



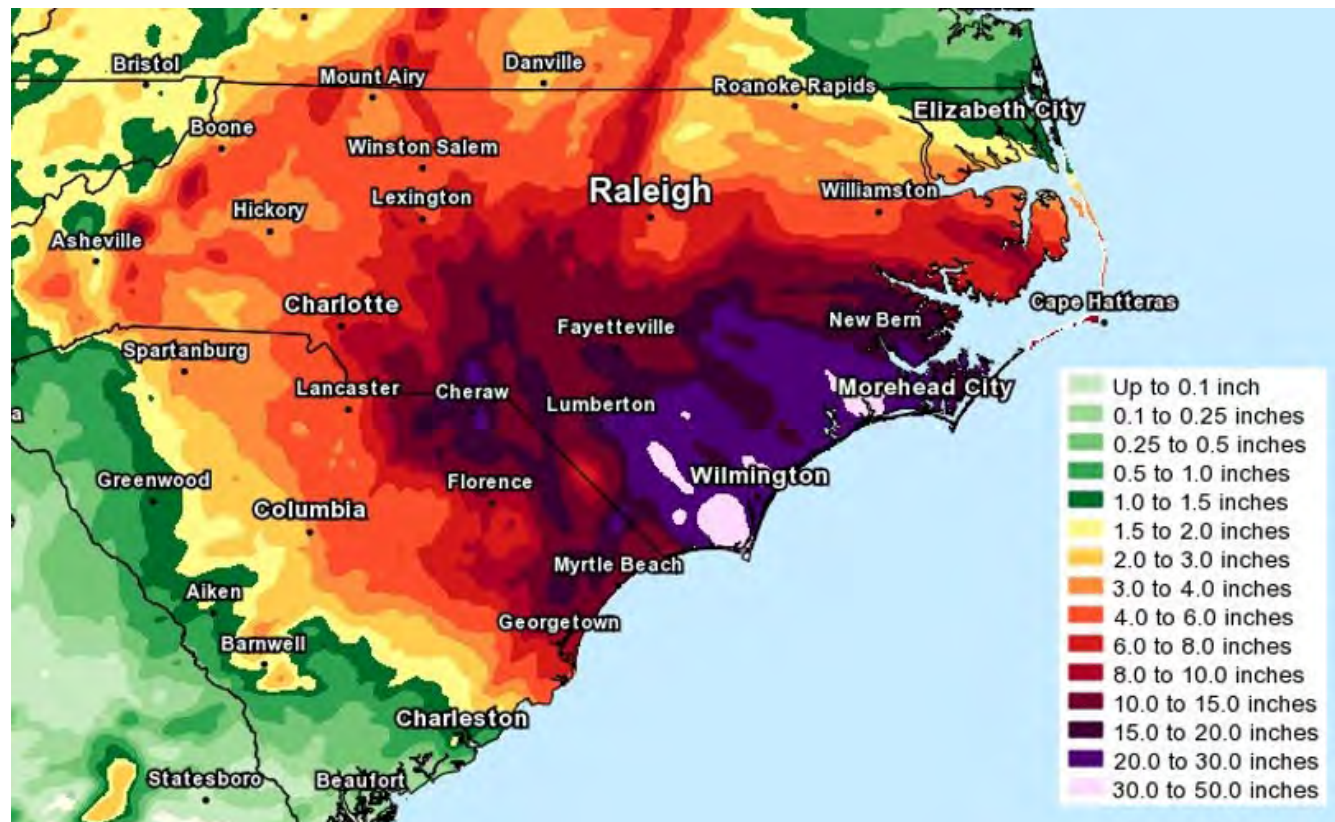
STRENGTHENING FLOOD RESILIENCE IN EASTERN NORTH CAROLINA

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BACKGROUND

With three major hurricanes (Matthew, Florence, and Dorian) hitting the State of North Carolina in three of the past four years, there is a new urgency to strengthen the state’s resiliency to future storms, especially in eastern North Carolina. Combined these storms, and in particular the flooding, decimated the state resulting in dozens of deaths, damage to thousands of structures, and billions of dollars in economic loss.

In 2019 the North Carolina General Assembly approved disaster recovery legislation (Senate bill 429, Session Law 2019-224), one section of which directed \$2 million to be used by the North Carolina Policy Collaboratory to study flooding and resiliency. Specifically, the legislation charged the Collaboratory to study flooding and resiliency against future storms in eastern North Carolina and develop an implementation plan with recommendations.



Observed precipitation from Hurricane Florence. Map via the National Weather Service.

Pursuant to the legislation the Collaboratory is coordinating a diverse team of university researchers to address flooding and resiliency issues in a comprehensive manner. The study includes five overarching focal areas:

- Floodplain buyouts
- Infrastructure, such as water treatment plants and the electric grid
- Financial risk, including new flood mapping and a financial analysis of at-risk structures
- Natural systems, including wetlands and stormwater; and
- Public Health

The Collaboratory is charged with delivering a final report to the North Carolina General Assembly's Joint Legislative Emergency Management Oversight Committee no later than December 1, 2020.

PROJECT OVERVIEW

As part of the study the research team will be conducting a number of distinct projects, including:

- Creating models for estimating the federal, state, and local costs **attributed to designing and implementing floodplain buyouts**, which are the acquisition and removal of structures in flood prone areas
- Examining alternative approaches to **financing floodplain buyouts**
- Analyzing the **financial risk** to residents and community banks and recommending solutions to manage the risk.
- Evaluating the capacity of large-scale natural infrastructure implementation projects by comparing the **costs and benefits of investments in natural infrastructure**, and identifying community needs relative to flood mitigation.
- Utilizing **flood risk maps** to determine how elevated water levels during flood events impact stormwater infrastructure
- Establishing **baseline water quality parameters** to develop tools that will allow for managers to respond and manage threats to public health stemming from future storm events
- Recommending pathways to **improve grid resiliency**
- Assessing the resiliency of previously installed **stormwater control measures** to identify both practices and design features that are successful and cost-effective
- Identifying resiliency needs and the challenges associated with addressing these needs in order to make policy recommendations for **incentivizing resilient infrastructure**
- Analyzing current regulations governing state-level wetlands protections
- Evaluating the current capabilities of **modeling compound flooding**
- **Modeling flooding** in the Lumber, Neuse, and Cape Fear river basins
- Investigating an integrated method for real time **inundation mapping**

Institutions conducting research projects as part of this study include:

University of North Carolina at Chapel Hill

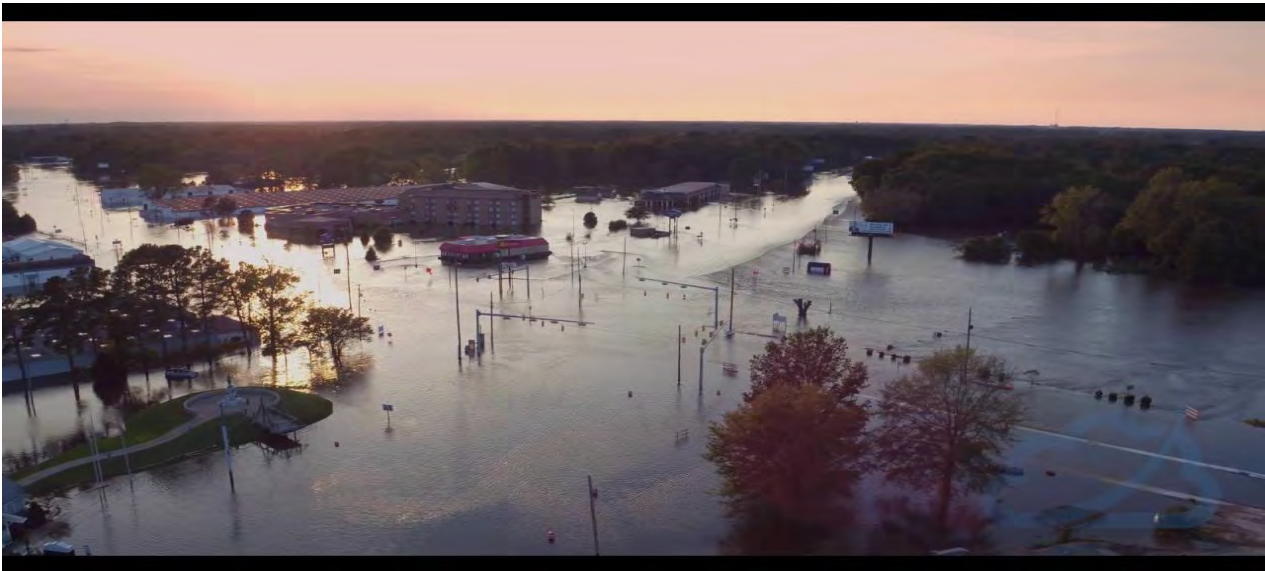
- Center on Financial Risk in Environmental Systems
- Department of City and Regional Planning
- Department of Geological Sciences
- Gillings School of Global Public Health
- Institute for the Environment
- Institute of Marine Sciences
- School of Government's Environmental Finance Center
- School of Law

North Carolina State University

- Department of Biological and Agricultural Engineering
- Department of Civil, Construction, and Environmental Engineering
- Department of Forestry and Environmental Resources
- NC Sea Grant

Duke University – Department of Civil and Environmental Engineering

North Carolina A&T University– Department of Built Upon Environment



Flooding in Kinston, North Carolina after Hurricane Matthew, Nelson Aerial Productions.

FUTURE ACTIONS

A component of research projects will be working with and receiving input from local governments and communities in the coastal plain. Consequently, engagement with stakeholders will be critical to the outcomes of the study. During the course of 2020 the study team plans to share background information about the research through a variety of means, including public forums.