

# **Hurricane Matthew Resilient Redevelopment Plan**

## **Perquimans County**



May 2017

Version 1.2

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# Change Log

Version	Date	Summary of Changes
1.1	6/15/17	Minor Revisions
1.2	8/30/17	Labor and unemployment data updated



## 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 25 people lost their lives, and over 100,000 homes, businesses, and government buildings sustained damage estimated at \$4.8 billion.<sup>1</sup> 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) initiative 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

This document is a snapshot of the current needs of the County regarding holistic recovery and redevelopment. The plan will evolve as the county analyzes the risk to its assets, identifies needs and opportunities, determines the potential costs and benefits of projects, and prioritizes 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.

<sup>1</sup> 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>.

After multiple public meetings, Perquimans County has identified nine projects in four pillars: Housing, Economic Development, Infrastructure, and Environment. Details of these projects can be found in Section 4 of this plan.

Pillar	Project/Action Count
Housing	0
Economic Development	1
Infrastructure	4
Environment	4
<b>Grand Total</b>	<b>9</b>

**Table 1. Perquimans County Summary of Projects by Pillar**





# 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. <sup>2</sup>

## 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.

- There were 81,832 individuals registered for FEMA/state assistance.

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<sup>2</sup> Governor McCrory’s Request for Federal Assistance for Hurricane Matthew Recovery, November 14, 2016



- 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 initiative 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 initiative 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 initiative consists of planning and implementation phases and is managed through North Carolina Emergency Management (NCEM).

## Scope of the Plan

This document is a snapshot of the County’s current needs for achieving holistic recovery and redevelopment. The plan will evolve as the County analyzes the risk to its assets, identifies needs and opportunities, determines

the potential costs and benefits of projects, and prioritizes 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 taking into account 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. Four rounds of discovery, analysis, collaboration, and interaction were held with each affected county. Each meeting had two components: an in-depth working session with county officials, subject matter experts, and planners from the affected 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.

**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 resilient redevelopment planning process. Each municipality in those counties, as well as the five 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.

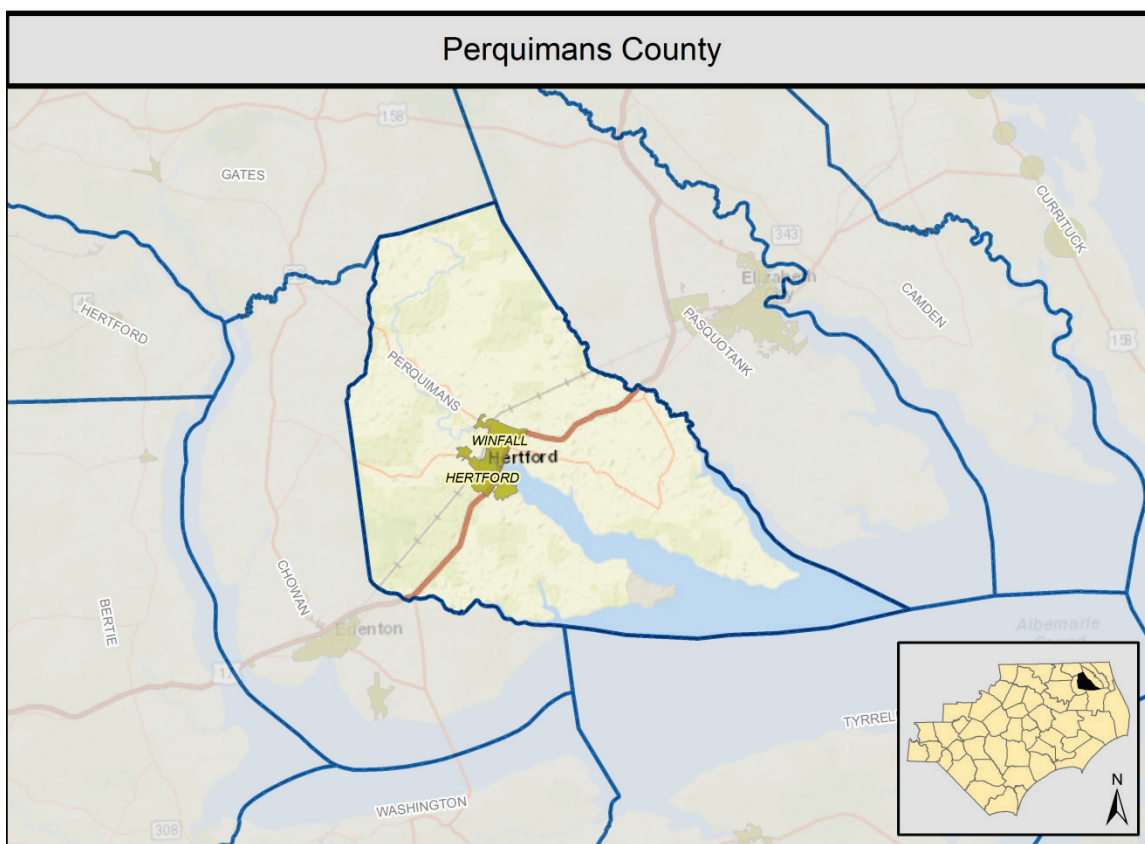


Figure 2. Perquimans County and Neighboring Counties

### Data, 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 project or action 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. County Profile



## 2. County Profile

Perquimans County is located in the northeast corner of North Carolina, between the Counties of Pasquotank (east boundary), Gates (northwest boundary) and Chowan (southwest boundary) and Albemarle Sound as the southern boundary. It is comprised of two census-designated places: the Towns of Hertford (the county seat) and Winfall. Its current population is 13,498. This section provides a profile of housing, economics, infrastructure, environment, and administration within Perquimans County.

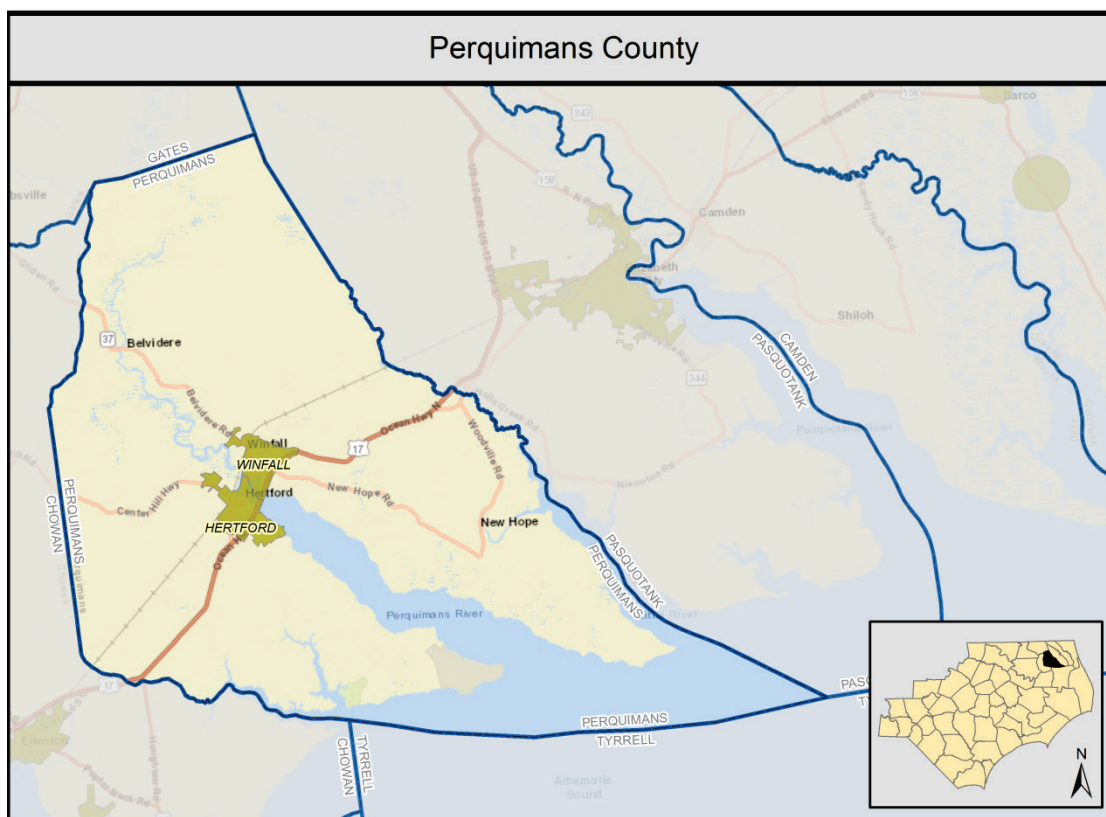


Figure 3. Perquimans Base Map

### Demographic Profile

Demographics for Perquimans County and census-designated places within the county are summarized and compared to statewide averages in this profile. The demographic data is from the 2000 Census, 2010 Census, and 2011-2015 American Community Survey five-year estimates.

### Population

Perquimans County has a population of 13,498. Hertford has a population of 2,197 and Winfall has a population of 624.<sup>3</sup>

### Population Change (2000 to 2010)

The Perquimans County population increased between the 2000 and 2010 Census. In 2000 the population was 11,368 and in 2010 it was 13,453. The population increased by 2,085 people, or 18.3 percent. In comparison, North Carolina grew by 19 percent from 8,049,313 people in 2000 to 9,535,483 in 2010.<sup>4</sup>

3 Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B01001, Sex by Age

## Age

The median age in Perquimans County is 48, which is 6 years older than North Carolina. With Perquimans County, Hertford and Winfall each have a median age of 42.<sup>3</sup>

## Race and Ethnicity

Perquimans County is mostly White (73 percent) and African American (24 percent) with other races constituting the remaining 3 percent. In comparison, North Carolina is 70 percent White, 22 percent African American, 1 percent American Indian and Alaska Native, 3 percent Asian, less than 1 percent Native Hawaiian/Pacific Islander, 3 percent Some Other Race, and 2 percent Two or More Races.<sup>5</sup>

Within Perquimans County, Hertford is 52 percent White and 44 percent African American with 1 percent of the population identifies as Some Other Race. Winfall is 61 percent White and 36 percent African American with 0.0 percent of the population identifies as Some Other Race.

The Latino population in Perquimans County is 2 percent compared to 9 percent for North Carolina. Hertford has a Latino population of 6 percent while Winfall has 2 percent.<sup>5</sup>

Geography	White	Black or African American	American Indian and Alaska Native Alone	Asian	Native Hawaiian/Pacific Islander	Some Other Race	Two or More Races	Total Non-White
Town of Hertford	52.3%	43.6%	0.0%	0.0%	0.0%	1.0%	3.1%	47.7%
Town of Winfall	61.1%	36.1%	0.3%	0.3%	0.0%	0.0%	2.2%	38.9%
<b>Perquimans County</b>	<b>73.0%</b>	<b>24.3%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.4%</b>	<b>2.1%</b>	<b>27.0%</b>
<b>North Carolina</b>	<b>69.5%</b>	<b>21.5%</b>	<b>1.2%</b>	<b>2.5%</b>	<b>0.1%</b>	<b>3.0%</b>	<b>2.4%</b>	<b>30.5%</b>

Table 2. Perquimans County Race and Ethnicity

## Limited English Proficiency

Limited English Proficiency (LEP) is defined as populations 18 years or older that speak English less than very well. In Perquimans County, most of the individuals identified as LEP speak Spanish while others speak Indo-Euro, Asian/Pacific, or other languages. Similarly, the primary language group for LEP individuals in North Carolina is Spanish. Within Perquimans County, the language group for the LEP populations in Hertford and Winfall is also Spanish.<sup>6</sup>

4 Source: 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

5 Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B02001, Race and Table B03002, Hispanic or Latino Origin by Race

6 Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B16004, Age by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over

## Poverty

In Perquimans County, 20 percent of the population is below the poverty level compared to 17 percent of the North Carolina population. The population below the poverty level is 38 percent in Hertford and 31 percent in Winfall.<sup>7</sup>

## Low and Moderate Income Individuals

In Perquimans County, 37 percent of the population is classified as low and moderate income (LMI) individuals based on the US Department of Housing and Urban Development's definition. In comparison, 39 percent of the North Carolina population is classified as LMI.<sup>8</sup>

## Median Household Income

The median household income of the population for the age group 25 years to 64 years is \$45,200 in Perquimans County and \$53,000 in North Carolina. The median household income for 25- to 64-year olds in Hertford is \$23,100 and Winfall is \$38,400.<sup>9</sup>

## Zero Car Households<sup>10</sup>

In Perquimans County, 10 percent of households do not have a vehicle available compared to 7 percent of North Carolina households. Within Perquimans County, Hertford has 31 percent of households without access to a vehicle and Winfall has 13 percent. Not having a car available directly impacts the ability to evacuate in an emergency. The residents of Hertford would have the greatest need for assistance in the event of an evacuation.

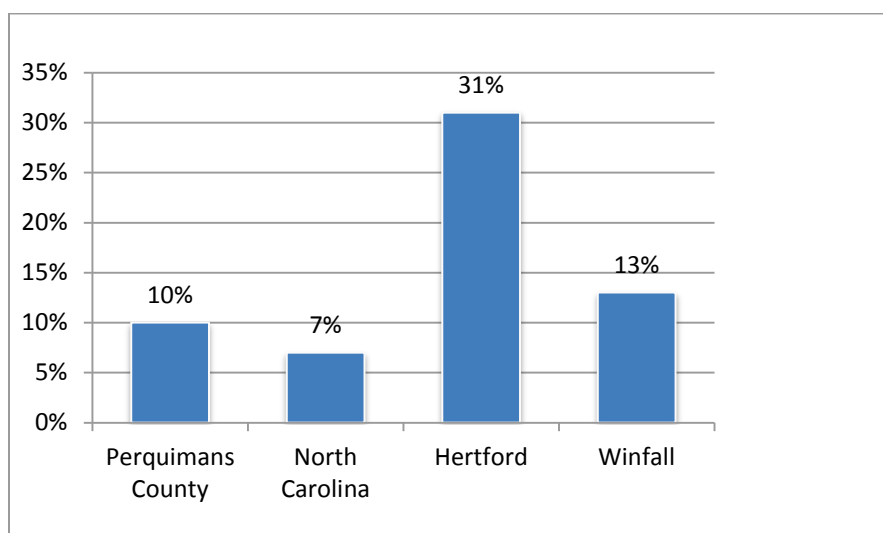


Figure 4. Zero Car Households by Percentage

7 Source: US Census Bureau, American Community Survey 5-year Estimate (2001-2015), Table C17002, Ratio of Income to Poverty Level in the Past 12 months

8 Source: US Department of Housing and Urban Development, Estimate of Low and Moderate Income Individuals, <https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-block-groups-places>

9 Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B19094, Median Household Income in the Past 12 Months

10 Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B25044, Tenure by Vehicles Available

### Commuting: Travel Time to Work, Means of Transportation<sup>11</sup>

The majority of Perquimans County residents commute alone to work by vehicle, 79 percent, which is close to the North Carolina average of 81 percent. Hertford has a rate of 83 percent for commuters commuting alone while the rate in Winfall is 78 percent.

The percentage of residents commuting by public transportation is 0.3 percent in Perquimans County and 0.0 percent each for Hertford and Winfall compared to 1 percent of North Carolina commuters. The percentage of residents who commute by walking, bike, or motorcycle is 3 percent for Perquimans County, 1 percent for Hertford and 10% for Winfall compared to the North Carolina average of 2 percent.

The mean commute time to work for Perquimans County residents is 31.2 minutes. In comparison, the North Carolina mean commute time is 24.7 minutes and the Hertford and Winfall mean commute times are 36.3 and 26.1 minutes, respectively.

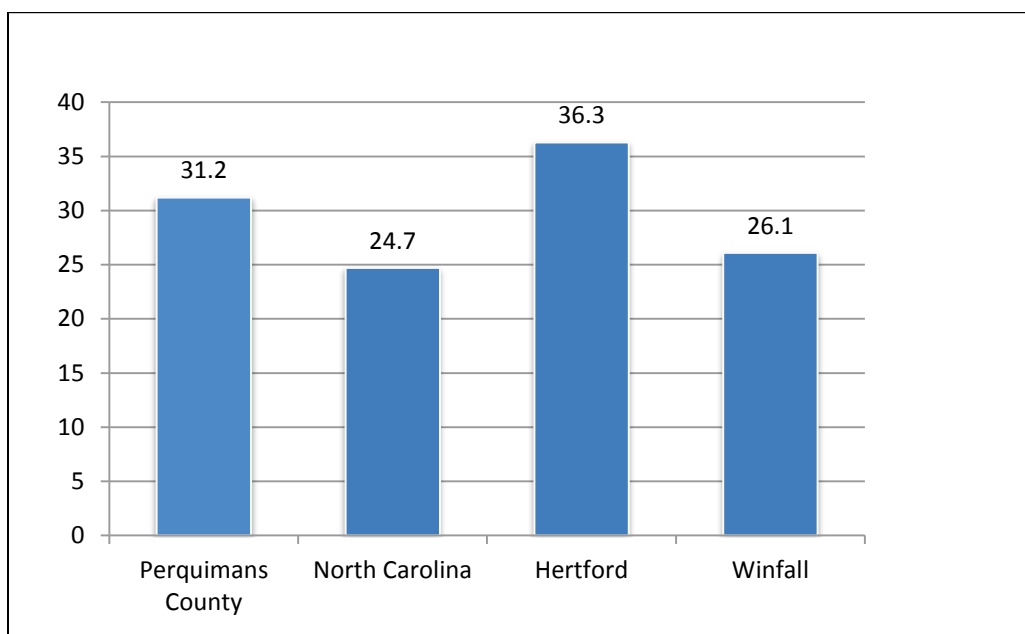


Figure 5. Mean Commute Time to Work in Minutes

<sup>11</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B08301 Means of Transportation to Work, and Table GCT0801 Mean Travel Time to Work of Workers 16 Years and Over Who Did Not Work at Home (Minutes)

## Housing Profile<sup>12</sup>

Perquimans County has over 7,000 housing units, 70 percent of which are single-family homes, 4 percent multi-family units, and 26 percent manufactured housing.

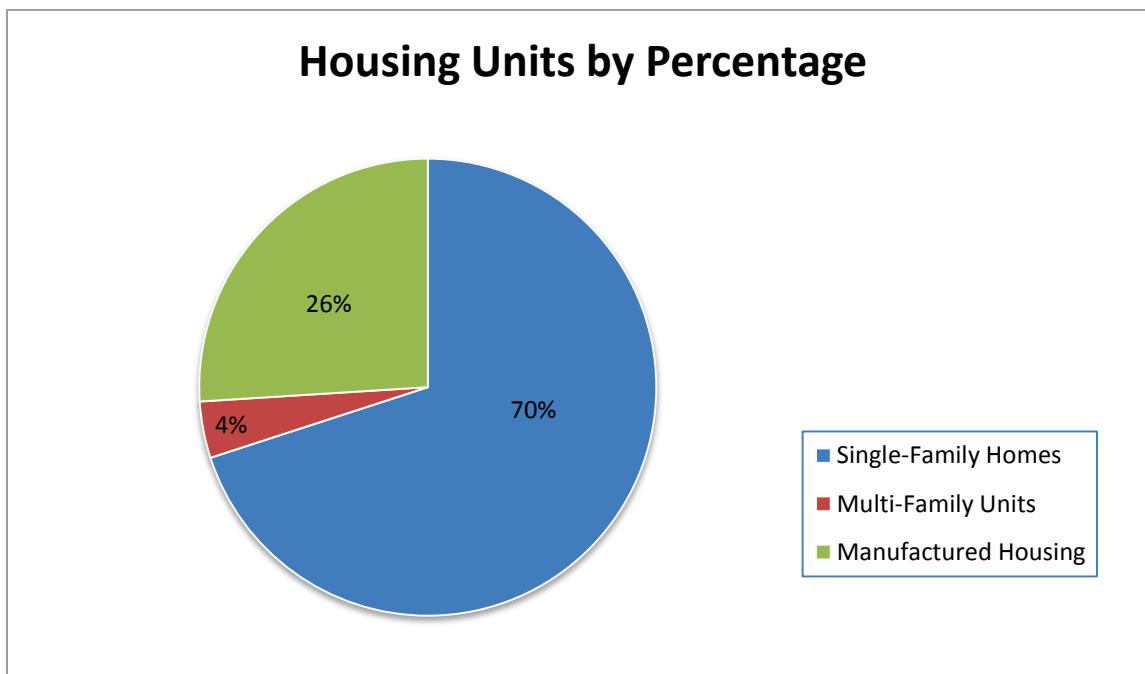


Figure 6. Housing Units by Percentage

In Perquimans County 22 percent of housing units are vacant, which is higher than the 15% vacancy rate for North Carolina. In Hertford, 20 percent of the housing units are vacant while 23 percent of the housing units in Winfall are vacant.

Of the occupied housing units, 78 percent are owner-occupied in Perquimans County compared to 65 percent in North Carolina. The owner occupied housing units in Hertford is 49 percent while it is 68 percent in Winfall.

The median housing value in Perquimans County is \$166,000 and the median values in Hertford and Winfall are \$114,000 and \$147,000. In comparison, the median housing value in North Carolina is \$138,000.

According to the National Housing Preservation Database, Perquimans County has 341 affordable housing units, located in Hertford. No affordable housing units were located in Winfall.

<sup>12</sup> Sources: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B25002, Occupancy Status; Table B25003 Tenure; Table B25024 Units in Structure; Table B25077 Median Value (Dollars) - National Housing Preservation Database.

## Economic/Business Profile

In Perquimans County, most of the employment is provided by government, retail, health care and agriculture.<sup>13</sup>

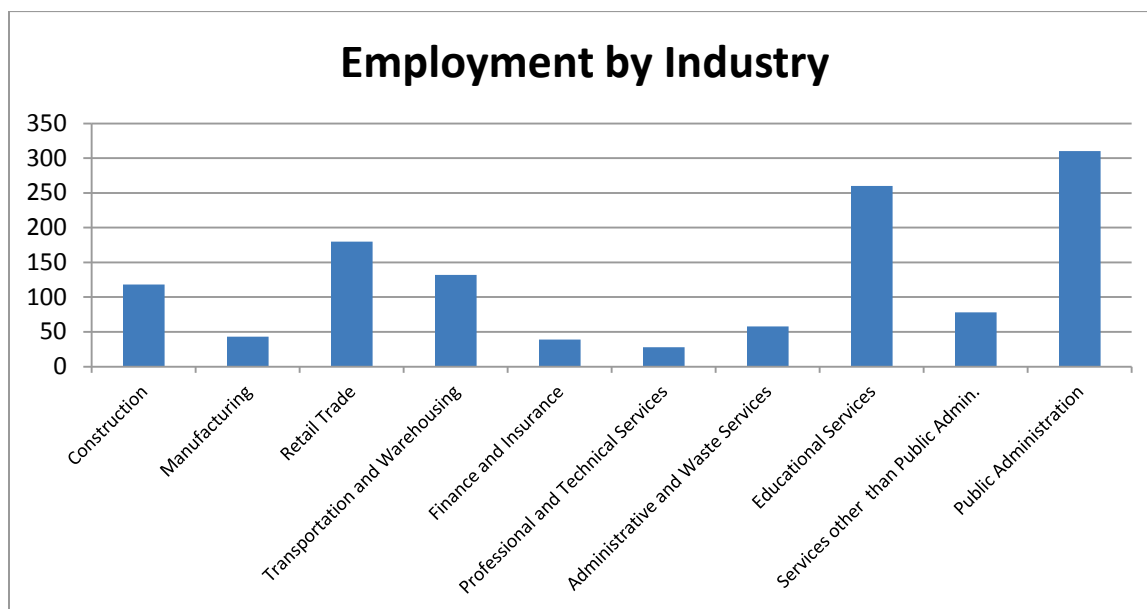


Figure 7. Employment by Industry

According to the US Census Bureau's Longitudinal-Employer Household Dynamics Program, the largest concentrations of jobs within Perquimans County are in Hertford and Winfall and adjacent county areas along US Route 17 and NC 37.<sup>14</sup>

## Labor Force

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 civilian labor force population of Perquimans County is 5,166.<sup>15</sup> Hertford has 47 percent and Winfall has 57 percent of residents 16 years or over in the labor force.<sup>16</sup>

The civilian unemployment rate in Perquimans County is 6.4 percent. In comparison, the North Carolina civilian unemployment rate is 5.1 percent.<sup>15</sup> Within Perquimans County, Hertford has a civilian unemployment rate at 16 percent and the rate for Winfall is 13 percent.<sup>16</sup>

<sup>13</sup> Source: AccessNC – North Carolina Department of Commerce, April 2017:  
<http://accessnc.nccommerce.com/DemoGraphicsReports/pdfs/countyProfile/NC/37065.pdf>

<sup>14</sup> Source: US Census Bureau Longitudinal-Employer Household Dynamics Program

<sup>15</sup> Source: Civilian Population and Unemployment Rate - Labor and Economic Division (LEAD) of North Carolina Department of Commerce – Local Area Unemployment Statistics <http://d4.nccommerce.com/LausSelection.aspx>

<sup>16</sup> Source: US Census Bureau, American Community Survey 5-year Estimates (2011-2015), Table B23025, "Employment Status For The Population 16 Years And Over

## Major Employers

The top ten employers in Perquimans County<sup>16</sup> represent the education, health services, public administration, and retail industries.

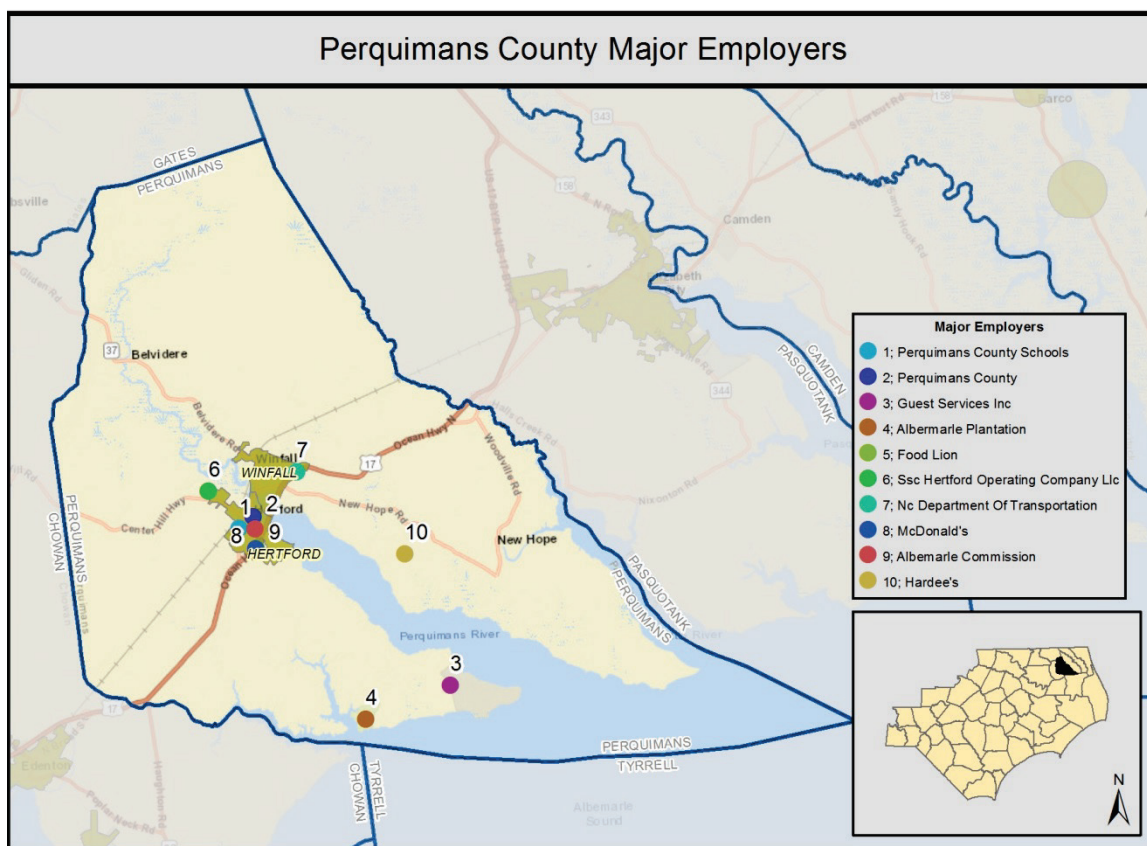


Figure 8. Major Employers by Number of Employees

## Economic Development<sup>17</sup>

Perquimans County does not have a county supported economic development park, but a private enterprise, the Perquimans Commerce Centre is under development. Based on the county's strategic plan, the following economic development priorities have been identified for the County:

- Marine
- Alternative energy
- Small business development
- Downtown Hertford redevelopment
- Tourism
- Agriculture biotechnology

<sup>16</sup> Sources: Perquimans County Department of Economic Development, Rocky Mount/Perquimans Community Development Corporation, Perquimans Community College, and Visit North Carolina



## Infrastructure Profile

Transportation, health, education, water, and power infrastructure are summarized for Perquimans County in the sections that follow.

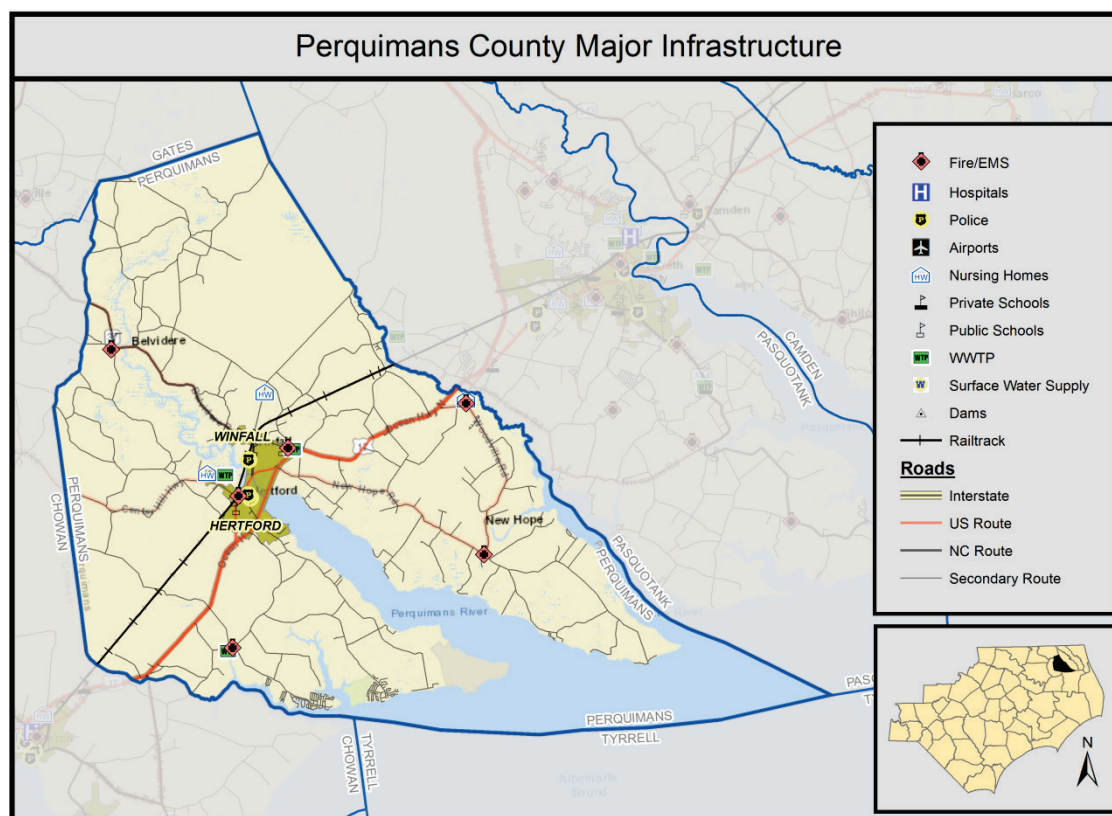


Figure 9. Perquimans County Major Infrastructure

## Transportation

Perquimans County is connected to the region by US 17 and NC 37. These highways provide Perquimans County with access to Interstate 70, Norfolk, VA, the Outer Banks, and Albemarle Sound. Perquimans County is also served by rail from the Chesapeake and Albemarle Railroad. The nearest regional airports for Perquimans County are Edenton, NC (Chowan County, 17 miles) and Elizabeth City, NC (Pasquotank County, 22 miles). Scheduled domestic and international passenger services are available at the Norfolk International Airport about 90 minutes northeast of Hertford in Norfolk, VA.

## Health

The nearest hospitals are Chowan Hospital in Edenton, NC (Chowan County, 12 miles) and the Sentara Albemarle Medical Center in Elizabeth City, NC (Pasquotank County, 17 miles). There are several medical practices in Hertford and Winfall.

## Education<sup>18</sup>

Public education is overseen by the School District of Perquimans County. The District administers one school each grades pre-K to 2, grammar for grade 3 to 5, middle school grades 6 to 8 and high school. There are no

<sup>18</sup> Source: School District of Perquimans County



colleges or universities located in Perquimans County. The nearest institutions of higher learning located in Elizabeth City, NC and include Elizabeth City State University, the College of the Albemarle, and Mid-Atlantic Christian University.

## **Water**

The county has two water treatment facilities – the Bethel and Winfall Plants Hertford has its own treatment facility. The capacities for the three water treatment plants are 1.15 million gallons per day (MGD) for Bethel, 0.72 MGD for Winfall and 0.79 MGD for Hertford.

Municipal wastewater is treated at the two wastewater treatment facilities in the county and one in Hertford.<sup>19</sup>

## **Power**

There are three solar power plants located within Perquimans County along US 17 (one plant) and US 37 (one plant). These three power plants have a net summer capacity of 5 megawatts (mw) each (15 mw total).<sup>20</sup>

## **Environmental Profile**

Water resources, natural areas, managed areas, biodiversity, wildlife habitat, and recreation are summarized for Perquimans County in the sections that follow.

### **Water Resources**

The Perquimans River flows generally north to south near the center of Perquimans County. The Little River also flows generally north to south as the east border of the county while the Yeopin River flows north to south and is the west border of the county. The other major waterways are Bethel Creek, Goodwin Creek, Mill Creek, Sutton Creek, Yeopin Creek and the Albemarle Sound which is at the south end of the county.

Wetlands are present along the rivers and their tributaries. The most common wetland type in Perquimans County is freshwater forested/shrub wetland and coastal wetland.<sup>21</sup>

### **Natural and Managed Areas**

According to the NC Natural Heritage Program, there are one area each of high and very high value along the south end of the county, adjacent to the Perquimans River (high) and the Albemarle Sound (very high). There are several scattered, managed areas under state ownership within Perquimans County. Managed areas are properties and easements where natural resource conservation is one of the current primary management goals, or are of conservation interest.<sup>20</sup>

### **Biodiversity and Wildlife Habitat**

The NC Natural Heritage Program produces a biodiversity and wildlife habitat assessment for the state. According to this assessment, areas with the highest rating for biodiversity and wildlife habitat are along the Perquimans River and its tributaries. These areas rank between a 6 and 8, with 10 as the highest possible score. Other areas of the county have a rank from 2 to 6, with approximately 50 percent of the county without a rating.<sup>20</sup>

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18 Sources: NC Division of Water Resources, Local Water Supply Plans

19 Source: US Department of Energy, US Energy Mapping System

20 Source: NC Natural Heritage Program

## Parks and Recreation

Perquimans County does not have a parks department (per the County’s website). However, the county does have 20 identified walking trails, four major biking trails and a marina. There are several neighborhood parks, a community center, a recreation center, and school gyms used for various activities outside of school hours. Most of these facilities are located in and around the Town of Hertford.

Recreational boating is one of the largest tourism activities in Perquimans and other counties along the Albemarle Sound and the rivers and tributaries that feed into the sound. The county and city are destinations for recreational boaters and have facilities at multiple locations to provide services and docking for the boaters.<sup>22</sup>

## Administrative Profile

The administrative capabilities of Perquimans County and the Towns of Hertford and Winfall are discussed in great detail within Section 6 – Capabilities Assessment of the Albemarle Regional Hazard Mitigation Plan (05/12/15). The assessment evaluates the capabilities of the County and the towns to implement mitigation actions across the areas of administrative and technical capabilities, planning and regulatory capabilities, financial capabilities, educational and outreach capabilities and legal and political capabilities. Many more details about the capabilities of Perquimans County and the City can be found in that document.

In terms of administrative capabilities, the County has some of the staff and the necessary plans, policies and procedures in place that are found in communities with “moderate” capabilities. Perquimans County has Emergency Services and a Planning department with the capacities to assist in implementing the resilience strategies proposed in this plan. Some of the other indicators of capability for the County include the following: Zoning Ordinance, Subdivision Regulations, and Floodplain Management Ordinance. These plans, policies and procedures help ensure that new development in the County will be done in a responsible manner and in non-hazardous areas.

The Towns of Hertford and Winfall have Planning departments that would likely be able to assist with implementing the strategies in this plan as well. While the capabilities may not be quite as robust as those at the County level, the towns would still be considered to have “low to moderate” capabilities.

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21 Source: Elizabeth City/Perquimans County Parks and Recreation Department





### **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 Perquimans County is highlighted graphically in the figure below.

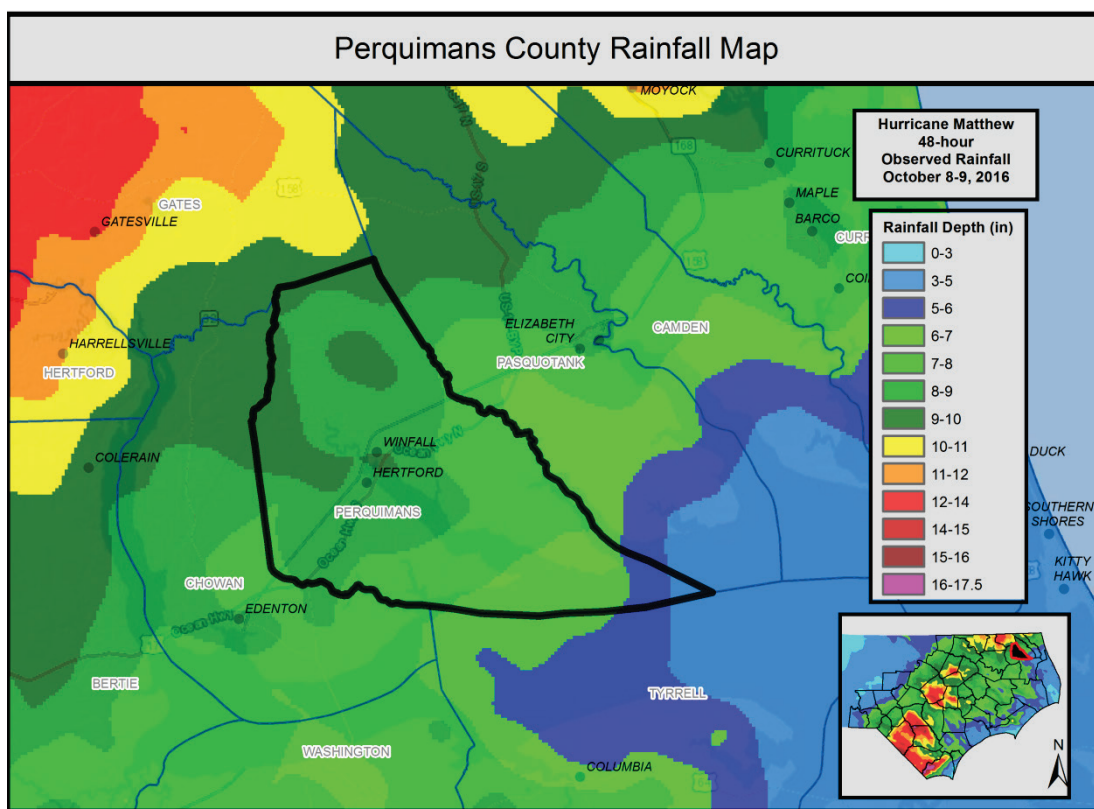


Figure 10. 48-hour Observed Rainfall Depth (October 8-9, 2016)

#### Housing

According to Individual Assistance claims as of March 2017, there were 106 impacted houses in Perquimans County 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. This also does not take into account other historic impacts to the county or other areas of concern for flooding that may not have occurred during this storm. With that in mind, the planning team attempted to take a comprehensive look at both Hurricane Matthew impacts and any historic impacts that local officials felt would validate areas that should be considered at high risk for future flooding.

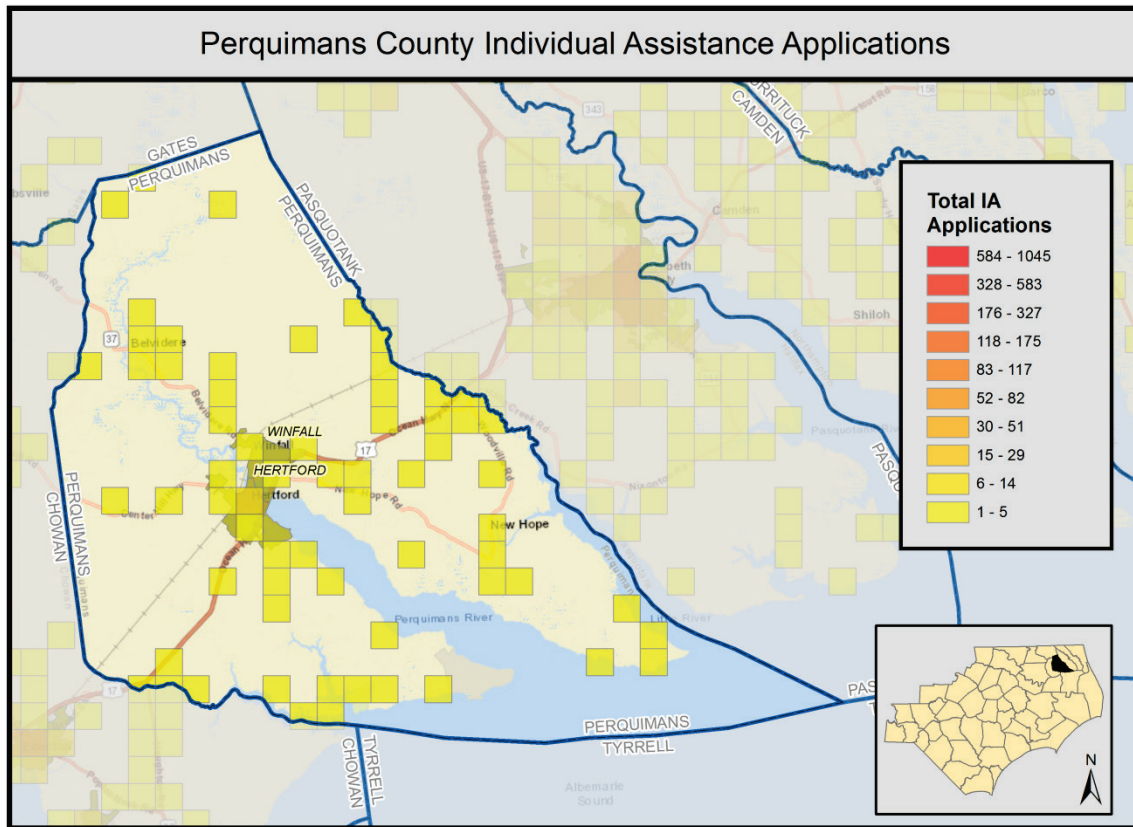


Figure 11. Perquimans County IA Applications by Area

The bullets below summarize some of the major impacts to housing that were identified by local officials in multiple meetings. Overall, there were not a lot of damages to housing from Hurricane Matthew.

- **Temporary Housing Impacts:** Impacts to housing in Perquimans County from Hurricane Matthew occurred primarily in the Woodland and Chaplain areas. County officials noted that previous acquisitions following Hurricane Floyd likely reduced impacts from Hurricane Matthew. The County stated that they did not plan to submit any FEMA Hazard Mitigation Program (HMGP) subapplications for either acquisition or elevation of residential structures.

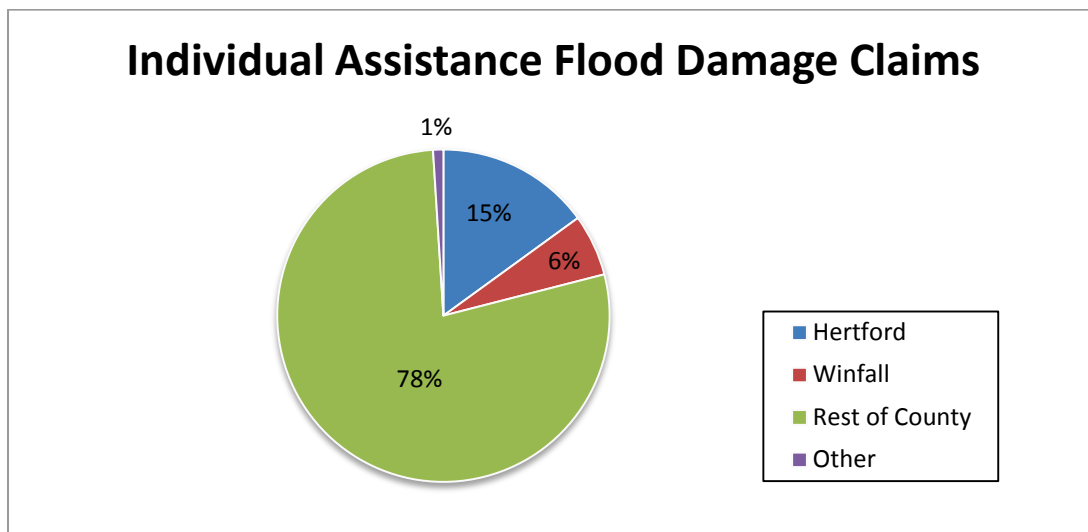


Figure 12. Individual Claims by Percentage

- **Displaced Residents and Tax Base Impacts:** County officials noted that there were an estimated 10 families that were temporarily relocated after Hurricane Matthew. As of March 2017, there were with no families that were still displaced. This figure may be higher when considering the families living with family or friends.

### **Economics / Business / Jobs**

Local officials in multiple meetings identified impacts to the economy in Perquimans County from Hurricane Matthew to the economy/businesses/jobs. County officials noted that some of this flooding occurred because of a lack of maintenance in drainage ditches throughout the county.

- **Impacts to Businesses:** Only one business in Perquimans County experienced significant flooding because of Hurricane Matthew. This business, located in the Woodwest area, experienced flooding damage because water accumulated on adjacent roads and then expanded onto the property due to passing traffic.
- **Impacts to Agriculture:** A number of agricultural impacts were reported to the Farm Service Agency following Hurricane Matthew. The severity of these impacts varied from farm to farm, but local officials noted that one farm lost between 40,000 and 50,000 chickens.

### **Infrastructure**

Impacts to infrastructure in Perquimans County are relatively limited compared to those in other counties. According to Public Assistance claims, which are often closely tied to infrastructure, as of March 2017, Perquimans County made \$91,494 in claims related to Hurricane Matthew. It should be noted that additional claims from Hurricane Matthew may still be pending, so this number may not reflect the final claims data from the event. The bullets below summarize some of the major impacts to infrastructure from Hurricane Matthew identified by local officials.

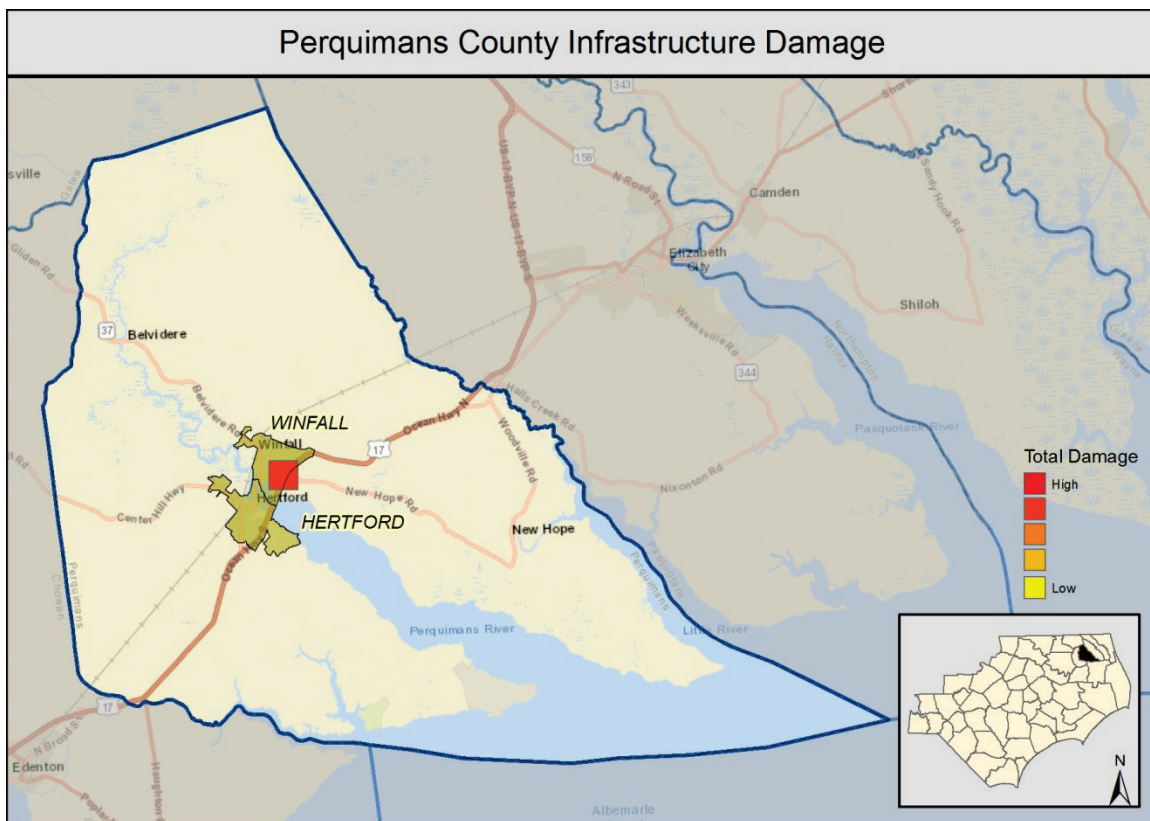


Figure 13. Perquimans County Infrastructure Damage

County and State infrastructure (primarily roads and bridges) were the largest areas of concern in the wake of Hurricane Matthew as there were several types of infrastructure that were damaged in multiple locations. The bullets below summarize some of the major impacts to infrastructure that were identified by local officials from during multiple meetings.

- **Roadway and Bridge Impacts:** A number of roads throughout the county were closed during and after Hurricane Matthew due to flooding in low areas. Many of these locations have a history of flooding due to heavy rains and previous hurricanes or tropical storms. Although the list below represents the most significant impacts from Hurricane Matthew, the County will not be seeking any projects for these roads and bridges. The following roads were closed during and after Hurricane Matthew:
  - Highway 67 was closed for approximately six hours during the peak of the storm. This highway represents a major hospital access route. Flooding also left several motorists stranded on this highway during and after the storm.
  - An approximately 75-foot section of the Chipanoke Road bridge washed out during Hurricane Matthew and has not yet been repaired. Several stranded citizens had to be rescued from this area by the National Guard.
  - The bridge located near the intersection of Highway 37 and Belvedere Road was closed for a week during and after the hurricane, which limited the capacity of emergency vehicles to respond in the area.
- **Inadequate Drainage:** As described above, local officials attribute much of the flooding within the county to inadequate drainage. Debris in channels and outlet blockages occurred for a number of

reasons, including inorganic debris, trees and other organic material trapped in waterways that include local canals and roadside drainage ditches. The more significant impacts from Hurricane Matthew included:

- **Burnt Mill Watershed** – Culverts that washed out during Hurricane Matthew need to be replaced. Erosion control measures and debris removal that are needed. These measures will increase the flow and stabilize the bank to reduce sediment transport or flow restrictions.
- **Bagley Swamp Canal** - Debris from Hurricane Matthew and previous flood events that has accumulated in the canal and needs to be removed. This has reduced the flow capacity in the canal and caused overbank flooding. The clearing and snagging project includes 15,000 linear feet of clean up. This will increase flow capacity and help navigation.
- **Bear Swamp Watershed** - Debris from Hurricane Matthew and previous flood events that has accumulated in the watershed that needs to be removed. This has reduced the flow capacity in the tributaries and caused overbank flooding. The clearing and snagging project includes 24,000 linear feet of clean up. This will increase flow capacity.
- **Perquimans River** - There is a significant amount of debris, including trees and woody vegetation, from Hurricane Matthew and previous flood events in the river that needs to be removed. This has reduced the flow capacity while blocking drainage and navigation. The clearing and snagging project includes 30,000 linear feet of clean up. This will increase flow capacity and drainage and remove navigation restrictions.
- **Little River Watershed and Wetland Bank** - During Hurricane Matthew, 500 linear feet of wetland bank washed out and sediment from agricultural lands washed into the wetland. The wetland restoration project will restore the wetland to its previous condition while also preventing sediment migration into the wetland.
- **Beaver Dam Removal and Beaver Relocation** - There are an unknown number of beaver dams throughout the County that make existing flood situations worse by restricting flow and increasing water levels. The project involves the location and removal of existing beaver dams and relocation of the beavers to reduce water levels and debris that could restrict flow in downstream culverts or bridges.
- **Impacts to Utilities:** Perquimans County suffered relatively minor impacts to utilities from Hurricane Matthew. The majority of the county lost power for a day or less, if at all, although some rural areas lost power for up to three days. The County water plant was able to maintain operations during the storm and did not sustain any significant damage.



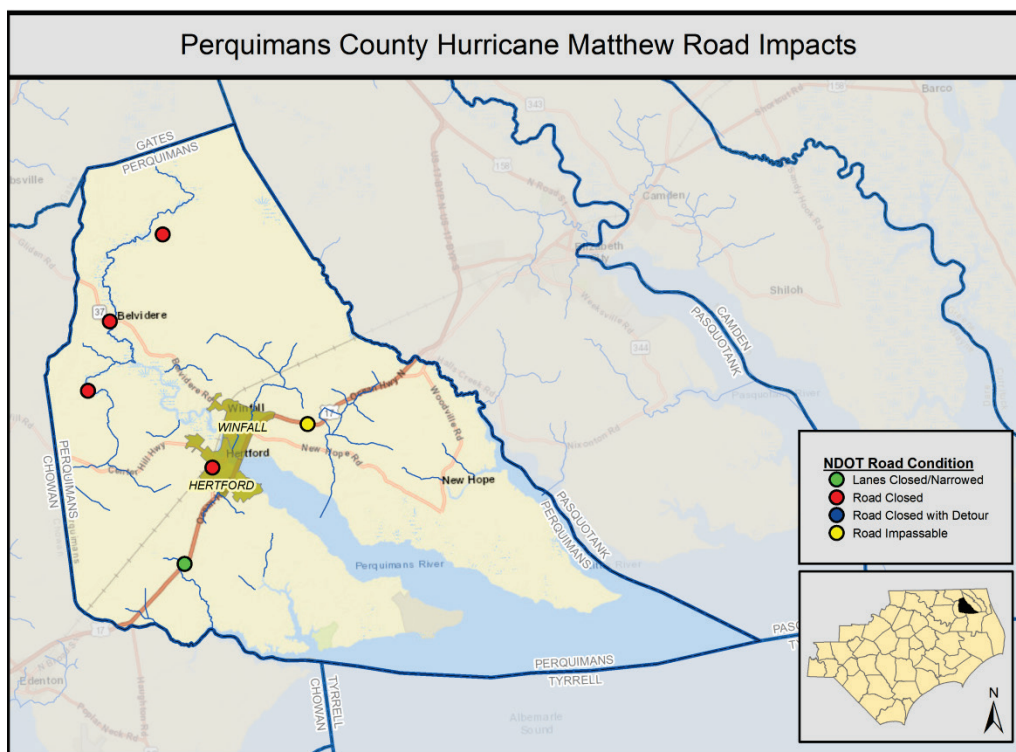


Figure 14. Impacted NCDOT Structures in Perquimans County

## Ecosystems / Environment

Environmental impacts in Perquimans County as a result of Hurricane Matthew link to other impacts in housing, economic development, and infrastructure and are broad in nature. In some cases, preexisting damage or lack of attention to forests, wetlands, and natural systems created new impacts during Hurricane Matthew. These impacts likely will recur for future storm and flood events.

- **Wetland Bank Restoration:** This project is located within the Little River watershed and involves a portion of a wetland bank that washed out during Hurricane Matthew. The washout allowed sediment from adjacent agricultural areas to flow into the wetland area.
- **Countywide Installation of Weather Stations:** The installation of small, unmanned stations at County schools or facilities will provide real-time data that is essential for determining school closings and evacuations notices during heavy rains, tropical storms or hurricanes.
- **Mosquito Abatement Program:** This project would target post-flood standing bodies of water throughout the County to keep mosquito populations from increasing.
- **Beaver Dam Removal and Beaver Relocation:** There are an unknown number of other beaver dams throughout the County. The removal of these dams will reduce flooding and remove potential debris that could block or close-off culverts and bridge openings further downstream in the watershed.



An aerial photograph showing a residential neighborhood partially submerged in floodwater. The water is a murky, brownish-yellow color, covering large areas of the landscape, including lawns and some trees. Several houses with light-colored siding and dark roofs are visible, some with water reaching their windows. A network of streets is visible, with some sections completely underwater. The background is filled with dense green trees, some of which are also partially submerged. The overall scene depicts the impact of flooding 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 Perquimans County. These actions were identified and refined during three 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.

Meeting 1 was designed to introduce the community and County points of contact to the Resilient Redevelopment Planning process and goals. This meeting allowed the planning team to capture areas within the county that were damaged during Hurricane Matthew and to hear what potential mitigation actions had already been considered. Draft resilience actions were then presented at Meeting 2 of the planning process. This was done to garner general buy-in on the draft actions from the County-level planning teams and residents. More details on the actions were collected between Meetings 2 and 3 through research and follow-up phone calls and emails with the primary points of contact. Meeting 3 provided the opportunity to collect and finalize details for the draft actions. Meeting 4, scheduled in early May 2017, allowed the County points of contact to rank the identified actions, group them into High, Medium, and Low Priorities, and to approve their inclusion in the plan.

Pillar	Project/Action Count
Housing	0
Economic Development	1
Infrastructure	4
Environment	4
<b>Grand Total</b>	<b>9</b>

**Table 3. Perquimans County Summary of Projects by Pillar**

The following table is ordered by the rankings and priorities provided by Perquimans County during Meeting 4:

Pillar	Action Name	Priority	Overall Ranking
Environment	Perquimans Environmental Action 1: Wetland Bank Restoration	High	1
Infrastructure	Perquimans Infrastructure Action 4: Drainage Improvements – Perquimans River	High	2
Infrastructure	Perquimans Infrastructure Action 3: Drainage Improvements – Bear Swamp Watershed	High	3
Infrastructure	Perquimans Infrastructure Action 2: Drainage Improvements – Bagley Swamp Watershed	High	4
Infrastructure	Perquimans Infrastructure Action 1: Drainage Improvements – Burnt Mill Watershed	High	5

Pillar	Action Name	Priority	Overall Ranking
Environment	Perquimans Environmental Action 4: Countywide Removal of Beaver Dams	High	6
Environment	Perquimans Environmental Action 2: Countywide Installation of Weather Stations	Medium	7
Environment	Perquimans Environmental Action 3: Countywide Mosquito Abatement Program	Medium	8
Economic Development	Perquimans Economic Development Action 1: Install Detailed River Gages	Medium	9

Table 4. Projects by Rank

On the following pages, we have organized the projects and actions by pillar. Within each pillar, the projects are grouped by county priority. Please note that maps are provided for all projects that have a specific location within the county. Projects without maps are county-wide projects that will benefit citizens throughout the county.

## Housing Strategies

Perquimans County did not select any high, medium or low priority housing strategies.

## Economic Development Strategies

Perquimans County selected one medium priority economic development strategy. They did not select a high or low priority economic development strategy.

### Medium Priority Economic Development Strategies

Pillar	Action Name	Priority	Overall Ranking
Economic Development	Perquimans Economic Development Action 1: Installation of Detailed River Gages	Medium	9

Table 5. Perquimans Medium Priority Economic Development Summary

This project represents the economic development strategy that Perquimans County indicated is of a medium priority to address. Additional detail on the project can be found below:

- **Install Detailed River Gages:** This project involves the installation of one detailed river gage at undetermined locations on each of three rivers – Little, Yeopin, and Perquimans. The gage would provide real-time river stage information as water levels begin to rise. The gages would also include air temperature, barometric pressure, humidity, rain accumulation, wind direction, and wind velocity.
- **This is a county-wide project so no project area map is included.**

## Economic Development Action 1: Installation of Detailed River Gages

**County:** Perquimans

**Priority Grouping:** Medium Priority

**Priority Ranking:** 9

**Project Timeframe:** 12 months

**Location:** Little River, Perquimans River, and Yeopin River

**Project Summary:** The installation of detailed river gages on the Little, Perquimans, and Yeopin Rivers would provide real-time river stage information as water levels begin to rise. The detailed river gages would include air temperature, barometric pressure, humidity, rain accumulation, water elevation, and wind direction and velocity.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	The installation of the detailed river gages will provide real-time weather and river data that will benefit emergency management actions and allow for more efficient actions.	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.	This is a relatively inexpensive project that will enhance forecasts of wind weather conditions and rising river levels that determine school closings emergency management activities and residential evacuations.	Agree
For how long will this solution be effective?	Between 11 and 30 years	Agree
How effective is the risk reduction?	<50 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?	Less than 25%	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?	The project will have no direct impacts to the environment.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	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

## Infrastructure Strategies

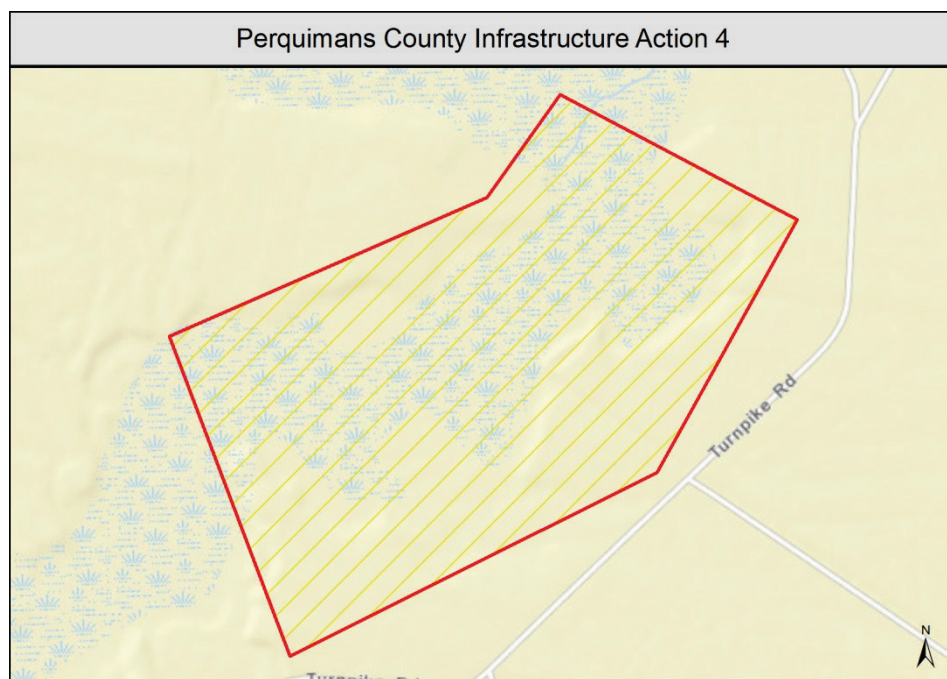
### High Priority Infrastructure Strategies

Pillar	Action Name	Priority	Overall Ranking
Infrastructure	Perquimans Infrastructure Action 4: Drainage Improvements – Perquimans River	High	2
Infrastructure	Perquimans Infrastructure Action 3: Drainage Improvements – Bear Swamp Watershed	High	3
Infrastructure	Perquimans Infrastructure Action 2: Drainage Improvements – Bagley Swamp Watershed	High	4
Infrastructure	Perquimans Infrastructure Action 1: Drainage Improvements – Burnt Mill Watershed	High	5

**Table 6. Perquimans High Priority Infrastructure Summary**

These projects represent the infrastructure strategies that Perquimans County indicated are the highest priority to address. Additional detail can be found below:

- Drainage Improvements – Perquimans River:** This project will remove a significant amount of debris, including trees and woody vegetation, from Hurricane Matthew and previous flood events, from the river. This has reduced the flow capacity while blocking drainage from tributaries and navigation. If the debris is not removed, it could break away and block culverts and bridge openings downstream. The clearing and snagging project includes 30,000 linear feet of clean-up. This will increase flow capacity and drainage and remove navigation restrictions.



**Figure 15. Infrastructure Action 4: Drainage Improvements – Perquimans River**

## Infrastructure Action 4: Debris Removal - Perquimans River

**County:** Perquimans

**Priority Grouping:** High Priority

**Priority Ranking:** 2

**Project Timeframe:** 12 months

**Location:** Perquimans River

**Project Summary:** Remove a significant amount of debris, including trees and woody vegetation, from Hurricane Matthew and previous flood events, from the river. This has reduced the flow capacity while blocking drainage from tributaries and navigation. The clearing and snagging project includes 30,000 linear feet of clean-up. This will increase flow capacity and drainage and remove navigation restrictions.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	The debris removal will increase the flow and stabilize the banks of the river and reduce flow restrictions. There has been a build-up of debris from Hurricane Matthew and previous heavy rain and runoff 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.	The benefits will include the reduction of overbank flooding and road closures	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?	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?	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?	The project will have no direct impacts to the environment outside of reduced overbank flooding. Habitats will be maintained and sediment loads into the river will be reduced.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	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

- **Drainage Improvements – Bear Swamp Watershed:** This project will remove debris from Hurricane Matthew and previous flood events within the Bear Swamp Watershed. The debris has reduced the flow capacity while blocking drainage from tributaries and navigation. If the debris is not removed, it could break away and block culverts and bridge openings downstream. The clearing and snagging project includes 24,000 linear feet of clean-up. This will increase flow capacity and drainage and remove navigation restrictions.

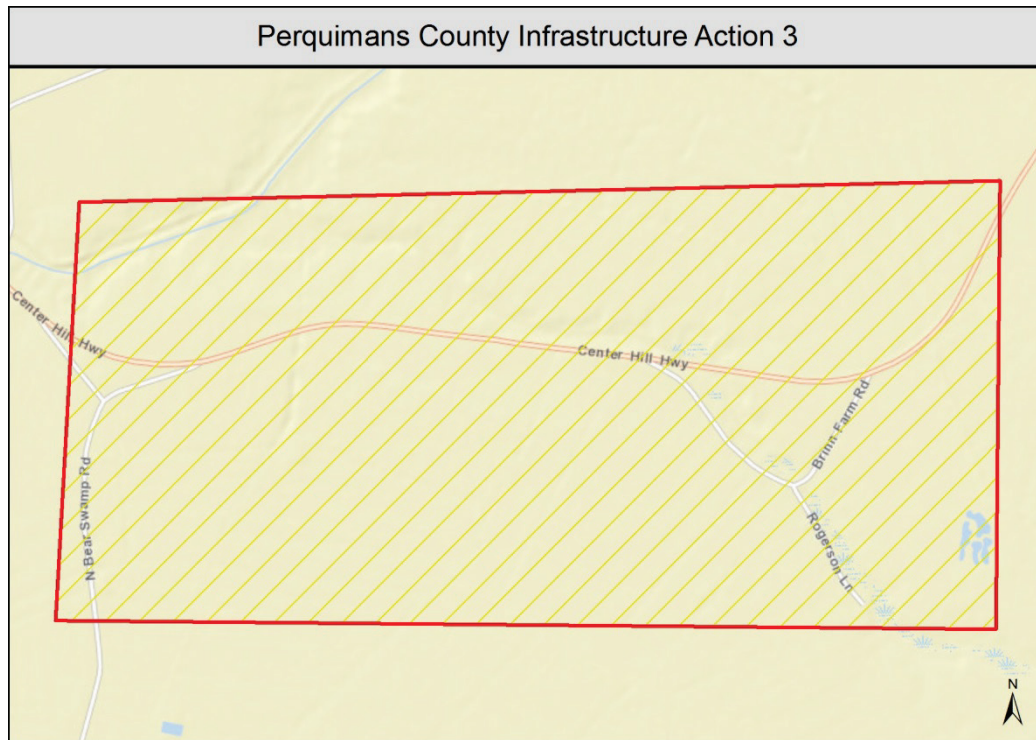


Figure 16. Infrastructure Action 3: Drainage Improvements – Bear Swamp Watershed



## Infrastructure Action 3: Debris Removal - Bear Swamp

**County:** Perquimans

**Priority Grouping:** High Priority

**Priority Ranking:** 3

**Project Timeframe:** 12 months

**Location:** Bear Swamp Watershed

**Project Summary:** Remove debris from Hurricane Matthew and previous flood events that has accumulated in the watershed. This has reduced the flow capacity in the waterways and caused overbank flooding. The clearing and snagging project includes 24,000 linear feet of clean-up. This will increase flow capacity and reduce flooding.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	The debris removal will increase the flow and stabilize the banks of local waterways to reduce sediment transport and flow restrictions. There has been a build-up of debris from Hurricane Matthew and previous heavy rain and runoff 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.	The benefits will include the reduction of overbank flooding and road closures.	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?	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?	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?	The project will have no direct impacts to the environment outside of reduced overbank flooding. Habitats will be maintained and sediment loads into local waterways will be reduced.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	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

- **Drainage Improvements – Bagley Swamp Canal:** This project will remove debris from Hurricane Matthew and previous flood events within the Bagley Swamp Canal. The debris has reduced the flow capacity while blocking drainage from tributaries and navigation. If the debris is not removed, it could break away and block culverts and bridge openings downstream. The clearing and snagging project includes 15,000 linear feet of clean-up. This will increase flow capacity and drainage and remove navigation restrictions.

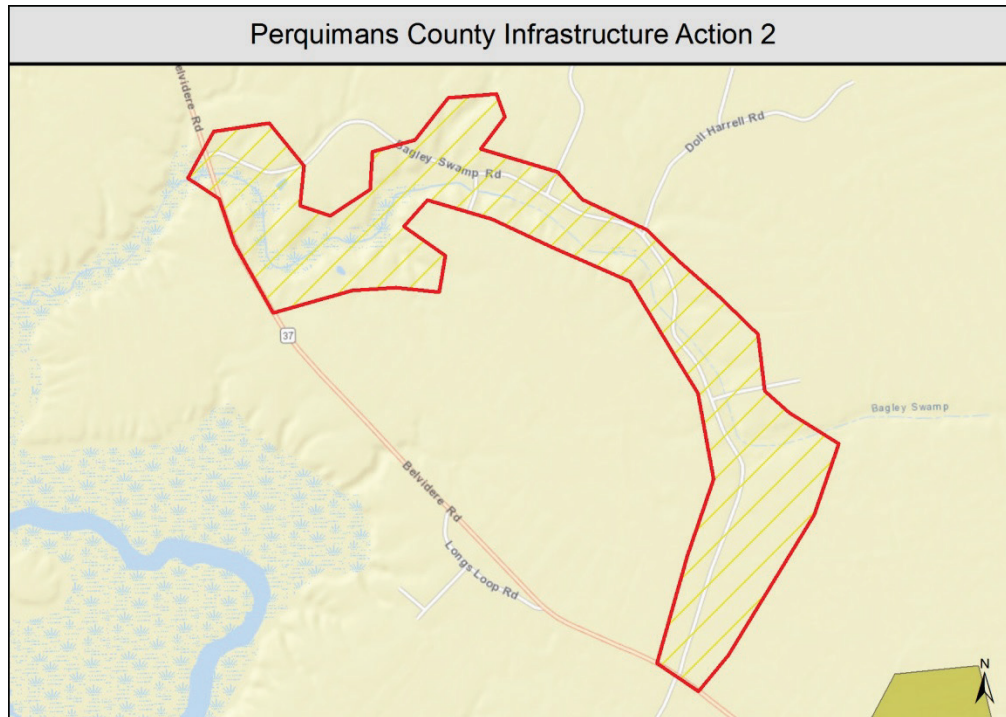


Figure 17. Infrastructure Action 2: Drainage Improvements – Bagley Swamp Canal

## Infrastructure Action 2: Debris Removal - Bagley Swamp Canal

**County:** Perquimans

**Priority Grouping:** High Priority

**Priority Ranking:** 4

**Project Timeframe:** 12 months

**Location:** Bagley Swamp Canal

**Project Summary:** This project includes the removal of debris from Hurricane Matthew and previous flood events that has accumulated in the canal. This has reduced the flow capacity in the canal and caused overbank flooding. The clearing and snagging project includes 15,000 linear feet of clean-up. This will increase flow capacity and help navigation.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	The debris removal will increase the flow and stabilize the banks of the canal to reduce sediment transport and flow restrictions. There has been a build-up of debris from Hurricane Matthew and previous heavy rain and runoff 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.	The benefits will include the reduction of overbank flooding and road closures.	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)?	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?	Less than 25%	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?	The project will have no direct impacts to the environment outside of reduced overbank flooding.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	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

- **Drainage Improvements – Burnt Mill Watershed:** This project includes the replacement of culverts that washed out during Hurricane Matthew plus erosion control measures and debris removal. The culverts, erosion control and debris removal will increase the flow and stabilize the bank to reduce sediment transport or flow restrictions. If the debris is not removed, it could break away and block culverts and bridge openings downstream.

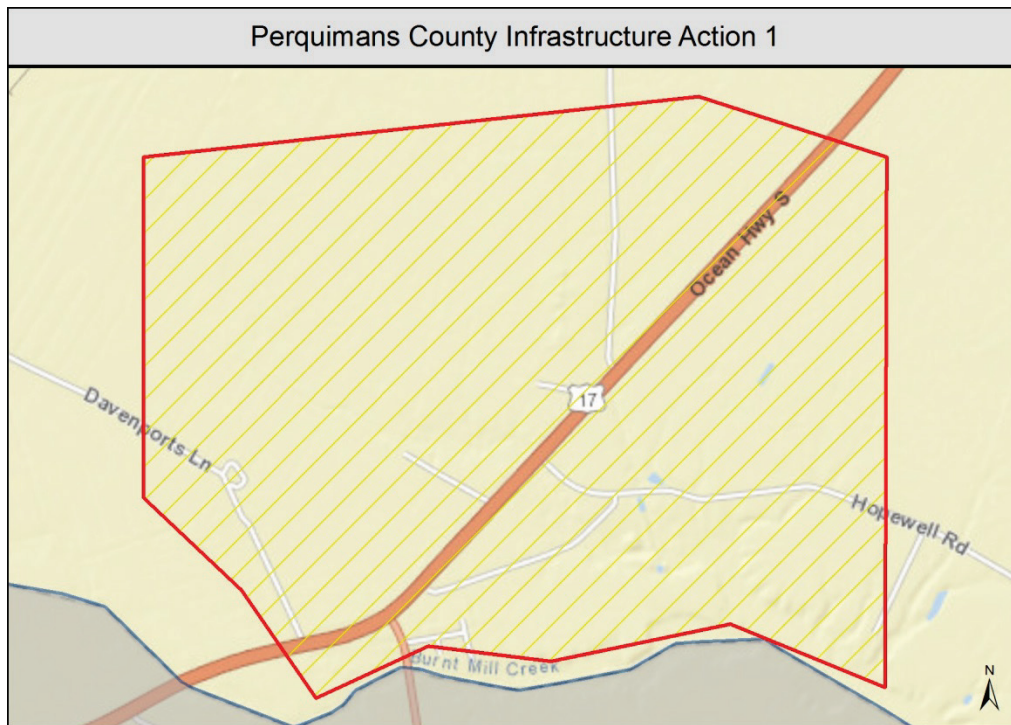


Figure 18. Infrastructure Action 1: Drainage Improvements – Burnt Mill Watershed



## Infrastructure Action 1: Drainage Improvements – Burnt Mill Watershed

**County:** Perquimans

**Priority Grouping:** High Priority

**Priority Ranking:** 5

**Project Timeframe:** 12 months

**Location:** Burnt Mill Watershed

**Project Summary:** This project includes the replacement of culverts that washed out during Hurricane Matthew plus erosion control measures and debris removal. The culverts, erosion control and debris removal will increase the flow and stabilize the bank to reduce sediment transport or flow restrictions.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	The culverts erosion control and debris removal will increase the flow and stabilize the banks of local waterways to reduce sediment transport and flow restrictions. There has been a build-up of debris from Hurricane Matthew and previous heavy rain and runoff 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.	The benefits will include the reduction of overbank flooding road closures and the cost and time for detours due to road closures.	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)?	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?	Less than 25%	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?	The project will have no direct impacts to the environment outside of reduced overbank flooding.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	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

## Environmental, Ecosystem and Agricultural Strategies

### High Priority Environmental Strategies

Pillar	Action Name	Priority	Overall Ranking
Environment	Perquimans Environmental Action 1: Wetland Bank Restoration	High	1
Environment	Perquimans Environmental Action 4: Countywide Removal of Beaver Dams	High	6

Table 7. Perquimans Medium Priority Environmental Summary

These projects represents the environmental strategies that Perquimans County indicated are of a high priority to address. Additional detail can be found below:

- **Wetland Bank Restoration:** During Hurricane Matthew, 500 linear feet of wetland bank washed out and sediment from adjacent agricultural lands was deposited into the wetland. The wetland restoration project will restore the bank and the wetland to their previous conditions while also preventing additional sediment migration into the wetland.

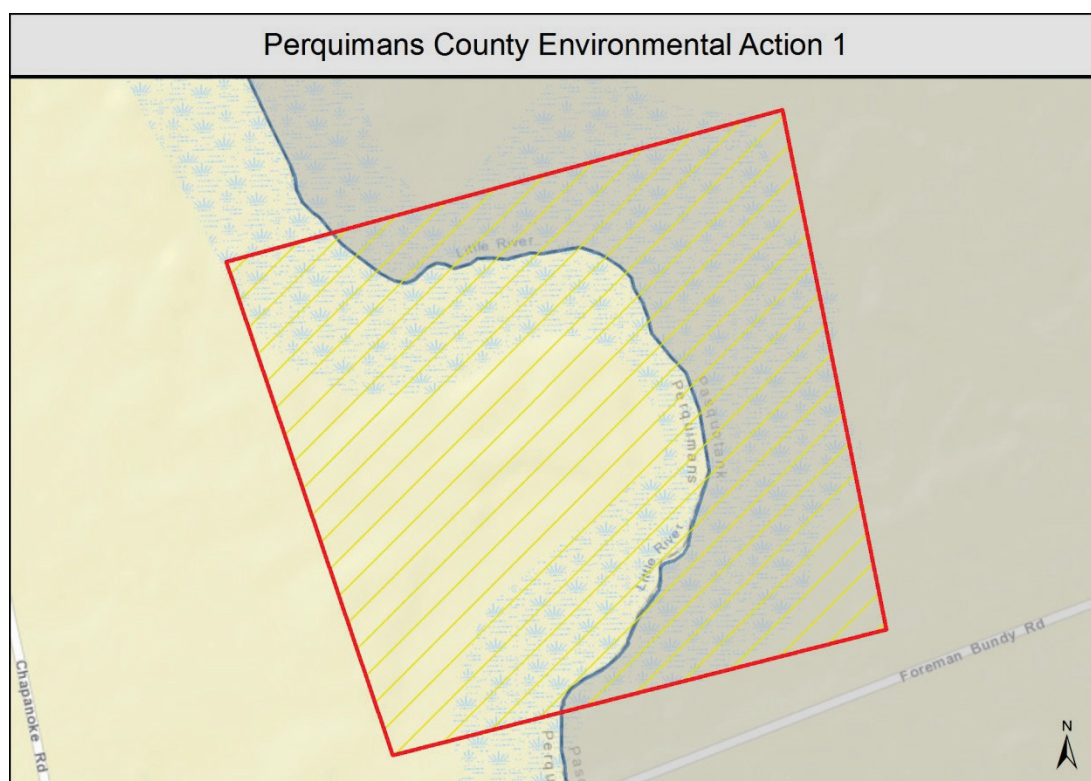


Figure 19. Environmental Action 1: Wetland Bank Restoration

## Environmental Action 1: Wetland Bank Restoration

**County:** Perquimans

**Priority Grouping:** High Priority

**Priority Ranking:** 1

**Project Timeframe:** 12 months

**Location:** Little River Watershed - Wetland Bank Restoration

**Project Summary:** During Hurricane Matthew, 500 linear feet of wetland bank washed out and sediment from agricultural lands washed into the wetland. The wetland restoration project will restore the wetland to its previous condition while also preventing additional sediment migration into the wetland.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	During Hurricane Matthew 500 linear feet of wetland bank washed out and sediment from agricultural lands washed into the wetland. The project will restore an existing high quality wetland prevent further negative impacts on the existing wetland bank and prevent additional sediment from entering the waterway.	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 benefits will include the reduction of overbank flooding and sediment flow into the waterway while maintaining a high quality wetland.	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?	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?	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?	The project will restore an existing high quality wetland and prevent additional sediment from entering the waterway.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	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

- **Countywide Removal of Beaver Dams:** There are an unknown number of beaver dams throughout the County that make existing flood situations worse by restricting flow and increasing water levels. In addition, debris from the dams could break loose and block downstream culverts or bridge openings and further restrict flow. The beavers would be relocated to avoid rebuilding of the dams.
- **This is a county-wide project so no project area map is included.**



## Environmental Action 4: Countywide Removal of Beaver Dams

**County:** Perquimans

**Priority Grouping:** High Priority

**Priority Ranking:** 6

**Project Timeframe:** 12-24 months

**Location:** Countywide

**Project Summary:** Removal of beaver dams due to an unknown number of beaver dams throughout the County that make existing flood situations worse by restricting flow and increasing water levels. In addition, debris from the dams could also block downstream culverts or bridge openings and further restrict flow. The beavers would be relocated to avoid rebuilding of the dams.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not address an unmet need that was created by damage from Hurricane Matthew but has been identified as a need by the community.	N/A
Consistent with existing plans (describe points of intersection/departure)	This project type is not mentioned in the Perquimans County portion of Section 7 on Mitigation Strategies of the Albemarle Regional Hazard Mitigation Plan (adopted 05/12/15) but is consistent with overall quality of life goals.	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.	There are no benefits or impacts to the county economy.	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?	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?	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?	The conveyance of existing waterways will be increased and the debris loads in the waterways that could block culverts or bridge openings will be reduced.	N/A
What is the capability of the local government to administer this project?	High	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

## Medium Priority Environmental Strategies

Pillar	Action Name	Priority	Overall Ranking
Environment	Perquimans Environmental Action 2: Countywide Installation of Weather Stations	Medium	7
Environment	Perquimans Environmental Action 3: Countywide Mosquito Abatement Program	Medium	8

**Table 8. Perquimans Medium Priority Environmental Summary**

These projects represents the environmental strategies that Perquimans County indicated are of a medium priority to address. Additional detail can be found below:

- **Countywide Installation of Weather Stations:** This project involves the installation of weather stations, possibly at county schools or other county-owned facilities. The stations would provide on-demand weather data for temperature, barometric pressure, humidity, rainfall accumulation and wind direction and velocity. The wind direction and velocity are critical when determining school closures and evacuation notices.
- **This is a county-wide project so no project area map is included.**

## Environmental Action 2: Countywide Installation of Weather Stations

**County:** Perquimans

**Priority Grouping:** Medium Priority

**Priority Ranking:** 7

**Project Timeframe:** 12 months

**Location:** Countywide

**Project Summary:** The installation of weather stations, possibly at schools or county owned facilities. The stations would provide on-demand weather data for temperature, barometric pressure, humidity, rainfall accumulation and wind direction and velocity. The wind direction and velocity are critical when determining school closures and evacuation notices.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not address an unmet need created by damage from Hurricane Matthew.	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 stations would provide on-demand weather data for temperature barometric pressure humidity rainfall accumulation and wind direction and velocity. The wind direction and velocity are critical when determining school closures and evacuation notices.	Agree
For how long will this solution be effective?	Between 11 and 30 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)?	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?	Minimal to low 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?	The project will have no direct impacts to the environment.	N/A
What is the capability of the local government to administer this project?	High	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

- **Countywide Mosquito Abatement Program:** The program would be used on an as-needed basis around the County to prevent the growth of mosquito populations due to significant areas of standing water after heavy rains, tropical storms or hurricanes. A previous 9-county program was discontinued due to funding issues and the County has been looking for a funding source for several years.
- **This is a county-wide project so no project area map is included.**



## Environmental Action 3: Countywide Mosquito Abatement Program

**County:** Perquimans

**Priority Grouping:** Medium Priority

**Priority Ranking:** 8

**Project Timeframe:** 12 months

**Location:** Countywide

**Project Summary:** A mosquito abatement program be used on an as-needed basis around the County to prevent the growth of mosquito populations due to significant areas of standing water after heavy rains, tropical storms or hurricanes. A previous 9-county program was discontinued due to funding issues.

Question	Response	Disposition
Articulate how this project addresses an unmet need that has been created by damage from Hurricane Matthew.	This project does not meet an unmet need created by damage from Hurricane Matthew.	N/A
Consistent with existing plans (describe points of intersection/departure)	This proposed project does not meet any of the identified objectives identified in Section 7 for Perquimans County within the Albemarle Regional Hazard Mitigation Plan.	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.	There will be no direct benefits or impacts to the county economy.	Agree
For how long will this solution be effective?	Less than 10 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?	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?	Minimal to low 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?	The project will improve health conditions for many county residents while also reducing the potential spread of disease by mosquitos.	N/A
What is the capability of the local government to administer this project?	High	Agree
What is the financial range of this project?	\$0- \$50K	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

## 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 the 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.