



Triangle Regional Resilience Partnership Resilience Assessment

RESILIENCE: PLANNING AND INVESTING TODAY FOR A BETTER FUTURE

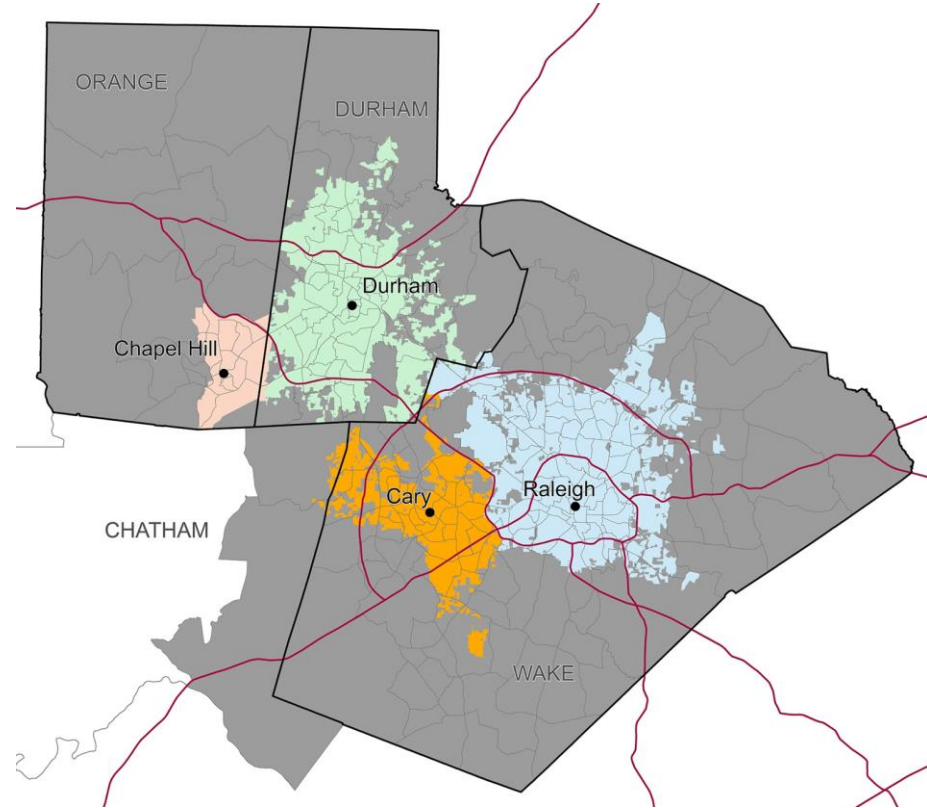
Triangle Regional Resilience Partnership



Raleigh



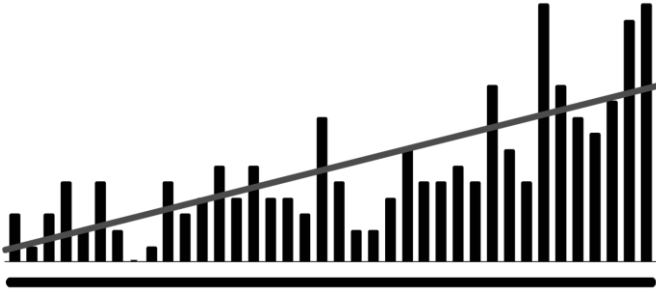
TOWN of CARY



The challenge our cities face



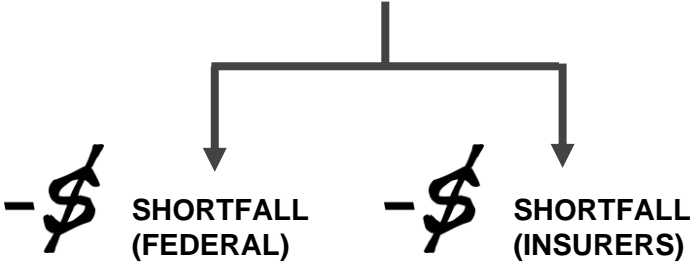
URBAN GROWTH



BILLION DOLLAR DISASTERS



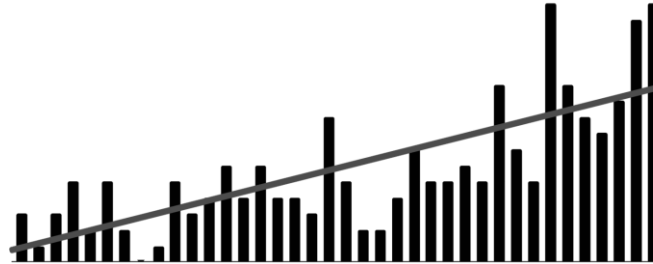
RISKIER INVESTMENTS



The impact of Hurricane Florence in North Carolina



URBAN GROWTH



BILLION DOLLAR DISASTERS

\$17 Billion Impact to NC



RISKIER INVESTMENTS

\$3.3 Billion Federal
and State

\$4.8 Billion Private
Insurance

\$8.8 CURRENTLY NOT COVERED

Monetary impact of Hurricane Florence by asset

Data specific to North Carolina

\$5.7 billion

on businesses (commercial properties)

\$5.6 billion

on homes (residential properties)

\$2.4 billion

on agriculture

\$3.3 billion

on other properties

How is the Triangle Region changing?

The region is experiencing certain trends, primarily:



Increasing extreme precipitation events that lead to more frequent local flooding



Increasing temperatures and temperature variability with linked extreme heat events



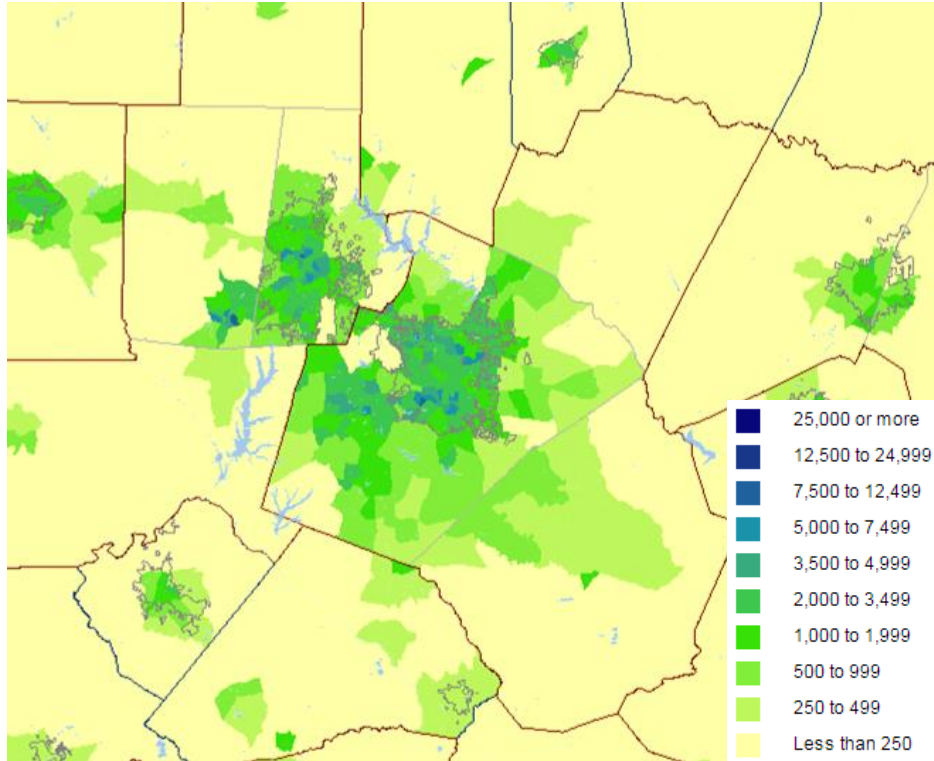
Increasing frequency and duration of drought conditions that leads to water shortage and wildfire



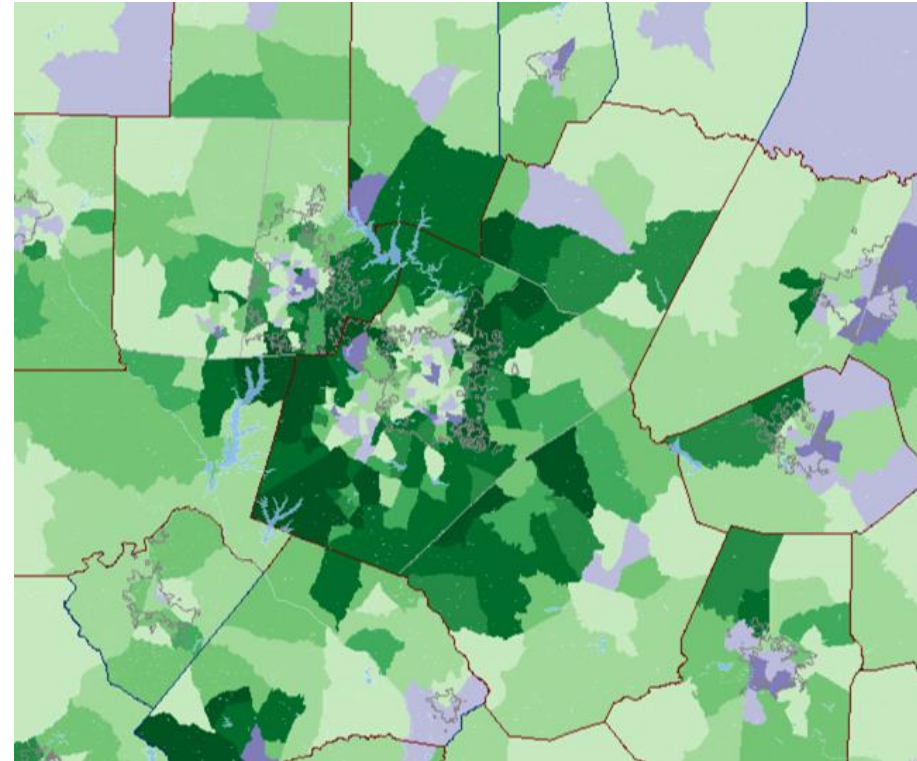
Robust population growth leading to an increasing demand for resources and services and increasing social vulnerability

Robust regional population growth

Population Density (2010)



Population Growth (2000–2010)



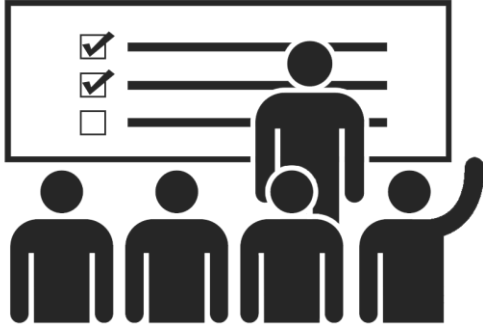
How do you assess and build resilience?



RISK ANALYSIS
FRAMEWORK



QUANTIFIED
ASSESSMENT



IMPLEMENTABLE OPTIONS



Risk Analysis Framework: Steps to Resilience

1 Explore Threats

2 Assess Vulnerability & Risks

3 Investigate Options

4 Prioritize & Plan

5 Take Action



U.S. Climate
Resilience Toolkit

toolkit.climate.gov



Quantified assessment: Exposure \rightarrow Vulnerability/Risk

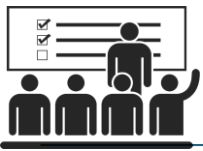
Vulnerability

- Potential impact
- Adaptive capacity

Risk

- Probability
- Consequence





Options: Target all aspects of vulnerability



Reduce Exposure



Build Adaptive Capacity

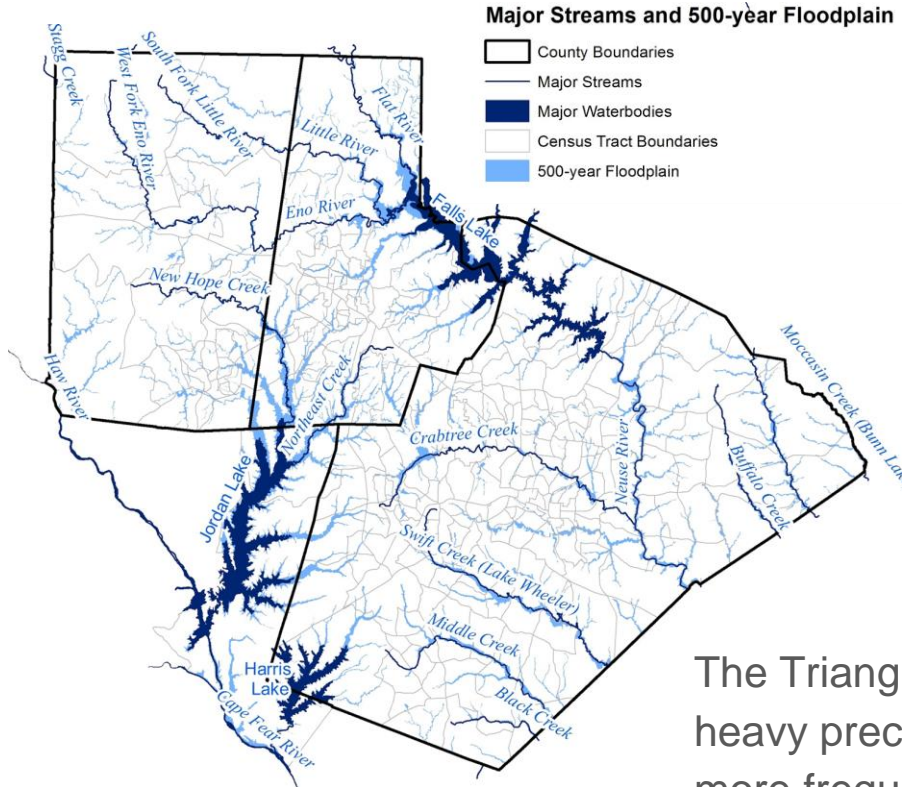


Protect Sensitive Systems or Populations

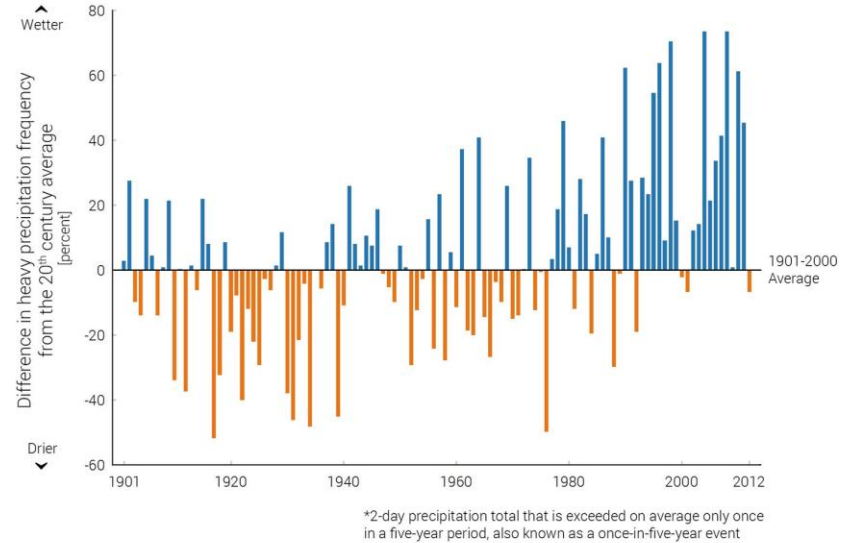


Assist with Response and Recovery

Flooding

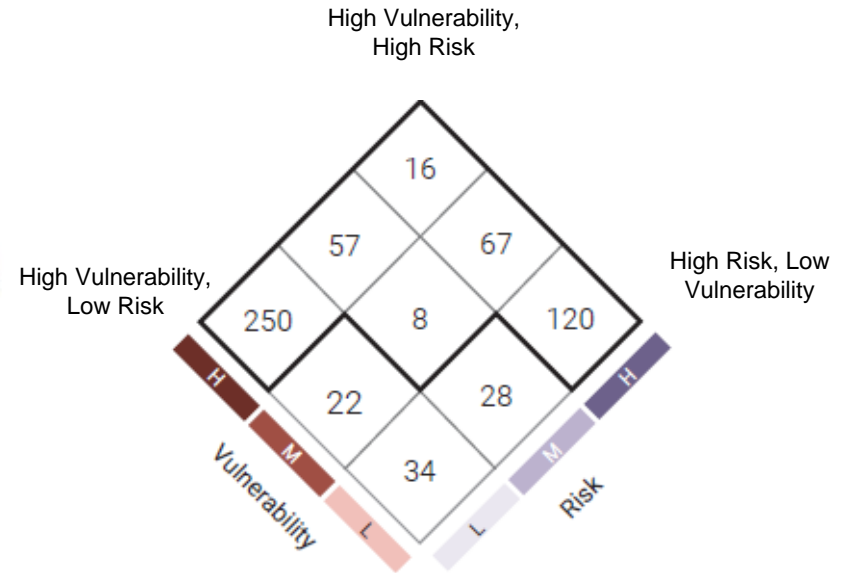
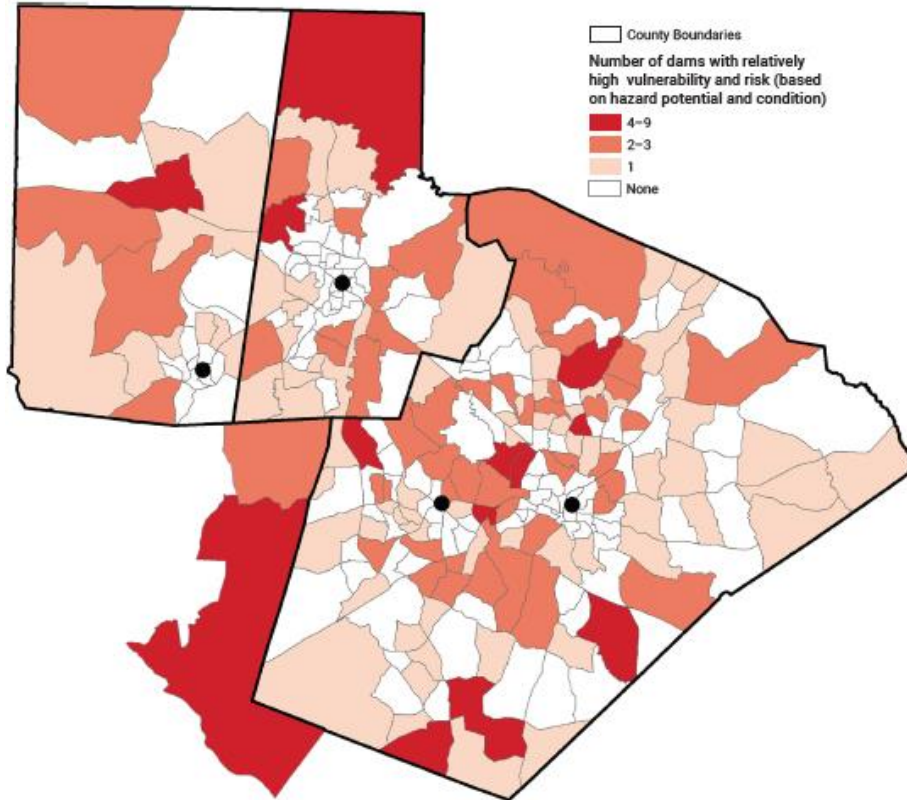


Annual Frequency of Extreme Heavy Precipitation Events* in the Contiguous United States



The Triangle region is very exposed to flooding, and heavy precipitation events are becoming more severe and more frequent

Dams and Flooding



Water Infrastructure and Flooding

Figure 70. Exposure of Major Water Lines to Flooding

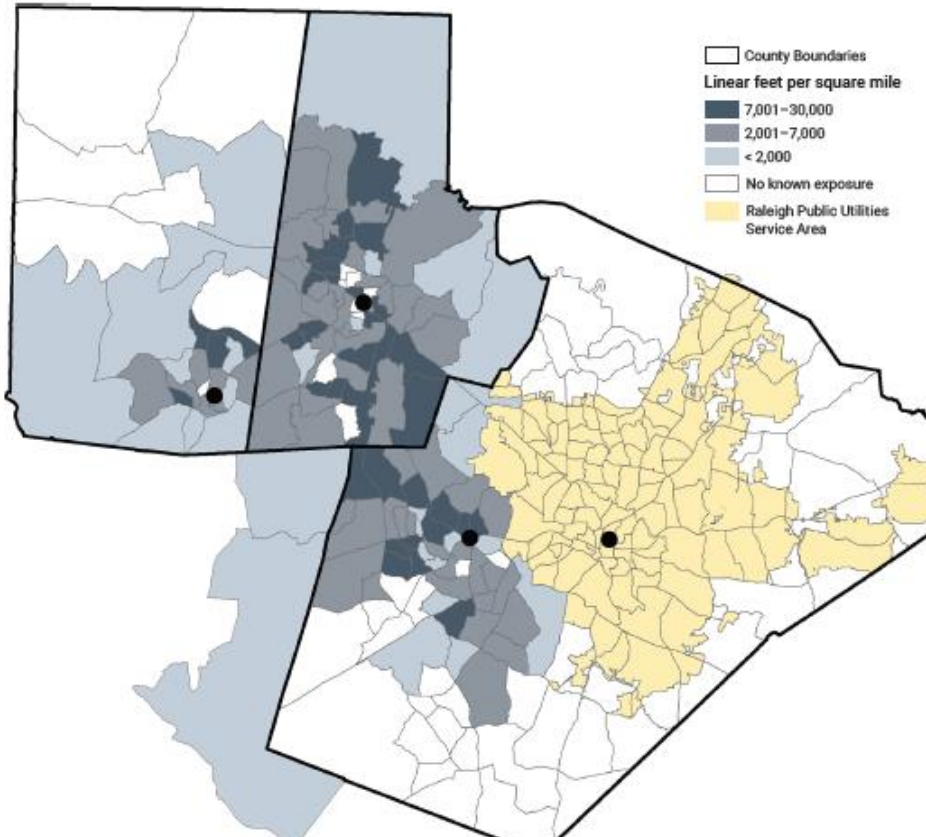
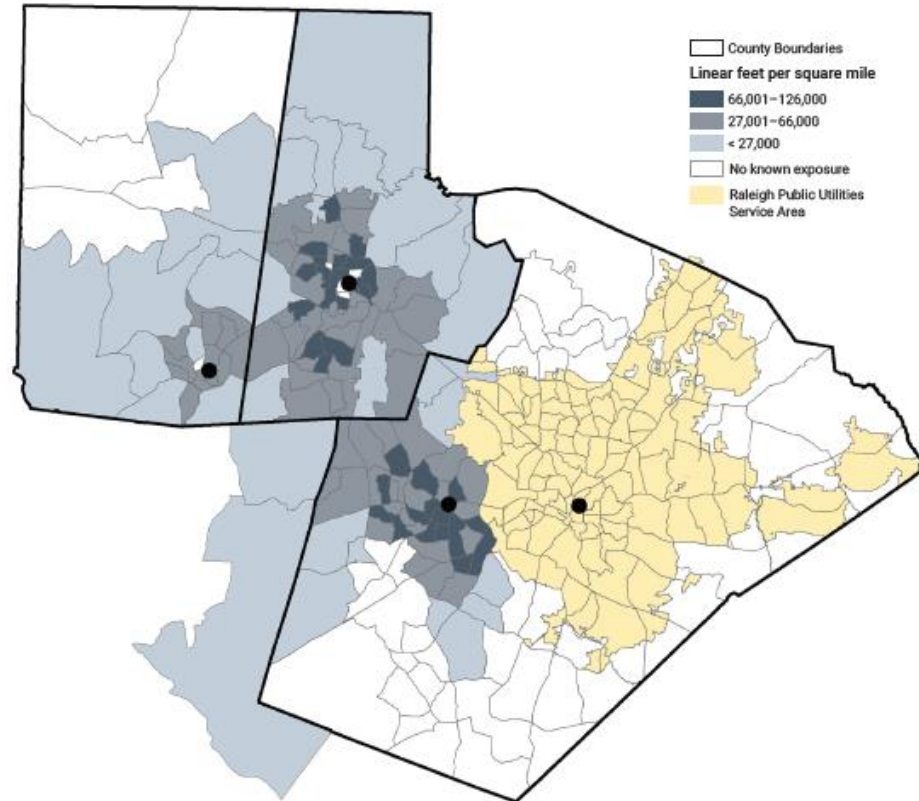


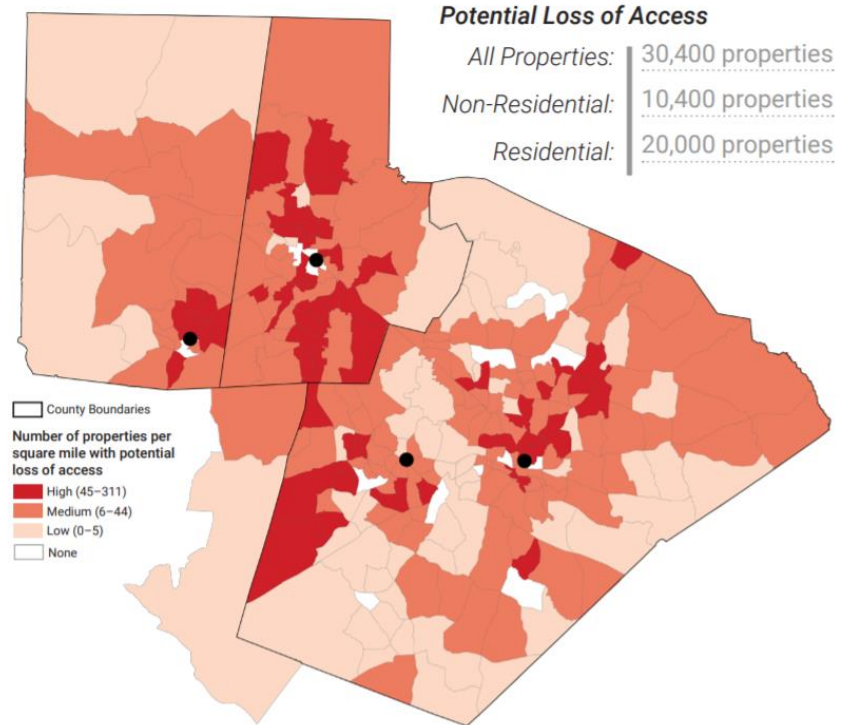
Figure 71. Exposure of Minor Water Lines to Flooding



Road access

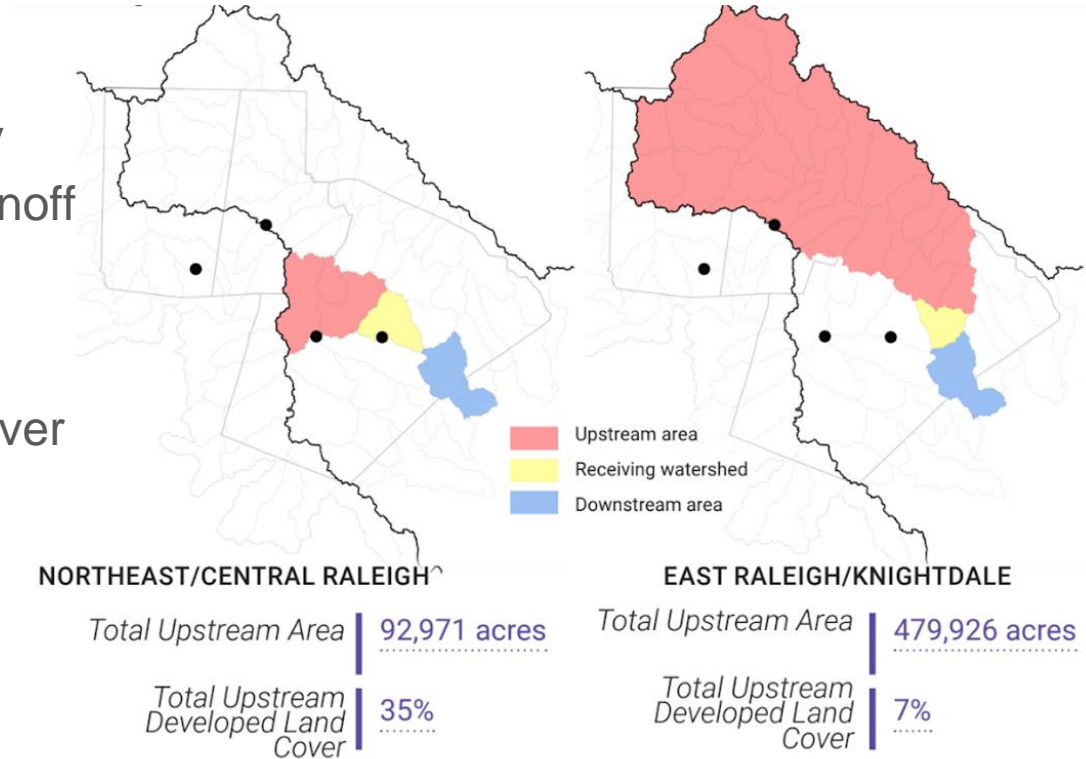


Potential for loss of road access is widespread throughout the region



Minor flooding

- The threat of minor flooding arises from extreme or heavy precipitation that results in runoff and erosion
- Heavily influenced by the amount of developed land cover and impervious surfaces that contribute to runoff
- Impacts stormwater systems





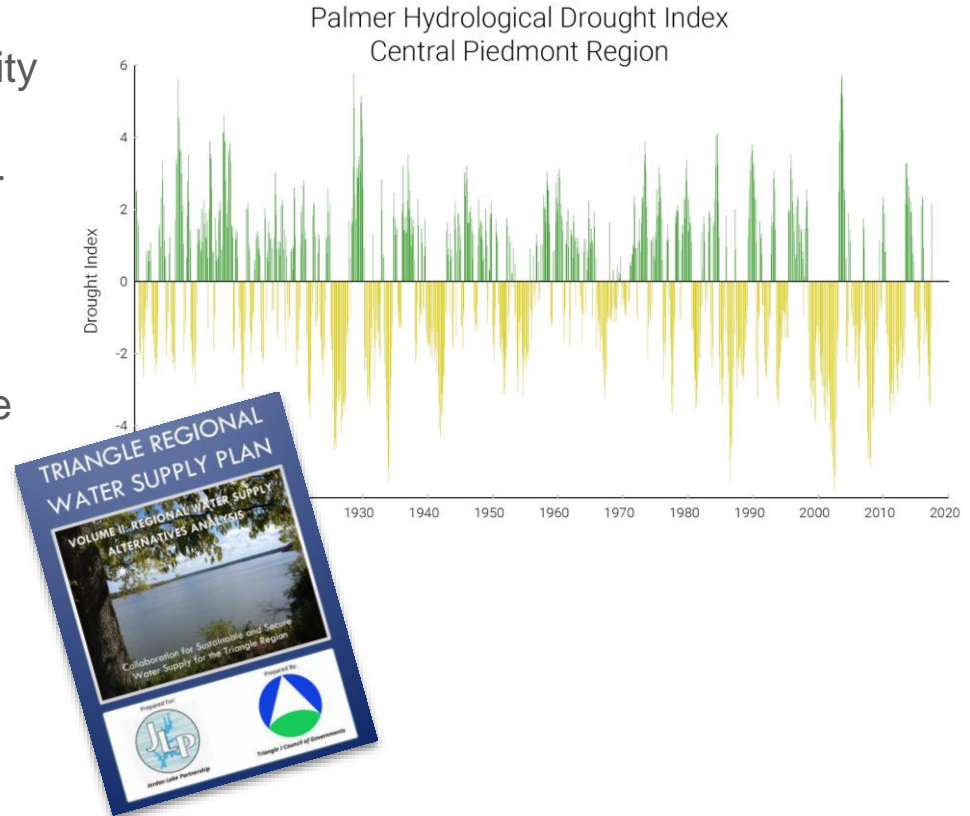
OPTIONS

Build resilience for flooding

- For areas of greatest risk, work locally to develop implementable options, and share these strategies regionally to develop best practices
- Create green stormwater infrastructure incentives and/or policies for new development
- Develop cross-boundary watershed solutions through comprehensive regional collaboration
- Implement a stream monitoring system for both regular monitoring and to alert emergency management about rising water during heavy rain events

Water shortage and water supply

- Changes in the frequency and severity of drought can and will affect the quality and quantity of regional water supplies
- The region has a strong history of partnership, such as the Jordan Lake Partnership and other efforts
- Investments in planning and infrastructure have resulted in the region having the capacity to meet a certain amount of supply needs





OPTIONS

Build resilience for water shortage

- Utilize regional water supply planning for long-term demands
 - Enhance the capacity of regional water system inter-connects, and validate and maintain them regularly
-



Next steps - Take Action!

- Incorporate these resilience concepts and potential options and strategies into local plans and planning efforts
- Local jurisdictions should evaluate options and strategies for feasibility, determine specific tasks to approve/implement/maintain them, and monitor/evaluate results
- Continue to collaborate regionally to ensure the resilience of the people, culture, and unique features of the Triangle Region



If interested, both the Executive Summary and the Full Assessment Report are available at:

<http://www.tjcog.org/regional-resiliency-assessment.aspx>