaration. This section provides a summary of demographics, income, housing, economy, infrastructure and environment of the impacted counties within this region. The County level plans have more detailed information.

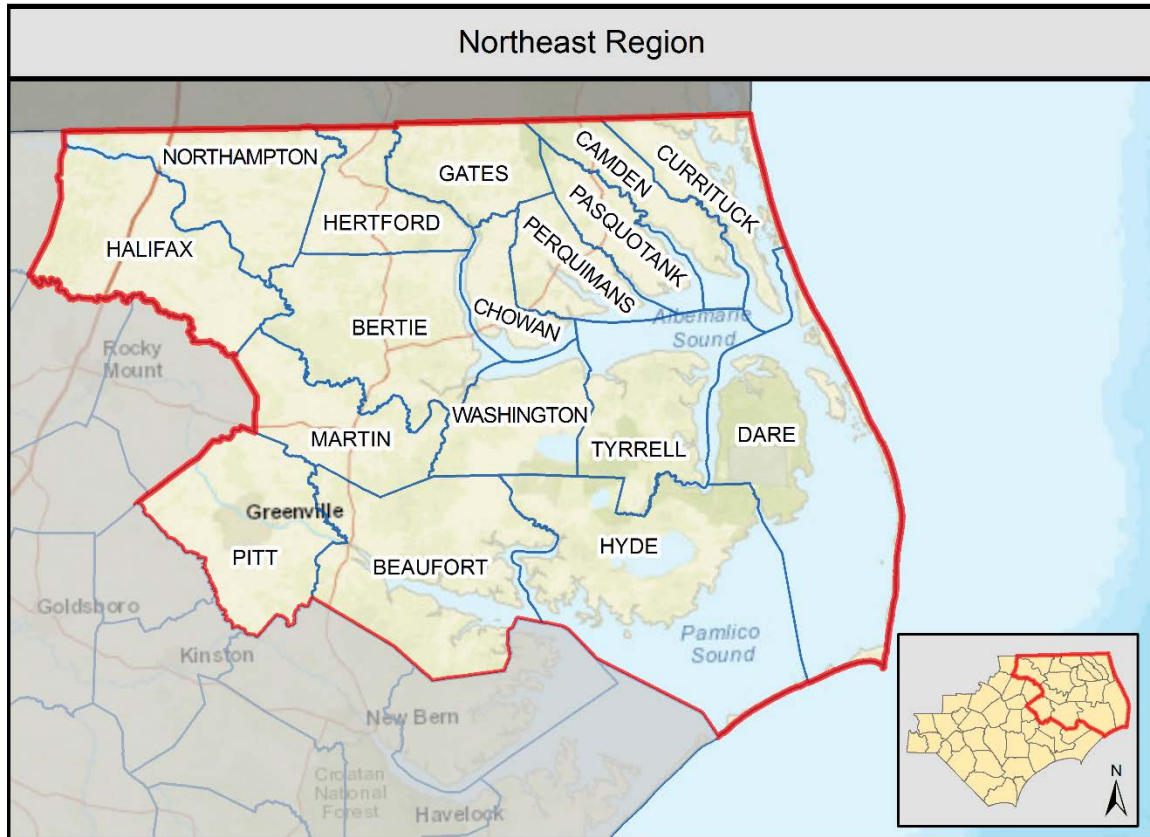


Figure 3. Northeast Prosperity Zone

Demographics, Income, and Housing

Demographic, income and housing information for the region is summarized by county in Table 2. The data is from the 2000 Census, 2010 Census, and 2011-2015 American Community Survey five-year estimates.

Table 2. County Summary of Demographics, Income and Housing

County	Population (2010)	Population Change in between 2000 & 2010 (%)	Median Age (5-year estimate 2011-2015)	Low, Moderate and Medium Income (% of population (2006-2010))	Affordable Housing Units (#) (2016)	Zero-Car Households (% of households 5-year estimate 2011-2015)
Beaufort	47,759	6.2%	44.9	41.2%	1,692	5.3%
Bertie	21,282	7.6%	44.8	34.9%	482	12.2%
Camden	9,980	45.0%	41.1	38.7%	7	6.5%
Chowan	14,793	1.8%	44.5	47.2%	565	5.1%
Currituck	23,547	29.5%	42.6	36.8%	51	4.7%
Dare	33,920	13.2%	45	37.1%	143	6.6%
Gates	12,197	16.0%	43.2	41.9%	7	8.2%
Halifax	54,691	-4.7%	42.1	39.4%	1,850	4.4%
Hertford	24,669	9.2%	41.7	32.0%	675	9.8%
Hyde	5,810	-0.3%	43	38.1%	71	9.5%
Martin	24,505	-4.3%	46	38.3%	878	5.5%
Northampton	22,099	0.1%	47.1	41.7%	484	6.5%
Pasquotank	40,661	16.5%	37.4	38.9%	1,301	5.3%
Perquimans	13,453	18.3%	47.8	41.2%	341	12.2%
Pitt	168,148	25.7%	31.5	34.9%	4,138	6.5%
Tyrrell	4,407	6.2%	44.4	38.7%	75	5.1%
Washington	13,228	-3.6%	45.1	47.2%	571	4.7%
Region	535,149	10.7%	43.1	36.8%	13,331	6.6%
North Carolina	9,535,483	18.5%	42	55%	156,964	8.2%

Sources : Population - Minnesota Population Center. National Historical Geographic Information System: Version 11.0 [Database]. Minneapolis: University of Minnesota. 2016. <http://doi.org/10.18128/D050.V11.0>. Census 2000/Census 2010 Time Series Tables Geographically Standardized
 Age - US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B01001, "Sex by Age."
 Low, Moderate and Medium Income - based on the 2006-2010 American Community Survey (ACS) - <https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-block-groups-places/>
 Affordable Housing - Public and Affordable Housing Research Corporation and National Low Income Housing Coalition, National Housing Preservation Database, 2016. <http://www.preservationdatabase.org/>
 Zero-Car Households - US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B25044, "Tenure by Vehicles Available."

In terms of population, the region is growing at a lower rate (10.7%) than the State (18.5%). Camden, Currituck and Pitt counties have the highest growth rate, while population is declining in Halifax, Washington, Martin, and Hyde counties. Median age of the region (43.1) is comparable to the State's (42).

The American Community Survey (ACS) 5-year 2006-2010 Low and Moderate Income Summary Data from the Housing and Urban Development Exchange (HUD Exchange) website shows that the region has a lower Low, Moderate, and Medium Income (LMMI) population proportion (36.8%) than the State (55%).

According to the National Housing Preservation Database, Camden and Gates counties have a very low number of affordable housing units (7). Census data on zero-car households shows that Bertie and Perquimans counties have a high percentage of households that do not have a car (12.2%), relative to the rest of the region, and would need assistance in case of evacuation.

Economy and Labor Force

Table 3 shows each county's civilian population in the labor force and the proportion of that population that is unemployed. According to the local area unemployment statistics (LAUS) from the Labor and Economic Analysis Division (LEAD) for the unadjusted data for all periods in 2016, the Northeast region has a higher average annual unemployment rate (6.7%) than the State's (5.1%), with Hyde, Tyrrell, and Halifax being the counties with the highest unemployment rates in the region.

Table 3. County Summary of Unemployment and Top Employers

County	Civilian Population in Labor Force (2016)	Civilian Unemployment Rate (2016)	Top Employer (Second Quarter, 2016)	Top Employer's Industry Sector (Second Quarter, 2016)
Beaufort	20,429	5.7%	Beaufort County Schools	Education and Health Services
Bertie	8,537	6.7%	Perdue Products Incorporated	Manufacturing
Camden	4,636	5.3%	Camden County Board of Education	Education and Health Services
Chowan	5,648	6.4%	Edenton-Chowan Schools	Education and Health Services
Currituck	12,941	5.2%	Currituck County Board of Education	Education and Health Services
Dare	20,069	7.0%	Dare County Schools	Education and Health Services
Gates	5,193	5.2%	Gates County Board of Education	Education and Health Services
Halifax	20,806	8.0%	Halifax Regional Medical Center	Education and Health Services
Hertford	9,388	6.5%	Vidant Medical Center	Education and Health Services
Hyde	2,136	9.6%	Hyde County Board of Education	Education and Health Services
Martin	9,889	6.7%	Martin County Board of Education	Education and Health Services
Northampton	7,924	7.3%	Lowes Home Centers Inc	Trade, Transportation, & Utilities
Pasquotank	17,468	6.3%	Pasquotank County Board of Education	Education and Health Services
Perquimans	5,166	6.4%	Perquimans County Schools	Education and Health Services
Pitt	88,381	5.5%	East Carolina University	Education and Health Services
Tyrrell	1,519	8.6%	Whitecap Linen	Other Services
Washington	4,921	7.4%	Domtar Paper Company LLC	Manufacturing
Region	245,051	6.7%		
North Carolina	4,875,702	5.1%		

Sources: Civilian Population and Unemployment Rate - Labor and Economic Division of North Carolina Department of Commerce – Local Area Unemployment Statistics <http://d4.nccommerce.com/LausSelection.aspx>

Top Employer - Labor and Economic Division of North Carolina Department of Commerce – Quarterly Census of Employment and Wages (QCEW) Largest Employers <http://d4.nccommerce.com/QCEWLargestEmployers.aspx>

The table also includes the largest employer in each county, with the corresponding industry, which shows that education and health services, public administration, manufacturing, and leisure and hospitality are the major industries in the region. The source of employer data is the Labor and Economic Analysis Division (LEAD) of the North Carolina Department of Commerce.

Infrastructure and Environment

Major transportation infrastructure includes I-95, which cuts across Halifax County in the northwestern corner of the region. US route 17 and 13 are the major north-south highways, and US route 64 is the major east-west highway across the region. Dare County has two airports, and Hertford, Martin, Chowan, Pitt, and Pasquotank counties have one each.

Power supply to the region is through major utility companies, and supplemented by solar farms and wind energy farms located in most of the counties in the region (Beaufort, Bertie, Camden, Chowan, Currituck, Halifax, Hertford, Martin, Northampton, Pasquotank, Perquimans, Pitt, and Washington).

Majority of the water and wastewater facilities are managed by public water and sewer districts. There are a few independent entities like the South Mills Water Association (serving portions of Camden and Pasquotank), or municipal water systems, and a small population has wells. Chowan and Gates counties do not have a wastewater treatment system and rely on private systems and septic tanks. Currituck County has 13 private entities providing service to individual developments or neighborhoods.

Educational and medical facilities are spread throughout the region. Notable regionally important ones are East Carolina University, located in Greenville, which is the third-largest university in North Carolina, and Vidant Medical Group, a multi-specialty physician group with hospitals in Beaufort, Bertie, Chowan, and Hertford counties in addition to several facilities in the Outer Banks. The Vidant Medical Center in Greenville is the third largest Level I Trauma Center in the nation.

Figures 4 and 5 show the major infrastructure in the region.

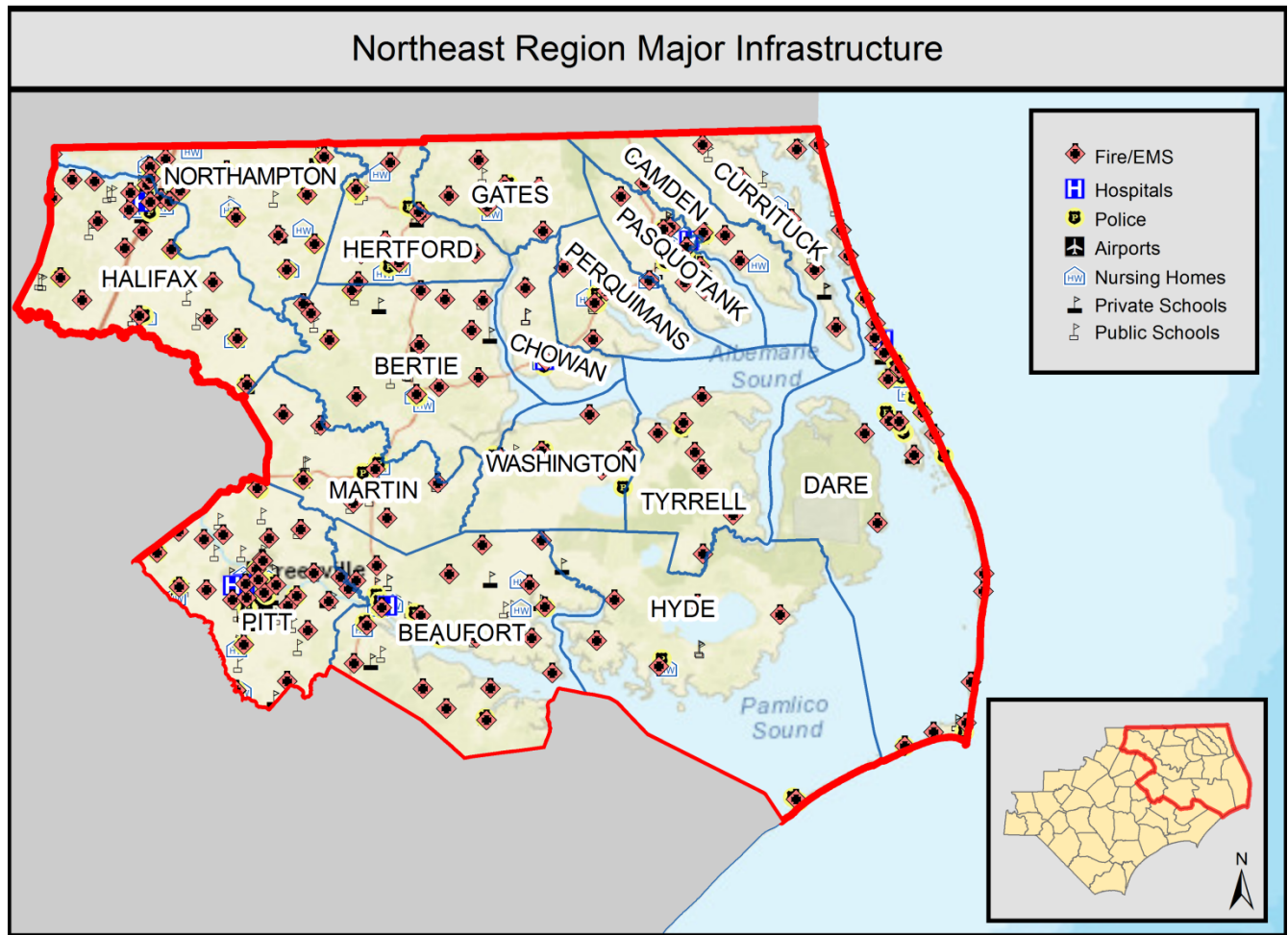


Figure 4. Major Infrastructure in the Northeast region – 1 of 2 maps

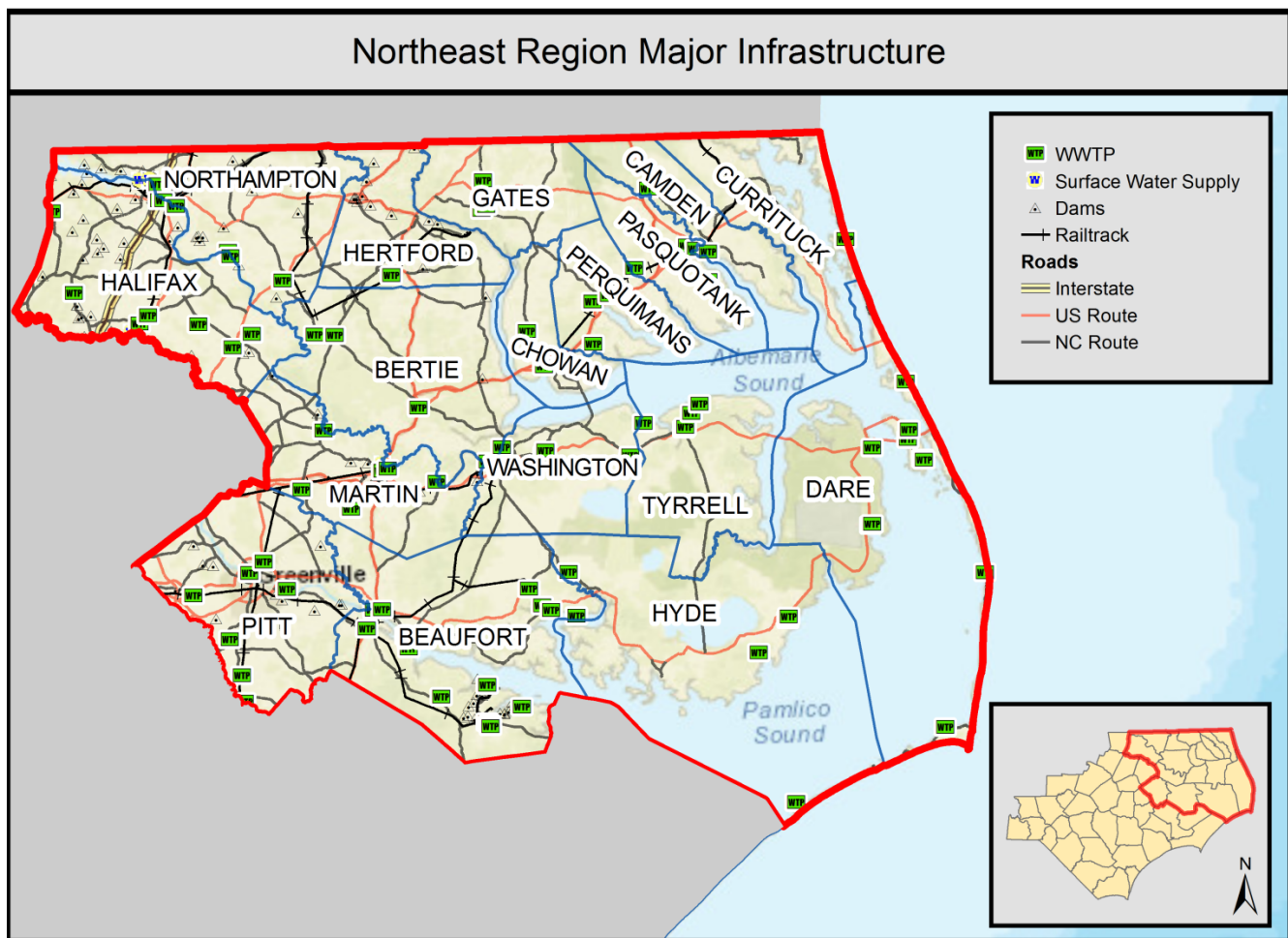


Figure 5. Major Infrastructure in the Northeast Region - 2 of 2 maps

The region is home to the famous Outer Banks islands, located in Dare and Hyde counties. According to the NC Natural Heritage Program, there are a number of natural areas of high, very high, or exceptional value in the region, and are designated as protected lands and natural heritage areas. The Great Dismal Swamp National Wildlife Refuge and the Great Dismal Swamp State Park are in the northeastern part of the region (Camden, Pasquotank, and Gates counties), the Roanoke River National Wildlife Refuge is in the central part of the region (Bertie county), the Alligator River National Wildlife Refuge is in the east (Dare and Hyde counties), the Pocosin Lakes National Wildlife Refuge is in Tyrrell county, and the Swan Quarter National Wildlife Refuge, Cape Hatteras National Seashore and Mattamuskeet National Wildlife Refuge are federally managed natural areas in the southeastern part of the region (Hyde county).

An aerial photograph showing a residential neighborhood severely impacted by flooding. The water is a murky, brownish-yellow color, submerging large areas of the landscape. In the upper half of the image, a large body of water has inundated a wooded area, with only the tops of many trees visible. Below this, a residential street with several houses is shown. The houses are mostly two-story structures with light-colored siding and dark roofs. Some houses have their lower levels submerged in water. The surrounding area is a mix of green trees and flooded lawns. The overall scene depicts significant storm damage and flooding in a suburban setting.

3. Storm Impact

3. Storm Impact

Rainfall Summary

Hurricane Matthew officially made landfall as a Category 1 storm southeast of McClellanville, South Carolina early on October 8, 2016. The track and speed of the storm resulted in nearly two days of heavy precipitation over much of North Carolina that caused major flooding in parts of the eastern Piedmont and Coastal Plain. The storm produced widespread rainfall of 3-8 inches in the central regions of North Carolina and 8 to more than 15 inches in parts of eastern North Carolina. A number of locations received all-time record, one-day rainfall amounts. Many locations in the Coastal Plain of North Carolina had received above normal rainfall in the month of September leading to wet antecedent conditions prior to Hurricane Matthew. Total rainfall depth for Northeast region is highlighted graphically in the figure below.

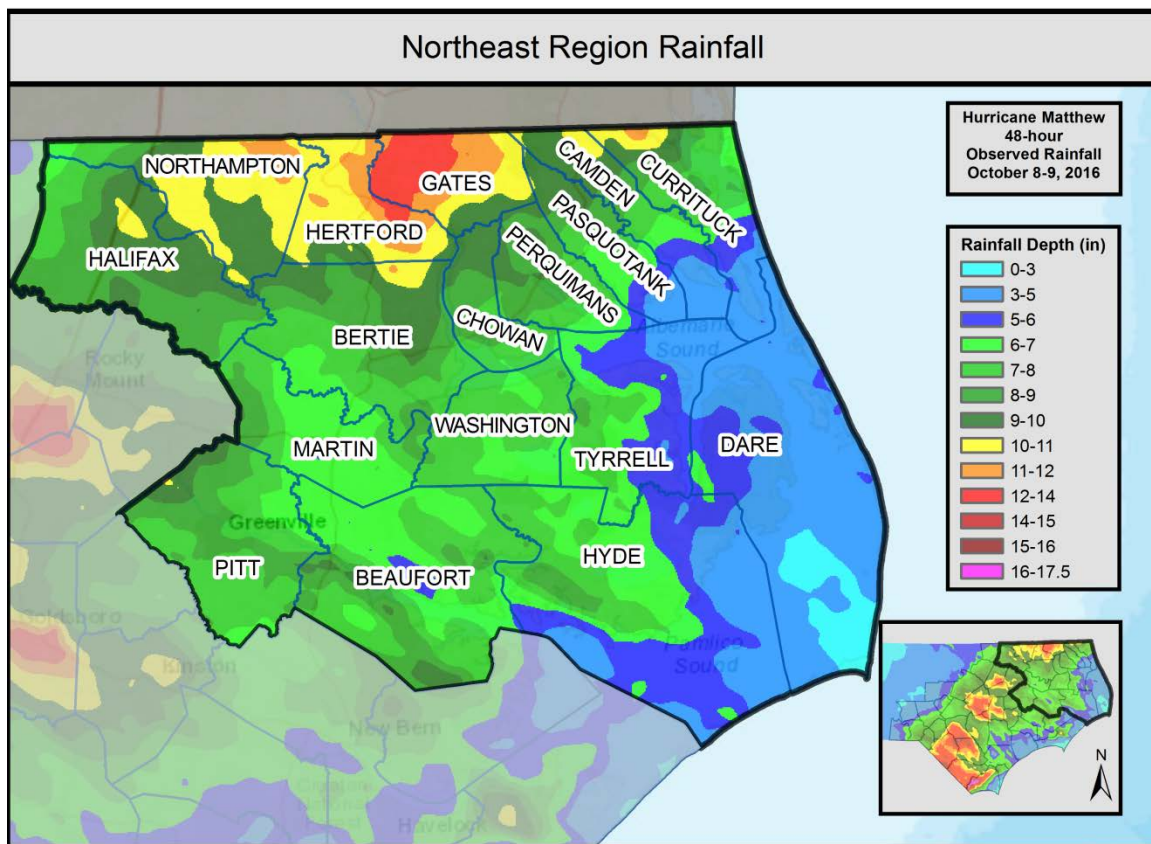


Figure 6. 48-hour Observed Rainfall Depth (October 8-9, 2016)

Housing and Infrastructure Impacts

According to Individual Assistance (IA) claims information as of July 2017, there were 9,870 impacted houses in the Northeast region because of Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew might still be pending, so this number may not reflect the final claims data from the event.

According to Public Assistance (PA) claims information, which are often closely tied to infrastructure, as of May 2017 there were 62 submitted projects and \$1,899,593 of federal share obligated in the Northeast region as a

result of Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew might still be pending, so this number may not reflect the final claims data from the event.

Table 4 lists IA and PA claims as of July 2017.

County	Individual Assistance		Public Assistance	
	Total Registrations	Total Individual & Households Program (IHP) \$ Approved	Submitted Projects	Federal Shares Obligated
Beaufort	698	\$567,353	1	\$17,238
Bertie	1,030	\$920,662	6	\$431,434
Camden	202	\$265,349	2	\$175,686
Chowan	211	\$116,111	1	\$30,596
Currituck	321	\$271,864	3	\$144,390
Dare	1,126	\$1,377,764	11	\$339,479
Gates	160	\$200,882	0	\$0
Halifax	491	\$381,035	8	\$72,588
Hertford	455	\$319,057	1	\$123,258
Hyde	196	\$117,747	0	\$0
Martin	213	\$178,407	8	\$130,345
Northampton	252	\$177,869	4	\$35,917
Pasquotank	481	\$306,935	2	\$125,777
Perquimans	109	\$53,781	2	\$68,620
Pitt	3,313	\$2,369,821	5	\$134,867
Tyrrell	288	\$290,979	0	\$0
Washington	324	\$207,300	8	\$69,398
Region	9,870	\$8,122,916	62	\$1,899,593
North Carolina	81,498	\$97,585,240	718	\$62,663,672

Table 4. County Summary of IA and PA Claims

The highest number of IA claims in the region is for Pitt County with 3,313 claims. The highest number of PA submitted projects is for Dare County with 11 projects; however, the largest federal share obligated is for Bertie County with \$431,434.

Infrastructure was one of the greatest areas of concern in the wake of Hurricane Matthew as there were several types of infrastructure that were damaged in multiple locations. Road closures were the major impacts identified by local officials; a map of road impacts in the region is included.

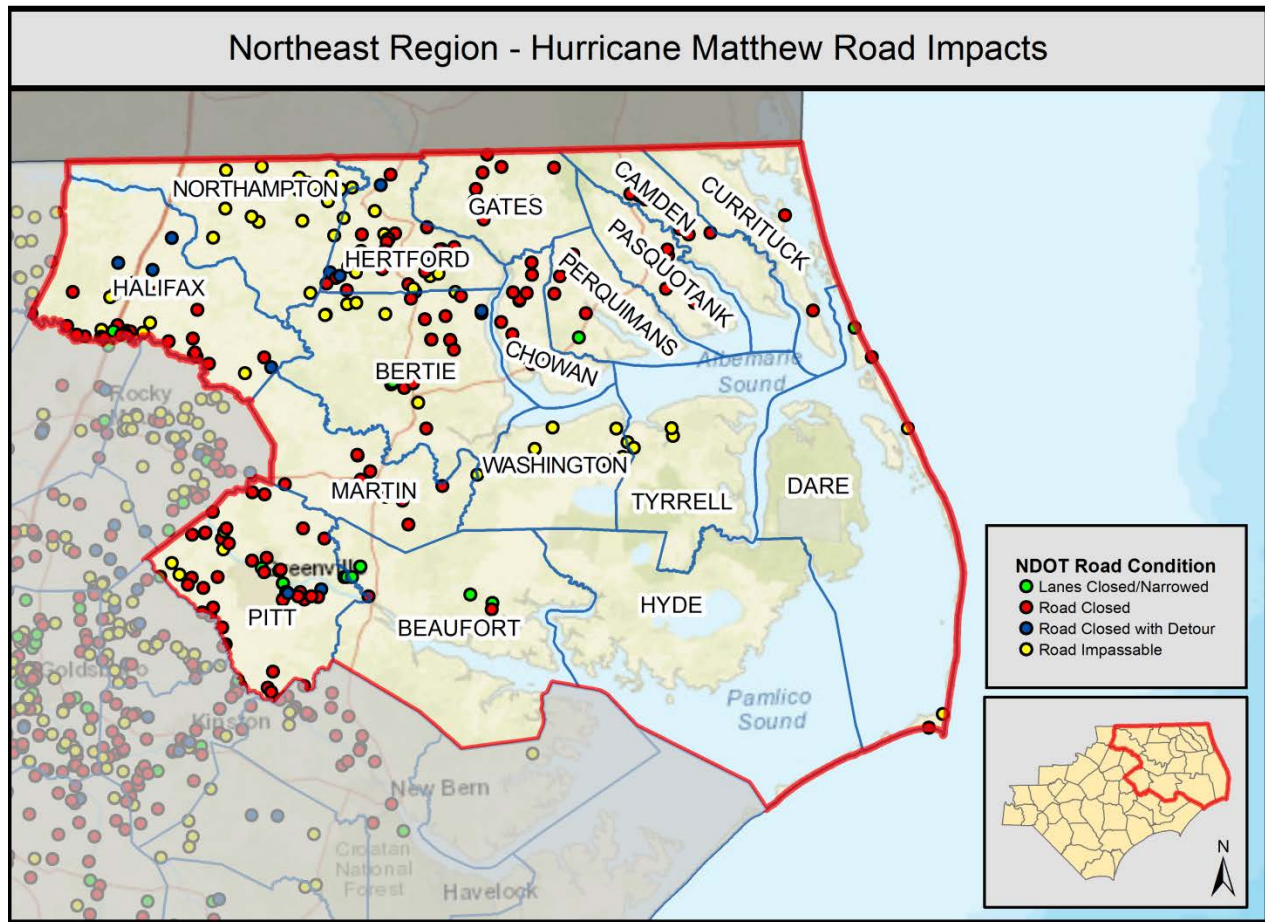


Figure 7. Regional Road Impacts

The County level plans have more detailed information about impacts to the local economy and environment.

An aerial photograph showing a residential neighborhood severely affected by flooding. The water is a murky, brownish-yellow color, covering large areas of the landscape. Several houses with grey roofs are visible, some partially submerged. A network of roads and streets crisscrosses the area, with some sections completely underwater. Large green trees are scattered throughout, many of which are isolated in the floodwater. The overall scene depicts a significant natural disaster impact on a community.

4. Strategies for Resilient Redevelopment

4. Strategies for Resilient Redevelopment

This section provides details about the resilience and revitalization strategies and actions identified in the Northeast Prosperity Zone that are regional in nature or that require coordination across jurisdictional boundaries. These actions were identified and refined during four public meetings with local officials and county residents held in March and April 2017. The actions are tied to impacts from Hurricane Matthew and organized by the pillars of housing, economic development, infrastructure, and environment. In addition to the public meetings, frequent coordination calls with County officials and data gathered from state agencies and organizations were utilized to formulate the actions listed below.

The table below provides the total number of regional resilience strategies that have been developed in the Northeast Region under each pillar.

Pillar	Number of Projects in the Region	Number of Regional Projects
Housing	48	0
Economic Development	40	3
Infrastructure	151	5
Environment	34	3
Grand Total	278	10

Table 5. Summary of Regional Projects by Pillar

The following table lists all the regional actions for the Northeast Prosperity Zone organized by project type.

Project Type	Number of Projects in the Region	Number of Regional Projects	Regional Project Name(s)
Agriculture related facilities and infrastructure	0	-	
All other non-hazard mitigation/recovery projects	36	-	
Dams and Levee Repairs and Improvement	3	-	
Economic Development/Environment/Energy (3Es)	21	1	<ul style="list-style-type: none"> • Martin County Environment Action 1: Delineation of Environmentally Sensitive and High Hazard Areas
Mitigation for Damaged Homes-Acquisition/Reloc	9	-	
Mitigation for Damaged Homes-Elevation/Recon	22	-	
Mitigation for Damaged Homes-Minor Repairs	4	-	
Mitigation for Public/Business Buildings	15	-	
Stormwater Management/Other Flood Mitigation	94	3	<ul style="list-style-type: none"> • Martin County Infrastructure Action 1: Debris Removal and Rehabilitation of Drainage Channels and Waterways • Pitt County Infrastructure Action 11: Installation of new River Gauges • Dare County Economic Development Action 2: Waterways Maintenance and Dredging
Studies and all other recovery activities	30	4	<ul style="list-style-type: none"> • Dare County Infrastructure Action 1: County Comprehensive Stormwater Management Plan

Project Type	Number of Projects in the Region	Number of Regional Projects	Regional Project Name(s)
			<ul style="list-style-type: none"> • Currituck County Economic Development Action 2: NC 12 Feasibility Study • Camden County Environment Action 1: US 158 Drainage Study (Phase I) • Camden County Infrastructure Action 1: Camden Causeway/US 158 Feasibility Study
Temp/Affordable Housing Construction outside SFHA	4	-	
Transportation Infrastructure	14	2	<ul style="list-style-type: none"> • Camden County Environment Action 2: US 158 Drainage Improvements (Phase II) • Bertie County Infrastructure Tier 2 Action 5: Salmon Creek Bridge
Waste Water & Water System Repairs & Hardening	26	-	
TOTAL	278	10	

Table 6. Regional Projects

Detailed information about the regional projects listed above is included on the following pages.

Martin County Environmental Action 1 - Delineation of Environmentally Sensitive and High Hazard Areas

County: Martin

Priority Grouping: Low Priority

Priority Ranking: 11

Project Timeframe: 1 year

Location: Martin County

Project Summary: The delineation of environmentally sensitive and high hazard areas that are unsuitable for growth will facilitate future land use planning. Directing growth away from these sensitive areas will create a buffer between development and sensitive natural resources, including any waterways contained therein.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project would reduce flooding by making use of the natural flood control capacity of environmentally sensitive areas (such as wetlands) in the County.	N/A
Consistent with existing plans (describe points of intersection/departure)	Delineating environmentally sensitive areas will potentially allow the County to implement projects and utilize funding through the Clean Water Management Trust Fund (CWMTF).	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Increasing the amount of usable greenway and blueway area in the County could invite more tourism and increase spending in the local economy.	Agree
Explain any benefits or impacts to the economy of the county from this project.	Increasing the amount of usable greenway and blueway area in the County could invite more tourism and increase spending in the local economy.	Agree
For how long will this solution be effective?	Between 11 and 30 years	Agree
How effective is the risk reduction?	Unknown	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	Yes	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Less than 25%	Agree
What impacts to the environment of the county will result from this project?	Identifying and delineating these areas to prevent their development would preserve and protect flood control features.	N/A
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$51K - \$100K	Agree
What is the level of public support for this project?	Medium	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

Martin County Infrastructure Action 1 - Debris Removal and Rehabilitation of Drainage Channels and Waterways

County: Martin

Priority Grouping: High Priority

Priority Ranking: 1

Project Timeframe: 1 year

Location: Martin County

Project Summary: Many waterways throughout the County are so full of debris that boats and water commerce cannot get in or out of the areas necessary to continue business. Additionally, areas of drainage ditch throughout the County are clogged with debris and therefore force water on to major roadways throughout the area. Drainage ditches, waterways, and watersheds will be dredged and cleared of debris and obstruction left in the wake of Hurricane Matthew. Ditches will also be widened or made more conducive to the clear passing of stormwater. Specific areas of concern are: Gardners Creek, Sweetwater Creek, Smithwick Creek, Welches Creek, Yerrell Creek, Flat Swamp Creek.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Many roadways and residential areas are affected by floodwaters as a result of debris remaining in stormwater drainage ditches following Hurricane Matthew. Continued clearing and removal of debris will allow the drainage areas to act as they are supposed to allowing the area to recover from Hurricane Matthew's impacts and creating resiliency against damage from future rain events.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Clearing of drainage areas will reduce repetitive flooding across roadways therefore increasing the ability of commerce and agricultural movement throughout Martin County and surrounding counties.	Agree
For how long will this solution be effective?	Less than 10 years	Agree
How effective is the risk reduction?	<50 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	Yes	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	Agree
What impacts to the environment of the county will result from this project?	Removing debris from drainage ditches within the County will help alleviate areas of stagnant standing water that can serve as mosquito breeding areas creating a vector concern for local people pets and livestock.	N/A
What is the capability of the local government to administer this project?	Medium	Agree

What is the financial range of this project?	\$1M+	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Between 26 and 50%	Agree
Who will administer this project?	County	Agree

Pitt County Infrastructure Action 11: Installation of new River Gauges

County: Pitt

Priority Grouping: Medium Priority

Priority Ranking: 8

Project Timeframe: 6 months

Location: Crossing of NC-222 over Tar River

Project Summary: Installation of a River Gauge at NC-222 Bridge on Tar River: Installing a gauge will provide officials and emergency response personnel with more advanced warning about potential flooding.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew more comprehensive stream height data could have allowed for more informed decision making by officials and first responders within Pitt County. Damage from future storms would therefore be mitigated by the addition of a stream gauge on the Tar River.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Increased advance warning for rising flood waters gives business owners more time to prepare for flood impacts. This could minimize the amount of economic damage the floods inflict on the County.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	Unknown	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	0	Agree
Is coordination with other communities/counties needed to complete this project?	Yes	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Unknown	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	No adverse impacts expected.	N/A
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$101K - \$250K	Agree
What is the level of public support for this project?	Medium	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

Dare County Economic Development Action 2: Waterways Maintenance and Dredging

County: Dare

Priority Grouping: High Priority

Priority Ranking: 6

Project Timeframe: 1 year plus on-going thereafter as needed

Location: Waterway Maintenance and Dredging - Wanchese Seafood Industrial Park, Hatteras and Oregon inlets

Project Summary: Dredge waterways and inlets to maintain appropriate pre-storm depth and width would minimize the impacts storm events may bring and allow quicker repairs.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Lack of maintenance of critical waterways impacts areas businesses by force longer periods of shut-down following storm events in order to dredge/clear waterways.	N/A
Consistent with existing plans (describe points of intersection/departure)	Albemarle Regional Hazard Mitigation Plan Dare County Land Use Policies for Hazard Mitigation NCDOT CTP importance	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Would decrease displacement of industry jobs allowing protection of jobs and increase in revenue immediately following storms.	Agree
For how long will this solution be effective?	Less than 10 years	Agree
How effective is the risk reduction?	<50 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	4-6	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	Less than 25%	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	Impacts associated with spoil areas and changing currents with water flow.	N/A
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$251K - \$500K	Agree
What is the level of public support for this project?	Medium	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

Dare County Infrastructure Action 1: Comprehensive Stormwater Management Plan

County: Dare

Priority Grouping: High Priority

Priority Ranking: 1

Project Timeframe: 1 – 3+ years (depending on project priority); 1 year for planning, 3 years for implementation

Location: Countywide

Project Summary: Develop a comprehensive stormwater management plan to determine current and future stormwater system needs. Implement stormwater management solutions.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Outdated stormwater management plans need updating and funding to implement. Damage was experienced throughout the county from Hurricane Matthew due to lack of implementation of priority projects.	N/A
Consistent with existing plans (describe points of intersection/departure)	Albemarle Regional Hazard Mitigation Plan Dare County Land Use Plan NCDOT-CTP existing storm water management plans and land use plans of local communities.	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	Traffic impacts and property impacts for home and businesses.	Agree
For how long will this solution be effective?	Between 31 and 50 years	Agree
How effective is the risk reduction?	50-100 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	>6	Agree
Is coordination with other communities/counties needed to complete this project?	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	Unknown	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	No Impact	Agree
What impacts to the environment of the county will result from this project?	Extensive permitting may be required and a high water table may impact type of implementation strategy needed.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$1M+	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	County	Agree

Currituck County Economic Development Action 2: NC 12 Feasibility Study

County: Currituck

Priority Grouping: Low Priority

Priority Ranking: 15

Project Timeframe: 1-2 years

Location: Outer Banks

Project Summary: Currituck County's Outer Banks, which are an important economic resource for the county, are accessible only via NC 12 through Dare County. A section of NC 12 in Duck is particularly susceptible to flooding, which cuts off access to Currituck County Outer Banks. This project would fund a feasibility study coordinated with NCDOT, Dare County, and Town of Duck to evaluate alternatives for improvements to NC 12 in this area to reduce risk of NC 12 being severed for extended periods.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew NC 12 was cut off in Duck by floodwater. This blocks the only road access to the Currituck Outer Banks for emergency responders as well as for residents, visitors and tourists.	N/A
Consistent with existing plans (describe points of intersection/departure)	Consistent with goals of the Albemarle Regional Hazard Mitigation Plan and County CUR7 CUR9 and CUR10 which deal with coordinating with NCDOT and neighboring communities on road improvements.	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	The study will evaluate alternatives that would allow NC 12 to remain open to the maximum extent possible.	Agree
For how long will this solution be effective?	Between 11 and 30 years	Agree
How effective is the risk reduction?	100-200 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	Yes	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Between 26 and 50%	Agree
What impacts to the environment of the county will result from this project?	N/A	N/A
What is the capability of the local government to administer this project?	Low	Agree
What is the financial range of this project?	\$51K - \$100K	Agree
What is the level of public support for this project?	Unknown	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree

Who will administer this project?	Regional	Agree
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Camden County Infrastructure Action 1: Camden Causeway/US 158 Feasibility Study

County: Camden

Priority Grouping: Medium Priority

Priority Ranking: 13

Project Timeframe: 1-2 years

Location: Camden

Project Summary: This project is to provide funding for a feasibility study to improve or relocate US 158 to reduce the risk of this important connection being cut off during an emergency.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Camden Causeway (US 158) is the major east-west route through Camden County and the primary connection to medical facilities in Elizabeth City. Camden Causeway has been closed during flood events and the detour route to services in Elizabeth City is 30+ miles.	N/A
Consistent with existing plans (describe points of intersection/departure)	Consistent with goals of the Albemarle Regional Hazard Mitigation Plan for the region (REG2: Maintain and/or improve existing transportation infrastructure throughout the Region to enhance response times and aid in evacuations) and Camden County (CAM52: Maintain evacuation routes and disseminate information to the public).	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	The feasibility study would identify options for improvements to US 158/Camden Causeway that would reduce the risk of disruption.	Agree
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	>200 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	Yes	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Less than 25%	Agree
What impacts to the environment of the county will result from this project?	No direct environmental impacts.	N/A
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$101K - \$250K	Agree
What is the level of public support for this project?	Unknown	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	Regional	Agree

Camden County Environmental Action 1: US 158 Drainage Study (Phase I)

County: Camden

Priority Grouping: High Priority

Priority Ranking: 8

Project Timeframe: 1-2 years

Location: South Mills

Project Summary: US 158 Drainage Study Phase I: Water cannot flow across US 158 flooding roads, homes, swampland, and farms in Gates, Pasquotank, and Camden Counties. In coordination with adjacent counties and NCDOT, this project would provide funding for a drainage study for the US 158 corridor to identify improvements that could reduce flood damage to surrounding areas.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Hurricane Matthew resulted in flooding along US 158 to roads homes swampland and farms in Gates Pasquotank and Camden Counties including more than 3000 acres of farmland.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	The project would identify improvements that could reduce flood risk to roads homes businesses and farmland.	Agree
For how long will this solution be effective?	Between 11 and 30 years	Agree
How effective is the risk reduction?	Unknown	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	Yes	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Less than 25%	Agree
What impacts to the environment of the county will result from this project?	The project would identify solutions that could improve water flow and stormwater runoff.	N/A
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$51K - \$100K	Agree
What is the level of public support for this project?	Unknown	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	Regional	Agree

Camden County Environmental Action 2: US 158 Drainage Improvements (Phase II)

County: Camden

Priority Grouping: High Priority

Priority Ranking: 9

Project Timeframe: 2-5 years

Location: South Mills

Project Summary: US 158 Drainage Improvements Phase II: This project would implement drainage improvements identified in Phase I (Camden Environmental Action 1) to reduce flooding of residences, swampland, roads, and farmland in the US 158 area of Camden, Pasquotank, and Gates Counties.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	Hurricane Matthew resulted in flooding along US 158 to roads homes swampland and farms in Gates Pasquotank and Camden Counties including more than 3000 acres of farmland.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	The project would implement improvements that could reduce flood risk to roads homes businesses and farmland.	
	Agree	
For how long will this solution be effective?	Between 11 and 30 years	Agree
How effective is the risk reduction?	>200 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	Yes	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Medium to high confidence	N/A
What impact will this action have on the local economy/tax base?	Less than 25%	Agree
What impacts to the environment of the county will result from this project?	The project would implement solutions that could improve water flow and stormwater runoff.	
	N/A	
What is the capability of the local government to administer this project?	Medium	Agree
What is the financial range of this project?	\$251K - \$500K	Agree
What is the level of public support for this project?	Unknown	Agree

Bertie County Infrastructure Tier 2 Action 5: Salmon Creek Bridge

County: Bertie

Priority Grouping: High Priority

Priority Ranking: 6

Project Timeframe: 0-5 years

Location: US 17 - Salmon Creek Bridge

Project Summary: Salmon Creek bridge was topped and the surrounding area flooded – blocks US 17, no access for supplies east-west, cut off 5 counties north of Bertie County, Highway patrol lost 5 vehicles, cut off state evacuation route from east..

Project involves: Mitigating flooding upstream and regular maintenance of debris. Will facilitate water movement under the bridge without impacts to transportation services. Salmon Creek was approved as a State Park by legislature. Flood mitigation will improve the property. The state plans to put a lot of money here. Dig for Lost Colony happening in this area. Future I-87 is in a flood zone.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	The storm event highlights the potential for impacts at the neighborhood/town level and provides a footprint for the extent of stormwater mitigation and structural improvement in this neighborhood and around US 17.	N/A
Consistent with existing plans (describe points of intersection/departure)	Yes	Agree
Does this project comply with existing Local and State authority (codes, plan and ordinance)?	Yes	Agree
Does this project meet the intents and goals for the Hurricane Matthew Recovery Act?	Yes	Agree
Explain any benefits or impacts to the economy of the county from this project.	N/A	N/A
For how long will this solution be effective?	More than 50 years	Agree
How effective is the risk reduction?	>200 year event	Agree
How many public facilities are involved in this project (buildings and infrastructure)?	1-3	Agree
Is coordination with other communities/counties needed to complete this project?	No	Agree
Is this project consistent with Federal Laws	Yes	Agree
To what degree does this project adversely impact local floodplain/coastal zone management?	No Impact	Agree
To what degree will it be possible to positively quantify the environmental benefits and ROI of this project?	Low to moderate confidence	N/A
What impact will this action have on the local economy/tax base?	Unknown	Agree
What impacts to the environment of the county will result from this project?	Reduce overtopping of canals and preserve local stormwater facilities	N/A
What is the capability of the local government to administer this project?	Unknown	Agree
What is the financial range of this project?	\$501K - \$1M	Agree
What is the level of public support for this project?	High	Agree
What is the technical feasibility of this project?	Higher than 75%	Agree
Who will administer this project?	Unknown	Agree

Potential Innovative Regional Resilience Strategies

In addition to the regional resilience projects, other innovative regional resilience strategies were developed by discussing the findings, issues, and potential solutions identified by the planners leading the development of the County-level RRP. Regional resilience strategies could achieve economies of scale and benefit several counties dealing with issues that are cost-prohibitive for individual counties to take on. These regional strategies may also help undertake projects that need a comprehensive, long-term view e.g. stormwater management or transportation projects, and therefore help improve the overall resilience of the state in the areas of housing, economic development, infrastructure and environment. The additional potential innovative resilience strategies possible to implement at the regional level are as follows:

Potential Regional Economic Development Resilience Strategies

- **Low-impact development** – For growing urban areas, low-impact development techniques employed at the lot and subdivision level reduce stormwater runoff and downstream flooding.
- **Agricultural Alternative Power Supply** – Backup power needed for large-scale agricultural operations can be provided using animal waste to power a microgrid, or for electrical co-generation. These may be helpful in helping maintain regional economic vitality following a disaster.
- **Qualified local contractor program for reconstruction** – the State can coordinate with local governments and other local and regional stakeholder groups to identify local workforces that might be available to assist with recovery efforts. This provides multiple benefits to all involved through employment opportunities for those that might have lost their jobs as a result of Hurricane Matthew and in keeping resources local, benefitting the local economy.

Potential Regional Infrastructure Resilience Strategies

- **Comprehensive shelter occupant inventorying** - Coordination needed between DSS, Red Cross, FEMA and local EM to understand who is in which shelters and when they leave, because a lot of time was wasted by local EM officials trying to locate people who were already safe.
- **Road closure tracking and real-time rerouting** – Develop a system for real-time rerouting as many people had trouble understanding how to get around with all the road closures.
- **Creation of Comprehensive Transportation Mitigation Program** – Develop programs so that people are prepared and understand what to do when encountered with flooded roads, e.g. better dissemination of information on re-routing, shelter locations, signage, etc.
- **Wide-Area Flood Alert Sensor Network** – Install affordable flood sensors across entire watersheds for cloud-hosted data and GIS information accessible by desktop and mobile phones. The sensors are being developed by DHS Science and Technology Directorate.
- **Regional retention, detention and all-in-one basins** – Reduce stormwater runoff by creating a system of retention basins (permanent pools) and detention basins (dry areas that can collect water and have an outlet for slowly releasing the water; the areas can be used as parking lots, recreation areas, etc.). A detention basin can be an all-in-one that has a permanent pool (retention basin) with an infiltration/filtering bottom.

- **Labeling and inventory of natural and manmade water and stormwater channels** – To support regular inspection and maintenance of the channels, an inventory is essential. A regional system would be consistent and convenient to for multiple counties to use, and can aid in responding to problem sites. Communities participating in the Community Rating System can get credit for this activity.
- **Micro loans and/or grants for private dam owners** – State could help private dam owners (HOAs, community associations) pay to rebuild their dams with conditions that dam owners provide measures to ensure safety in future events (POC for State to identify as a manager, lake level gauge to help State make decisions about releases)
- **Solutions to reduce flooding of I-95** – Identify the hot-spots on this region, major highway through the state and work with NCDOT to mitigate them using a combination of solutions like enlarging culverts, creating detention basins, etc.

Potential Regional Environmental Resilience Strategies

- **Centralized debris/silt traps** – ongoing stream maintenance to reduce clogging of streams and rivers. Debris/silt traps can serve to collect catch debris and sediment in centralized locations making maintenance easier.

At this point, the strategies listed above are to identify potential regional resilience issues and possible solutions to those issues. They currently are not specific resilience strategies identified through the County-level planning processes, but may be considered for implementation at a larger, regional or statewide scale.

Summary

Implementation has already begun for some of these actions but for those that have not already been funded, the State of North Carolina will begin a process of prioritizing the actions and seeking to match a funding stream to each action. Those that are not matched with a funding source will be added to the State’s Unmet Needs Report. Funding for Unmet Needs will be sought through additional funding from Congress and from the North Carolina General Assembly. Any action that cannot be matched to a funding source should be incorporated into each County’s Hazard Mitigation Plan for consideration for future funding. It is important to seek to implement as many of these actions as feasible. Doing so will significantly contribute to helping improve the resiliency of North Carolina’s communities.