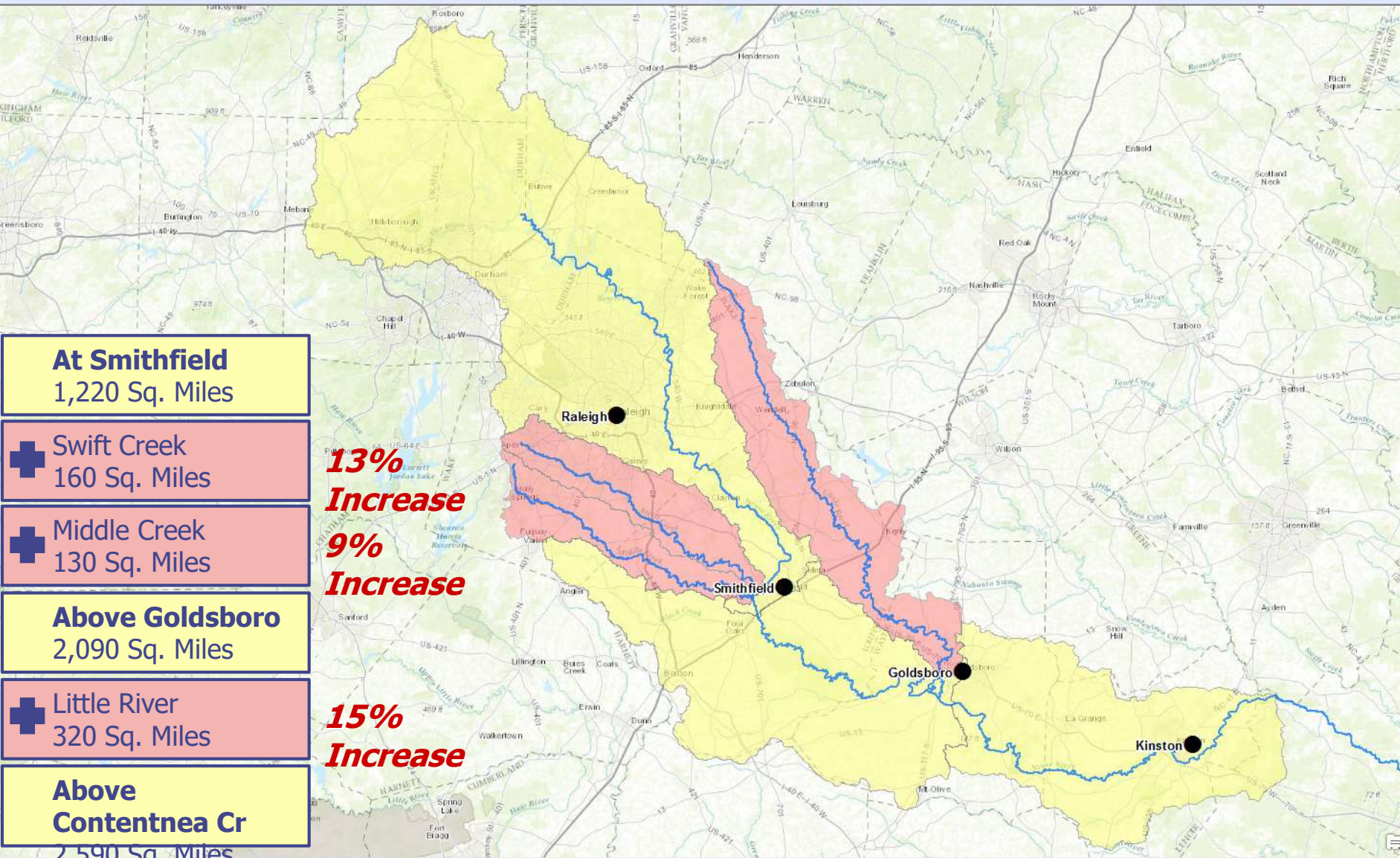


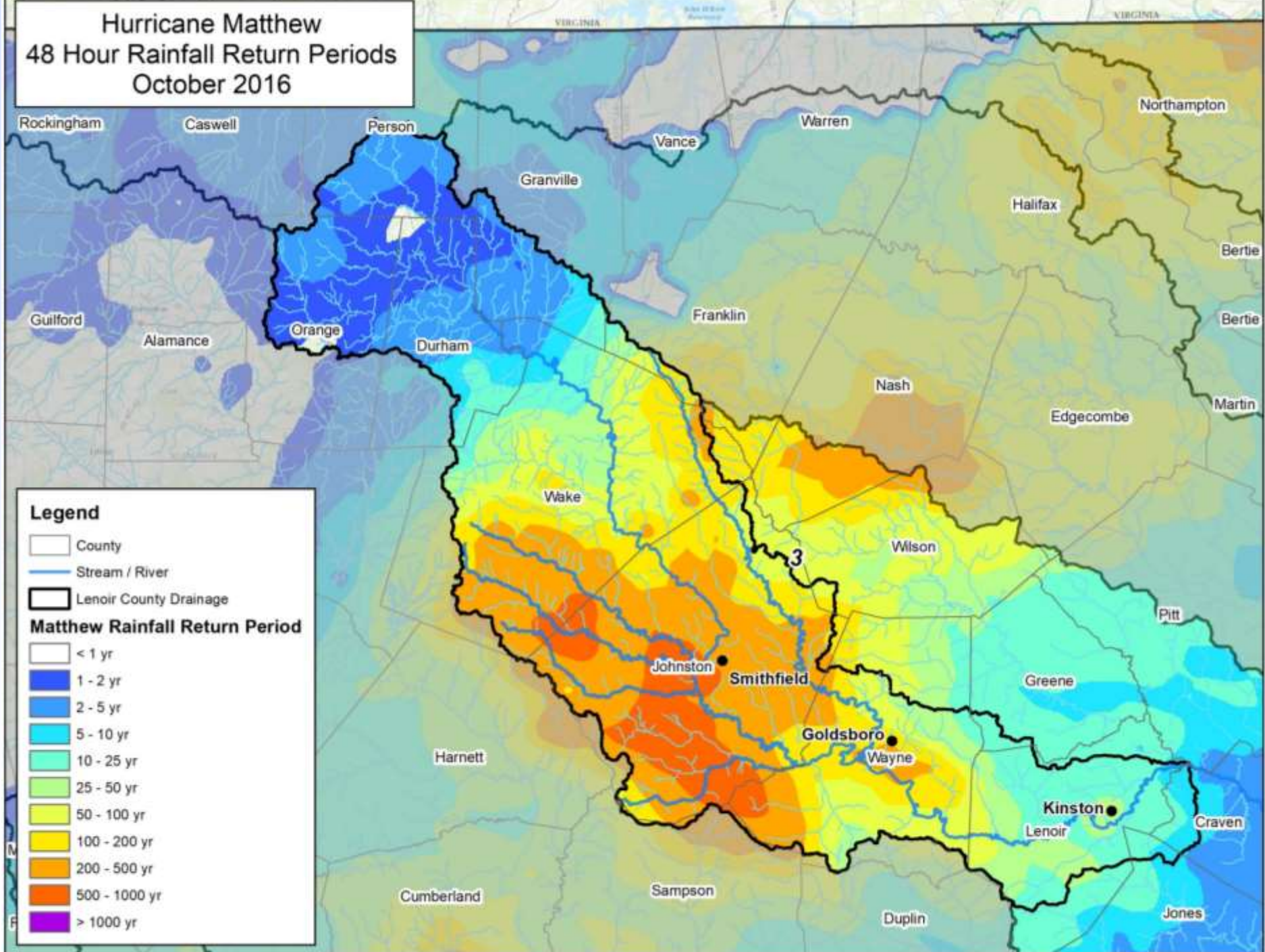
# Neuse River Basin Roundtable

August 24, 2017

# Major Contributors to Neuse Watershed



# Hurricane Matthew 48 Hour Rainfall Return Periods October 2016



## Legend

County

Stream / River

Lenoir County Drainage

## Matthew Rainfall Return Period

< 1 yr

1 - 2 yr

2 - 5 yr

5 - 10 yr

10 - 25 yr

25 - 50 yr

50 - 100 yr

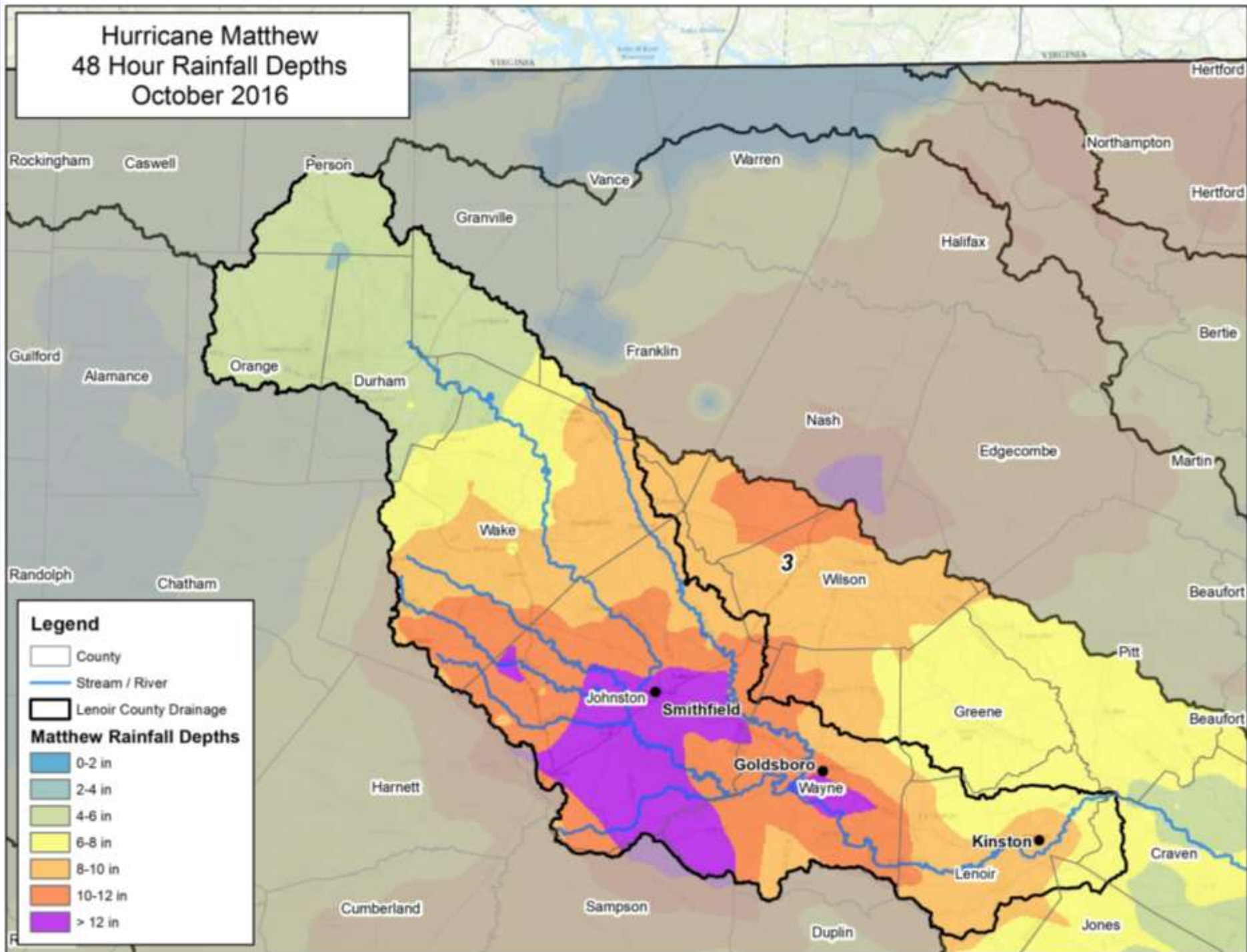
100 - 200 yr

200 - 500 yr

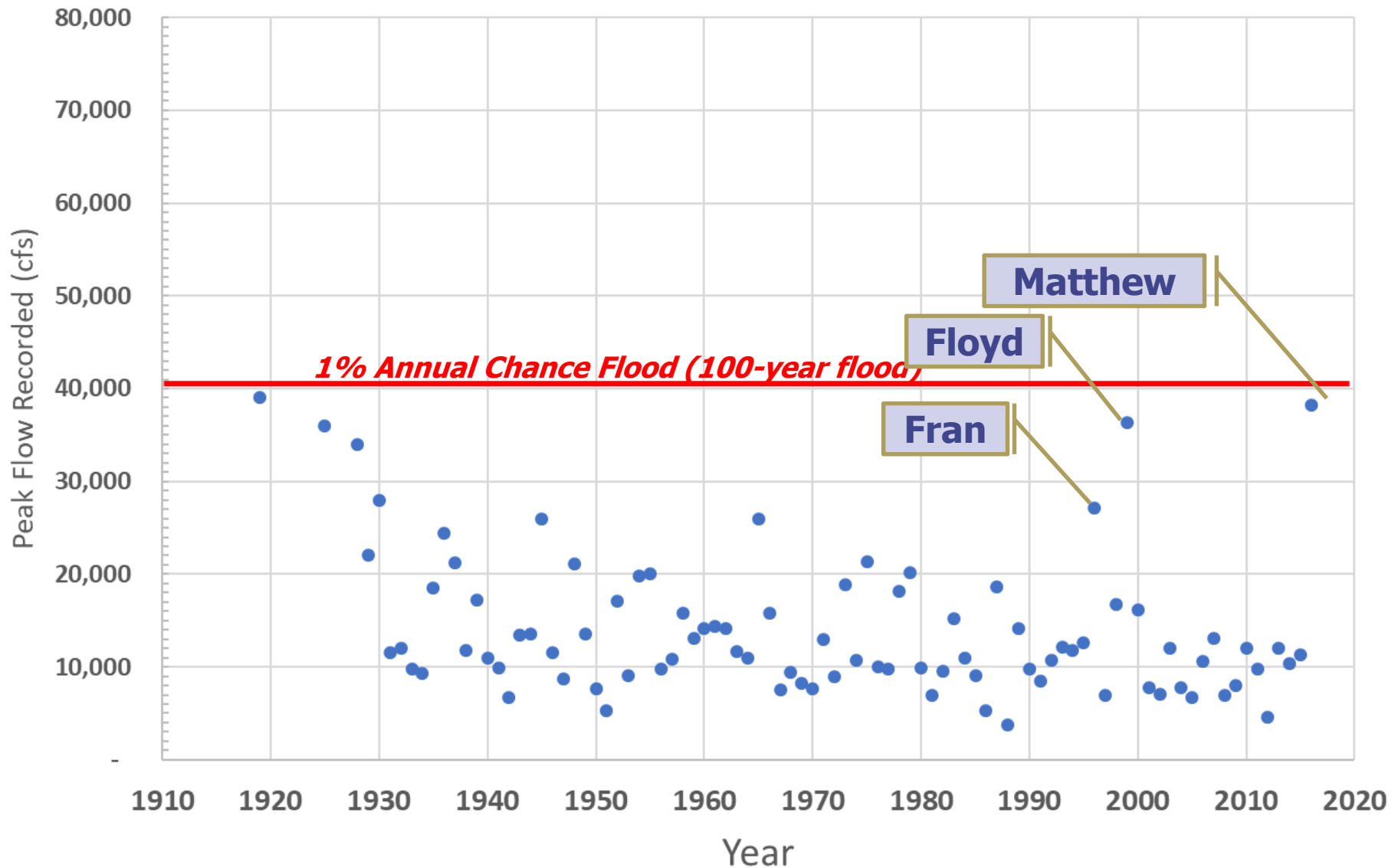
500 - 1000 yr

> 1000 yr

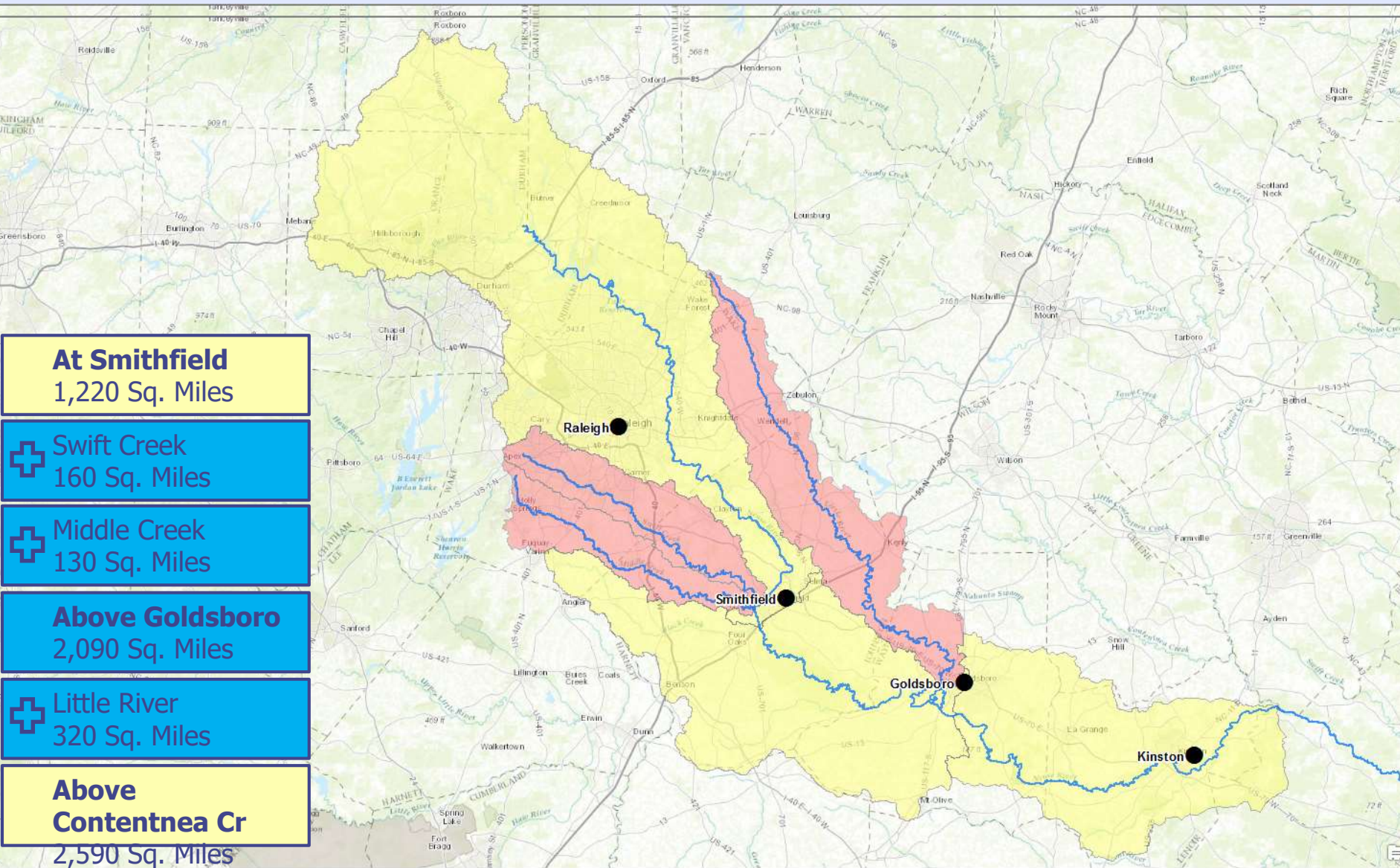
# Hurricane Matthew 48 Hour Rainfall Depths October 2016



# Neuse River: 97 Years of Flooding in Kinston



# Hurricane Matthew - Major Contributors to Neuse



**At Smithfield**  
1,220 Sq. Miles

**Swift Creek**  
160 Sq. Miles

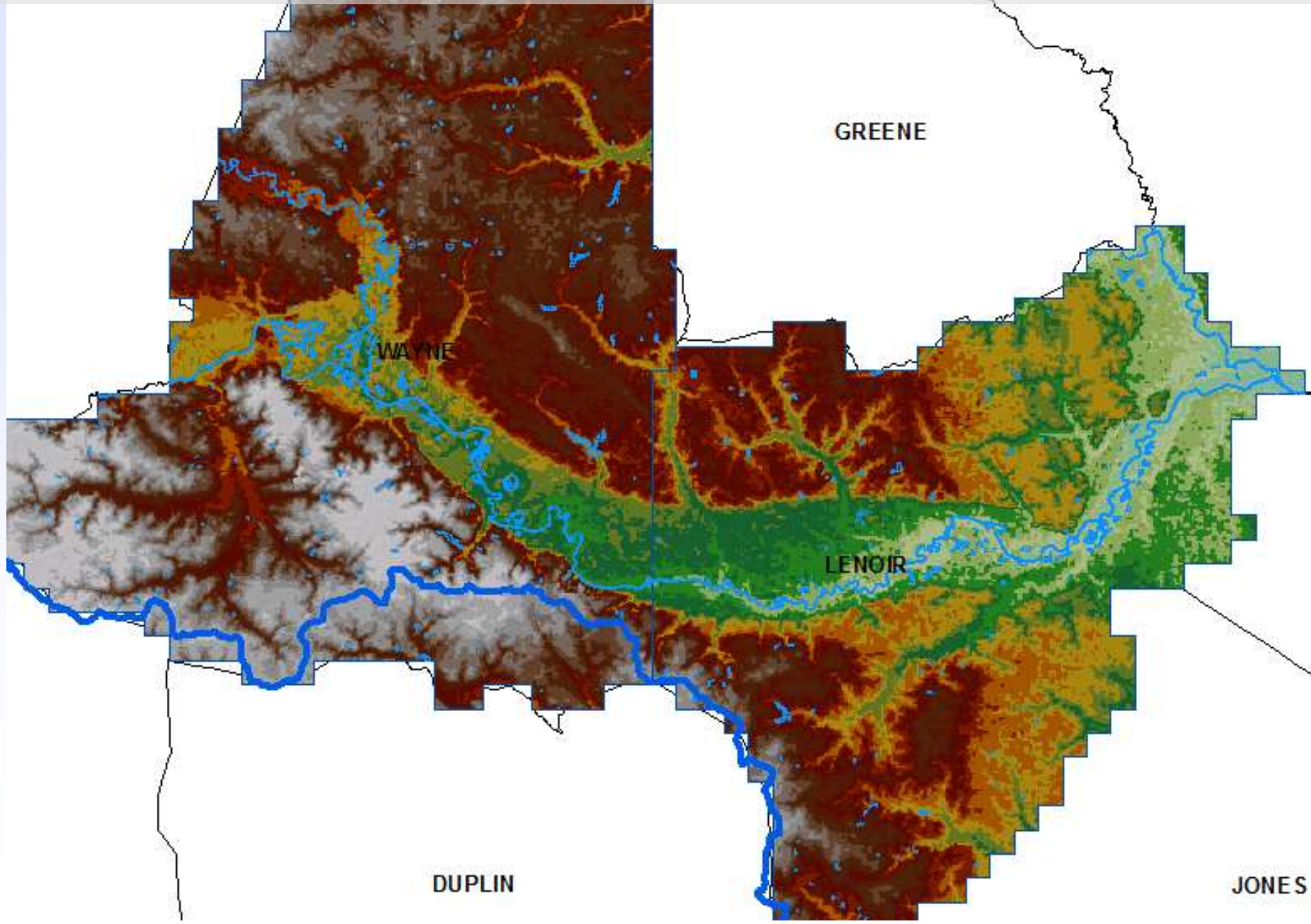
**Middle Creek**  
130 Sq. Miles

**Above Goldsboro**  
2,090 Sq. Miles

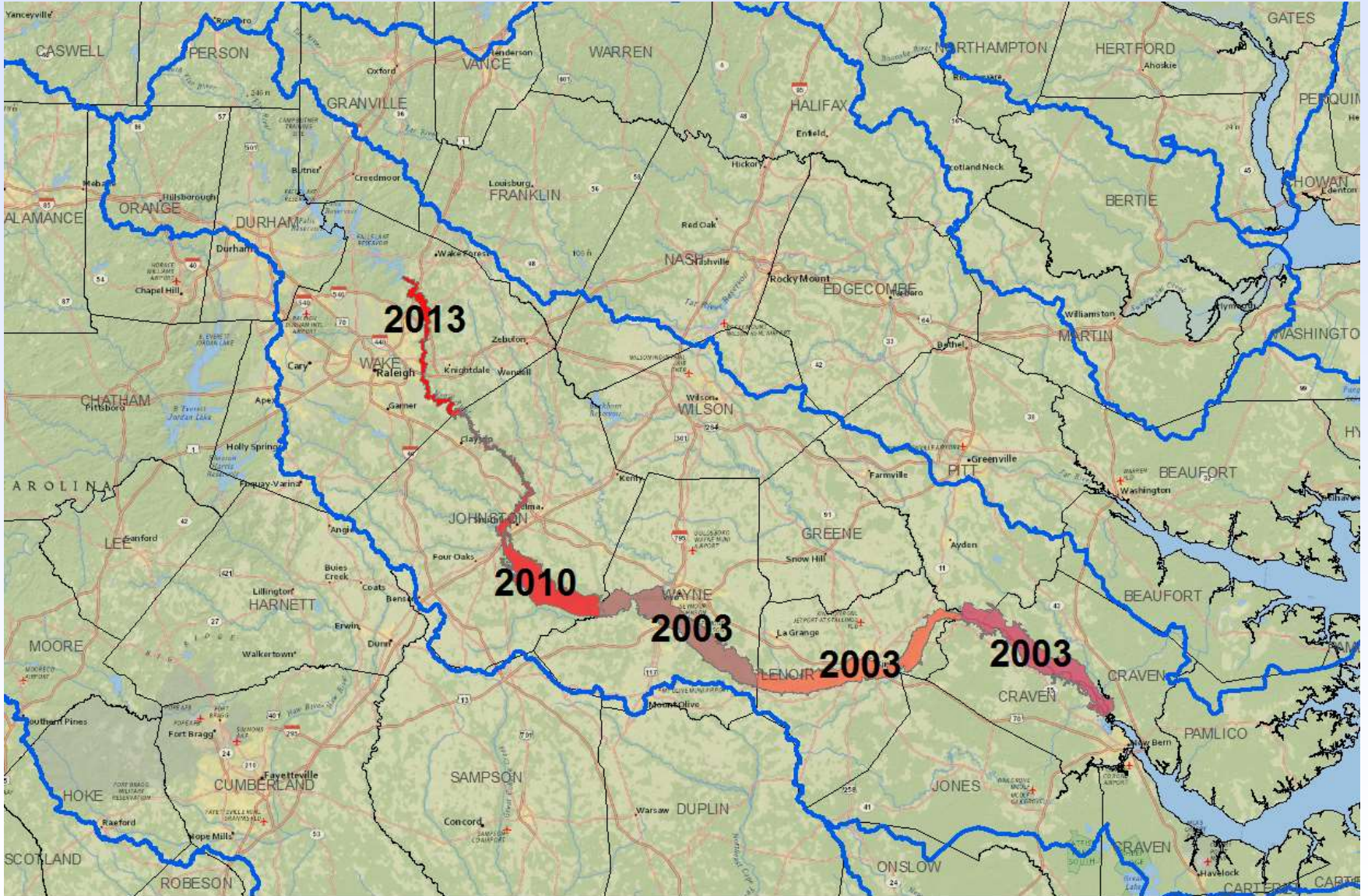
**Little River**  
320 Sq. Miles

**Above Contentnea Cr**  
2,590 Sq. Miles

# Neuse River Basins - Topography



# NCFMP Neuse River Flood Studies



# NCFMP Neuse River Flood Studies

- Hydraulics
  - HEC-RAS hydraulic models for the entire river in 5 segments downstream of Falls of Neuse (2003-2013)
  - 10, 25, 50, 100 and 500-year storm events and Hurricane Floyd in model runs
- Hydrology
  - Falls of Neuse Reservoir discharges provided by the US Army Corps of Engineers
  - Regression analysis and gage analyses used to determine downstream discharges in models

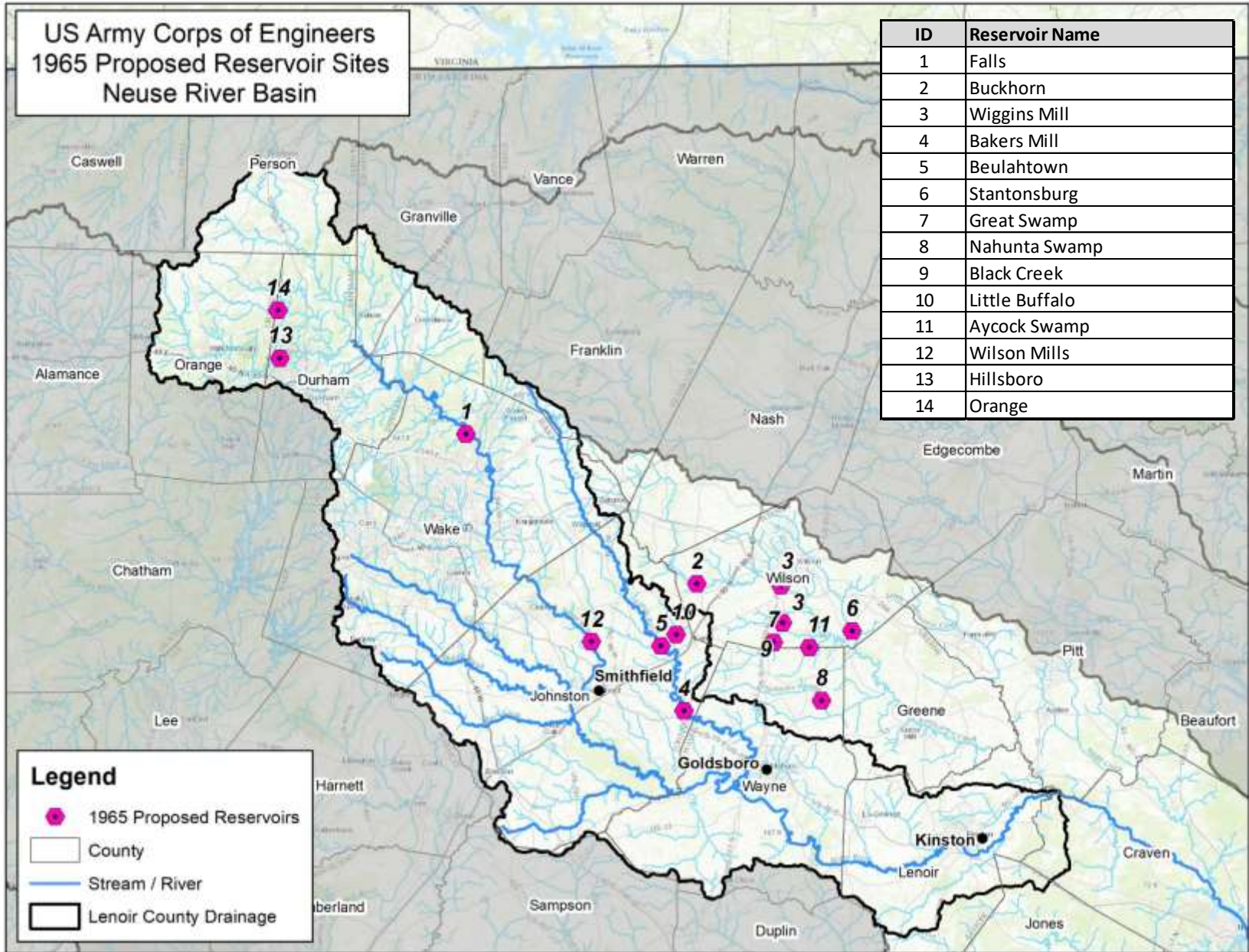
# NCFMP FIMAN Library Models

- Hydraulics
  - HEC-RAS hydraulic models for:
    - Neuse River at Clayton
    - Neuse River at Smithfield
    - Neuse River at Goldsboro
    - Neuse River at Kinston
  - Extend approximately 0.5-1.5 mile upstream and downstream of gage
  - Flood boundaries 0.5-ft increments – 10-yr to 500-year events

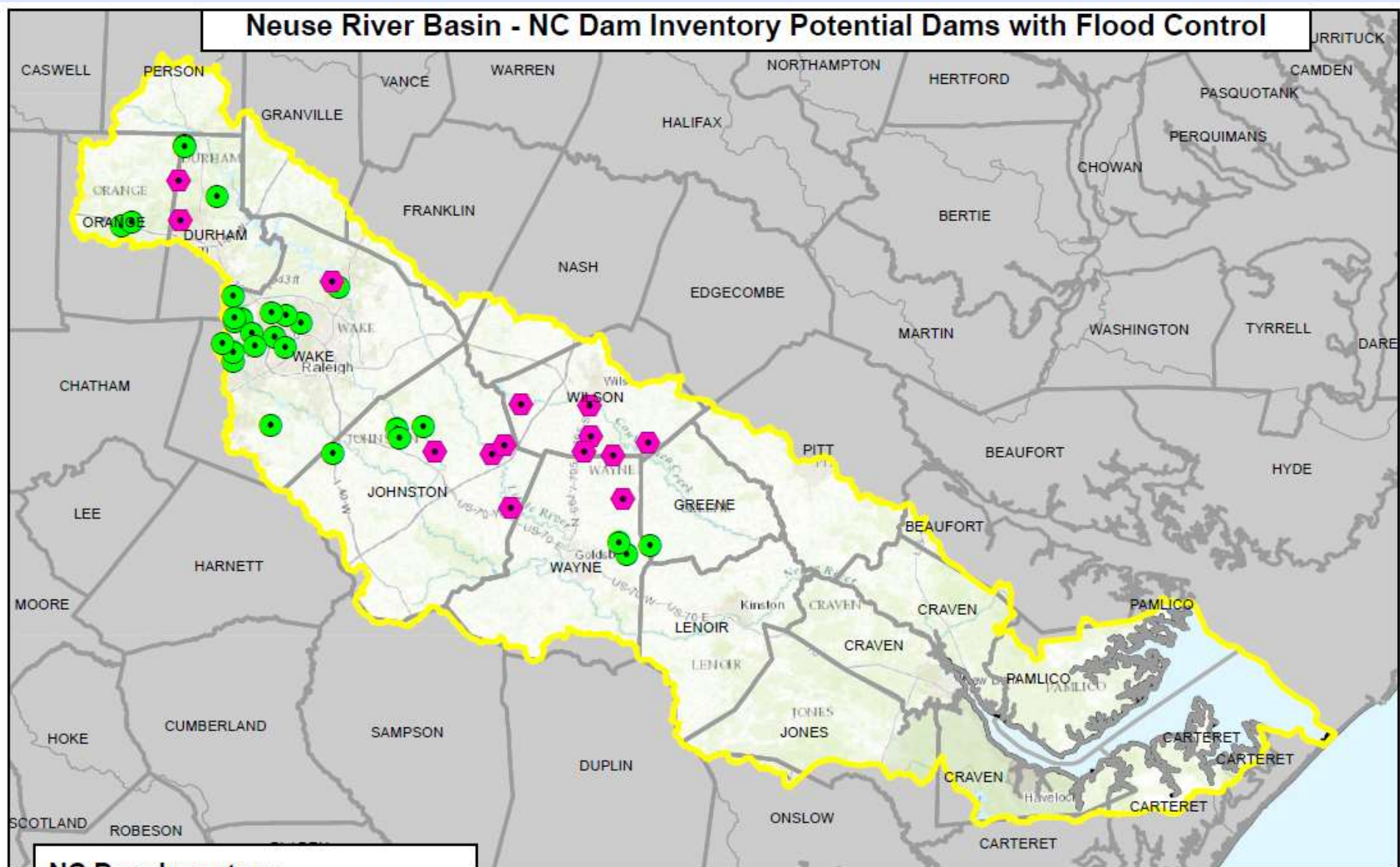
# Lenoir County and Kinston Summary of Neuse River Total Building Damages

| Frequency | Flow (cfs) | Neuse River Lenoir County Total Building Damages |              |               |                | Kinston Total Building Damages |              |               |                |
|-----------|------------|--|--------------|---------------|----------------|--------------------------------|--------------|---------------|----------------|
|           |            | Commercial                                       | Public       | Residential   | Total          | Commercial                     | Public       | Residential   | Total          |
| 10        | 22,600     | \$ 17,290,000                                    | \$ 1,310,000 | \$ 3,366,000  | \$ 21,966,000  | \$ 17,034,000                  | \$ 1,310,000 | \$ 2,629,000  | \$ 20,973,000  |
| 25        | 29,300     | \$ 33,409,000                                    | \$ 1,527,000 | \$ 7,098,000  | \$ 42,034,000  | \$ 32,698,000                  | \$ 1,527,000 | \$ 5,755,000  | \$ 39,980,000  |
| 50        | 34,700     | \$ 59,682,000                                    | \$ 1,675,000 | \$ 13,039,000 | \$ 74,396,000  | \$ 57,349,000                  | \$ 1,675,000 | \$ 9,308,000  | \$ 68,332,000  |
| 100       | 40,500     | \$ 89,545,000                                    | \$ 2,235,000 | \$ 21,532,000 | \$ 113,312,000 | \$ 84,916,000                  | \$ 2,235,000 | \$ 14,768,000 | \$ 101,919,000 |
| 500       | 55,600     | \$ 153,906,000                                   | \$ 4,509,000 | \$ 52,200,000 | \$ 210,615,000 | \$ 143,792,000                 | \$ 4,222,000 | \$ 30,715,000 | \$ 178,729,000 |





# 1965 Corps Recommended Reservoirs



# Neuse River Basin - NC Dam Inventory Potential Dams with Flood Control



## NC Dam Inventory

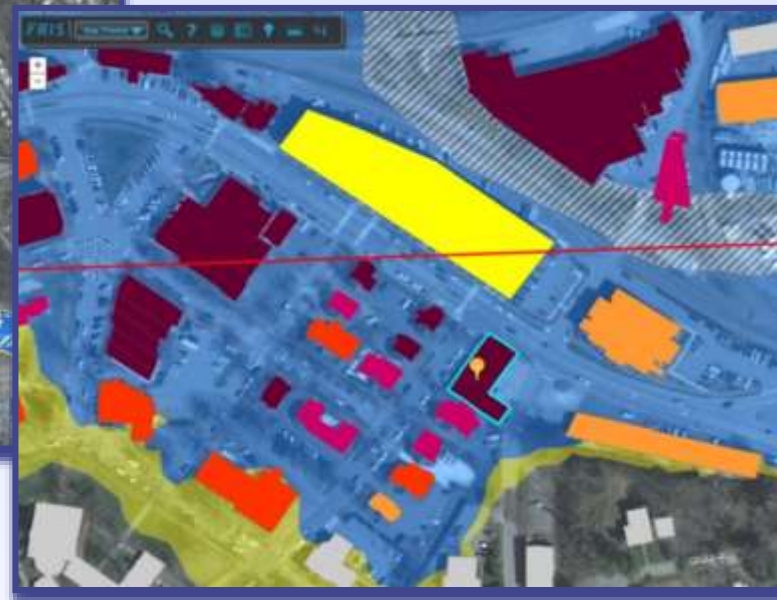
-  1965 USACE Proposed Reservoirs
-  Dam Inventory - Flood Control Structures
-  Neuse Watershed
-  County

## Neuse Dams with Flood Control 28 Existing Dams (162 Statewide)



# Potential Flood Mitigation Strategies

- Few strategies that would be utilized based on the level of protection required:
  - Creek Clean-out and Beaver Management;
  - Extended dry detention for flood control;
  - Diversion or By-Pass Channels;
  - Reservoirs / Detention Basins (Tulsa, Oklahoma);
  - Levees;
  - Agriculture and Timber Water Storage (slowing down the water);
  - and,
  - Infrastructure Support (Roads).
  
- NCEM – Risk Management prepared to support analysis.



# Questions?

[John.dorman@ncdps.gov](mailto:John.dorman@ncdps.gov)

# Neuse River Historical Studies

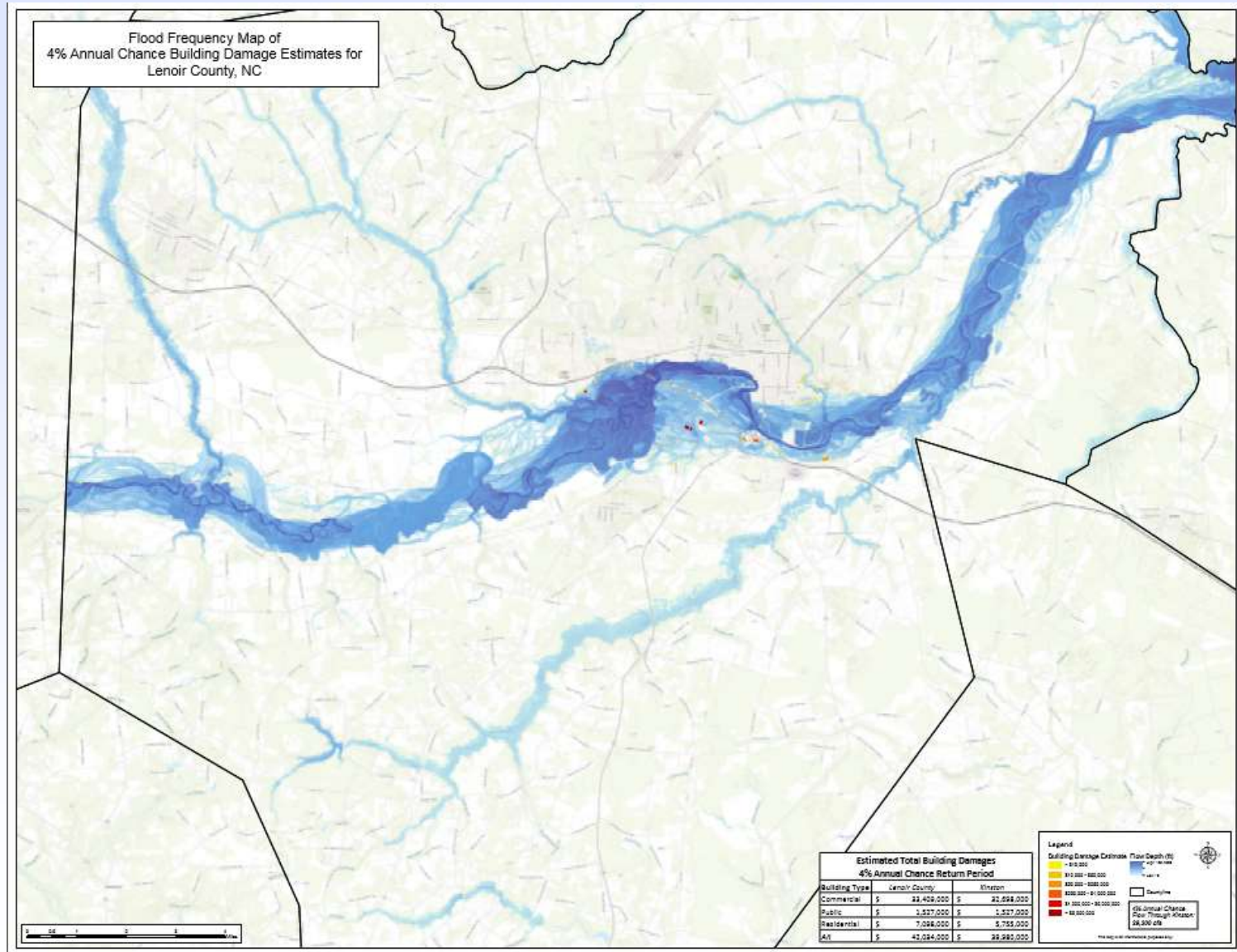
- US Army Corps of Engineers
  - **1963 Neuse River Basin, North Carolina, Survey Report**
  - Reconnaissance Report, Neuse River Basin, North Carolina. (May 1984)
  - Detailed Project Report and Environmental Assessment on Flood Damage Reduction, Adkin Branch, Kinston, NC. (December 1991)
  - Detailed Project Report and Environmental Assessment on Flood Damage
  - Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Demolition and Removal of the Pleasant Green Road Dam, on the Eno River, in Orange County, North Carolina. (October 2005)
  - The Reconnaissance Report, Neuse River Basin, North Carolina. (July 1999) – Basin-wide improvement to flood risk management

# Neuse River Historical Studies

- Other Studies
  - Neuse River Basin-wide Water Quality Plan (NCDWQ)
  - Neuse River Basin-wide Water Quality Plan and the Coastal Habitat Protection Plan (CHPP)
  - Environmental Assessment and Finding of No Significant Impact for the Demolition and Removal of the Rains Mill Dam, on the Little River, in Johnston County, North Carolina. (October 1999)
  - USEPA Albemarle-Pamlico National Estuary Program (APNEP)
  - Neuse River Basin Wide Water Quality Plan 2009. (State of NC)
  - The Kinston Waterfront–Now! (NC State University)
  - Neuse River Estuary Modeling and Monitoring Project (University of North Carolina)
  - Mapping of Neuse River Estuary (East Carolina University)
  - Neuse River Education Team. (East Carolina University)
  - The Nature Conservancy oyster restoration efforts in the Basin

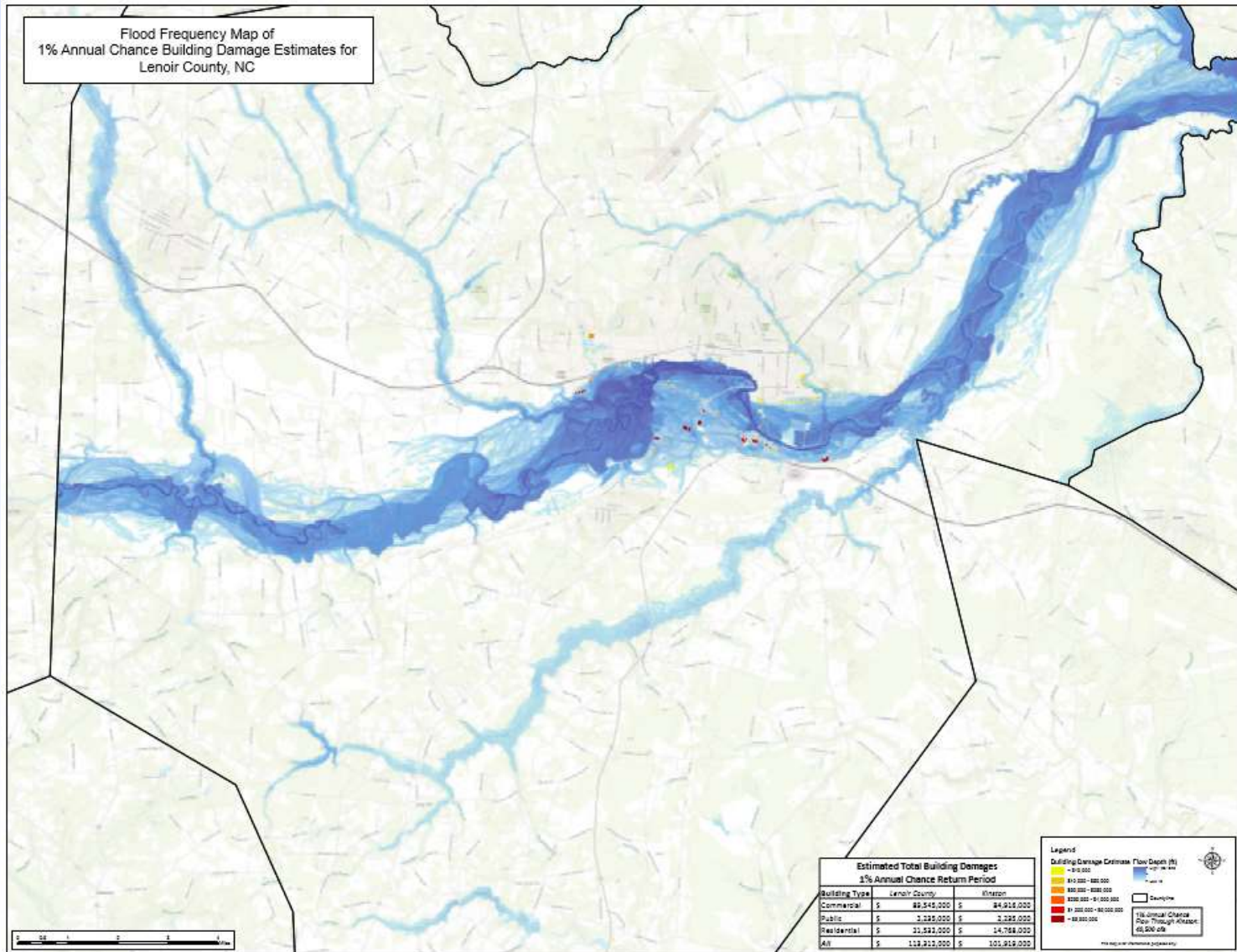


# Lenoir County Neuse River Total Building Damages – 4% Annual Chance Event

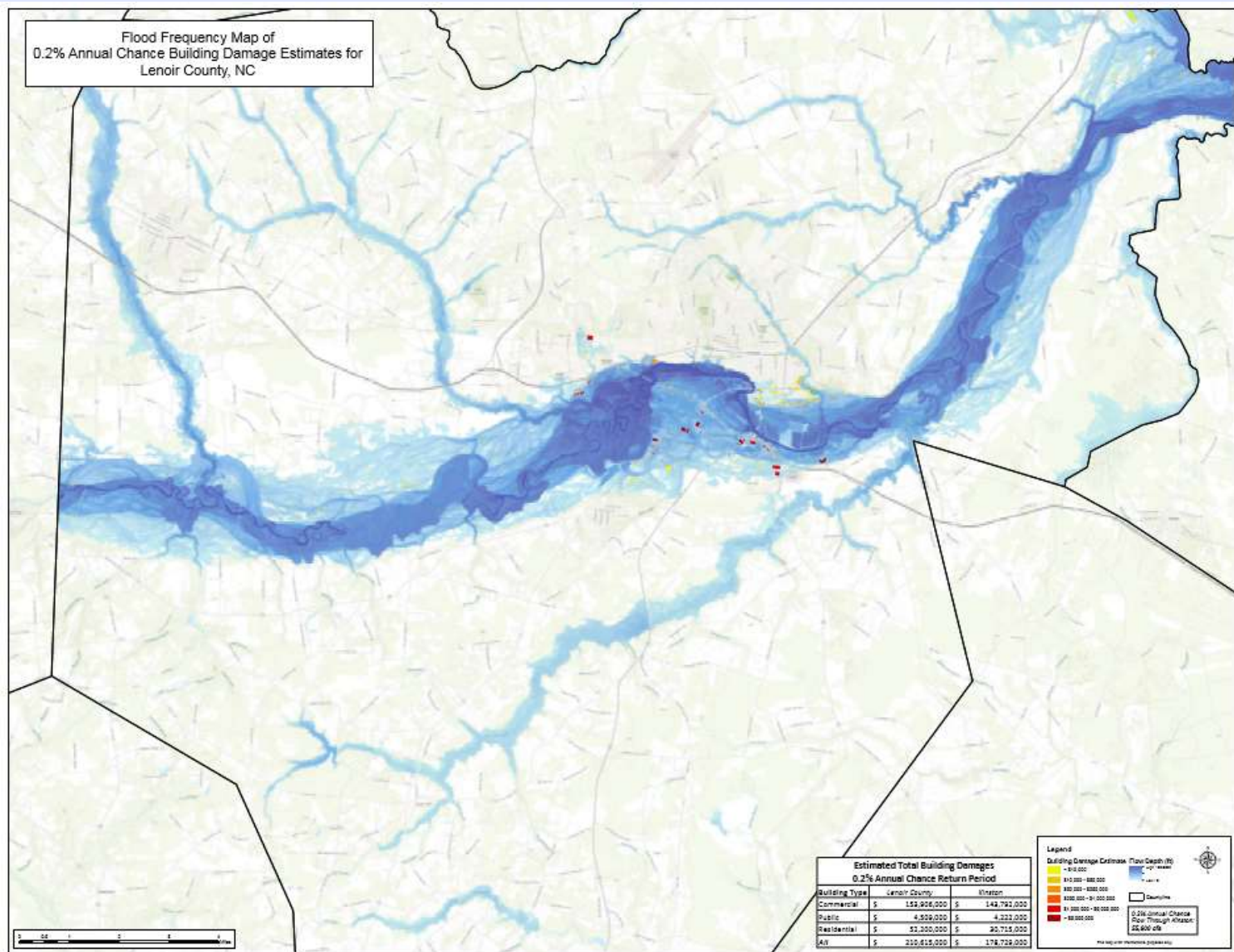




# Lenoir County Neuse River Total Building Damages – 1% Annual Chance Event



# Lenoir County Neuse River Total Building Damages – 0.2% Annual Chance Event



# NCFMP FIMAN Library Models

