

Stream Buffers and Stormwater Control Measures



REGIONAL
STORMWATER
PARTNERSHIP
OF THE CAROLINAS

Presented by:

Will Wilhelm, P.E., CFM, CPESC

Kimley»»Horn







LANCASTER HIGH 84° LOW 69°



6:01 72°



LIVE

WEATHER ALERT • WEATHER ALERT SECRET SHORT CUT RD

FOX46 5:35 74°

TRACKING FLOODING IN MONROE

BREAKING NEWS TRACKING FLORENCE



Flooded Homes

EAST CHARLOTTE



4:08 81°

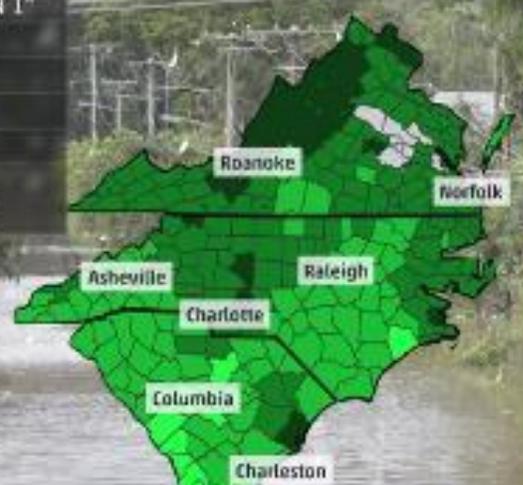
WEATHER ALERT

FLASH FLOOD RISK

VIRGINIA & CAROLINAS

AS OF 6 AM SATURDAY

- LESS THAN 1"
- 1 - 2"
- 2 - 3"
- 3 - 4"
- 4 - 5"
- 5" +
- NO DATA



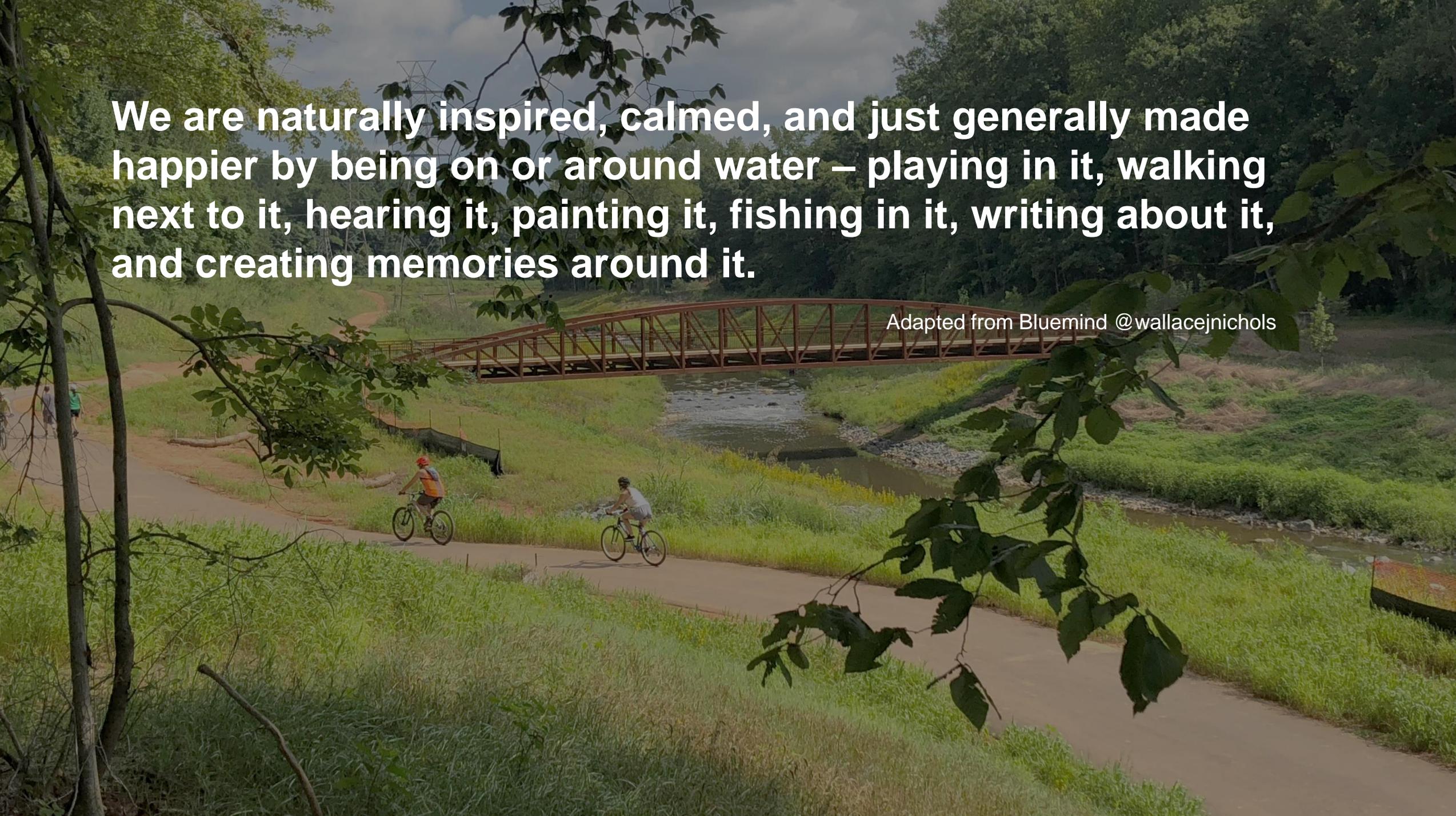
RAIN REQUIRED WITHIN 6 HOURS TO PRODUCE FLASH FLOODING

Norfolk, VA	1.1"
Roanoke, VA	2.6"
Charlotte, NC	2.7"
Asheville, NC	3.2"
Raleigh, NC	3.1"
Columbia, SC	3.4"
Charleston, SC	3.8"

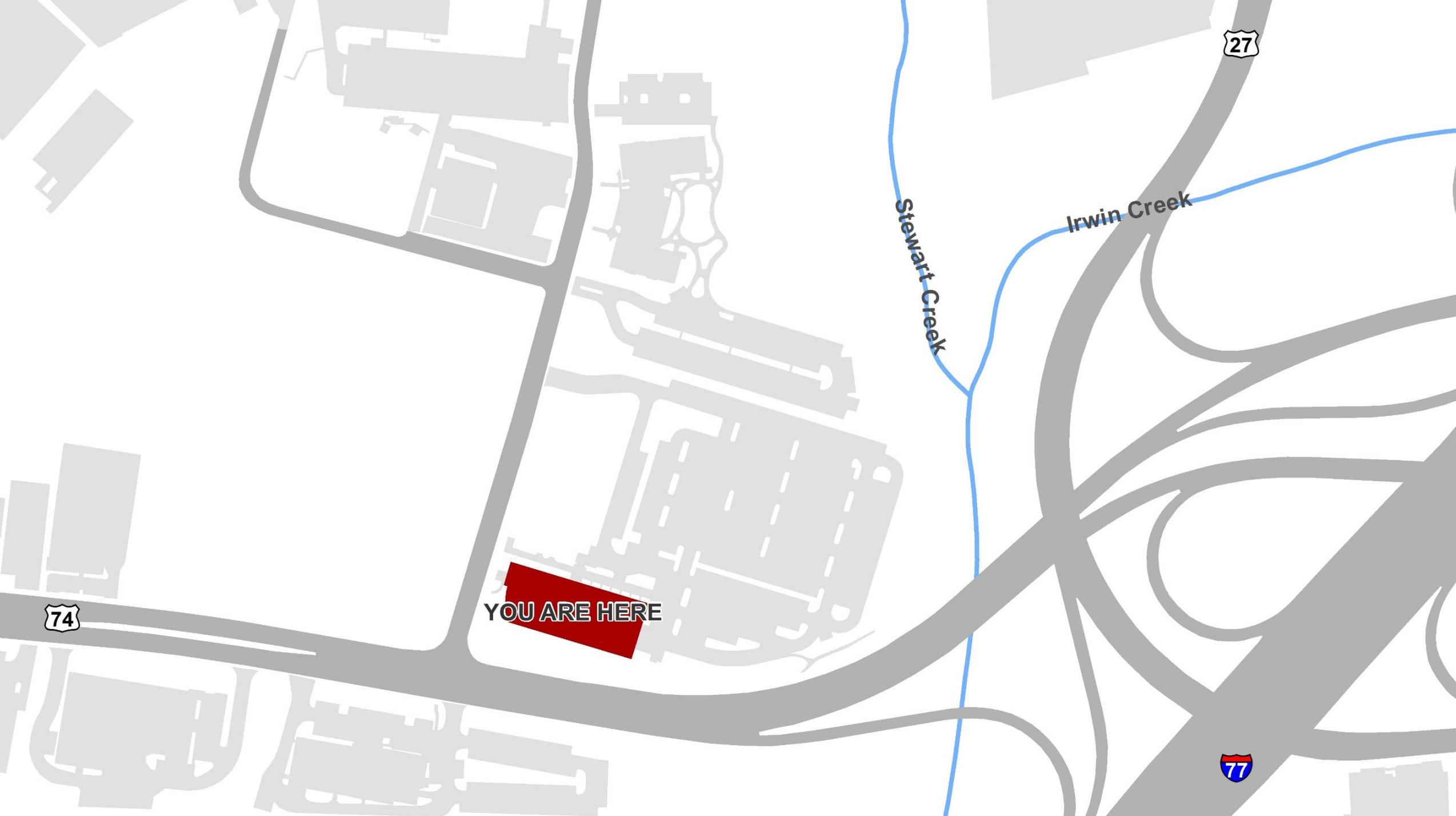


We are naturally inspired, calmed, and just generally made happier by being on or around water – playing in it, walking next to it, hearing it, painting it, fishing in it, writing about it, and creating memories around it.

Adapted from Bluemind @wallacejnichols







27

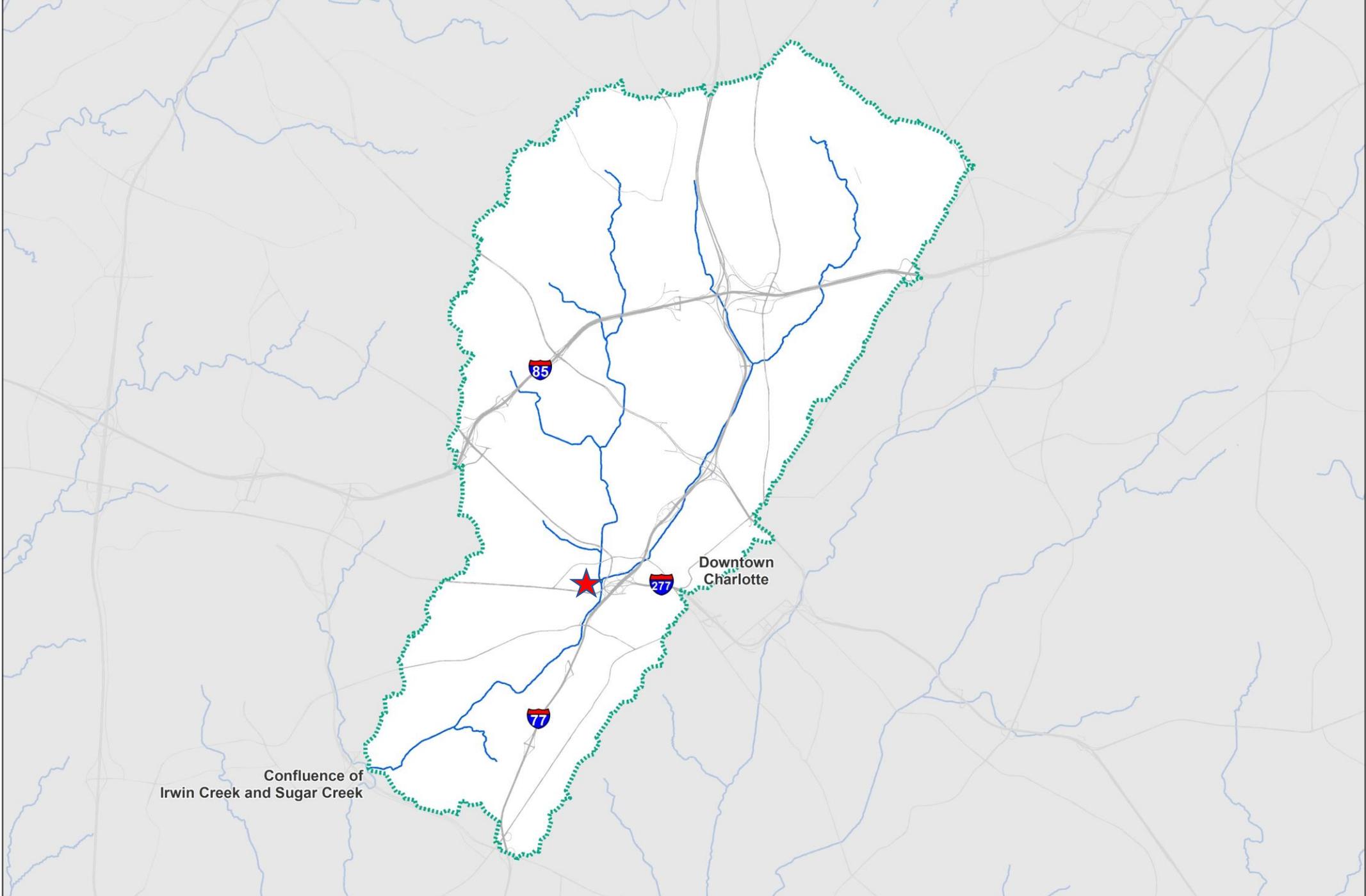
Stewart Creek

Irwin Creek

YOU ARE HERE

74

77



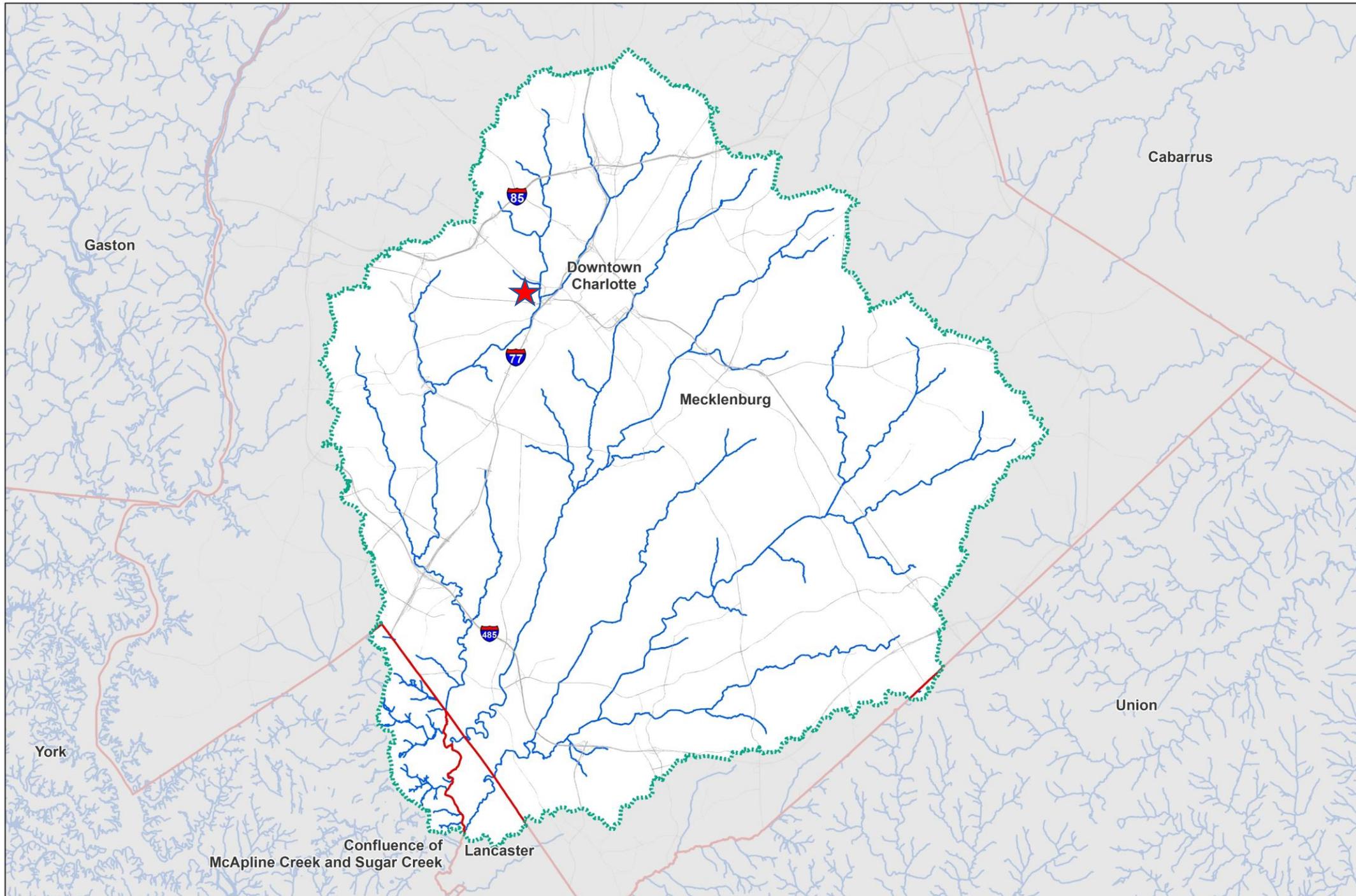
85

77

277

Downtown
Charlotte

Confluence of
Irwin Creek and Sugar Creek



Gaston

Cabarrus

Downtown
Charlotte

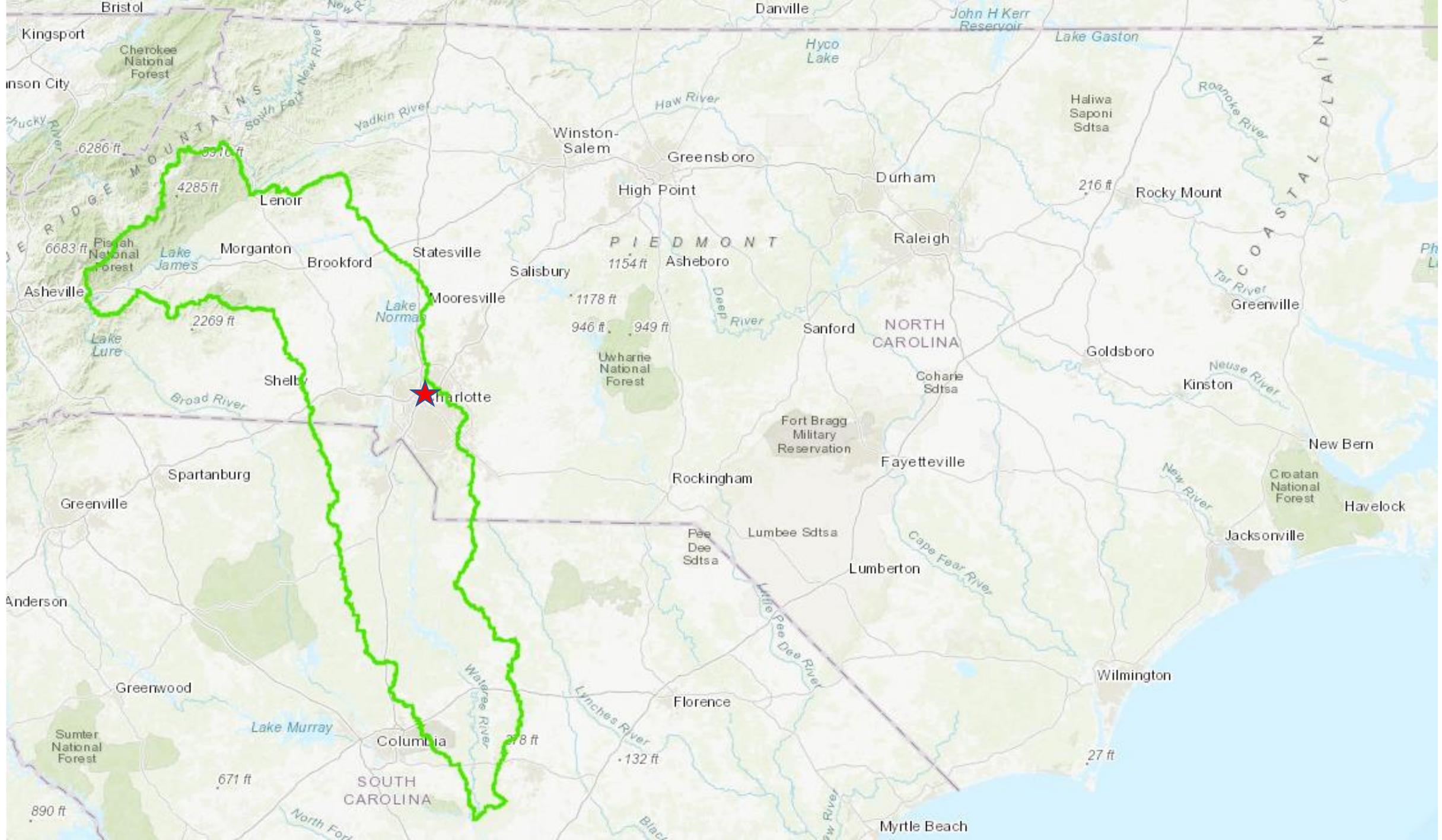
Mecklenburg

Union

York

Confluence of
McApine Creek and Sugar Creek

Lancaster

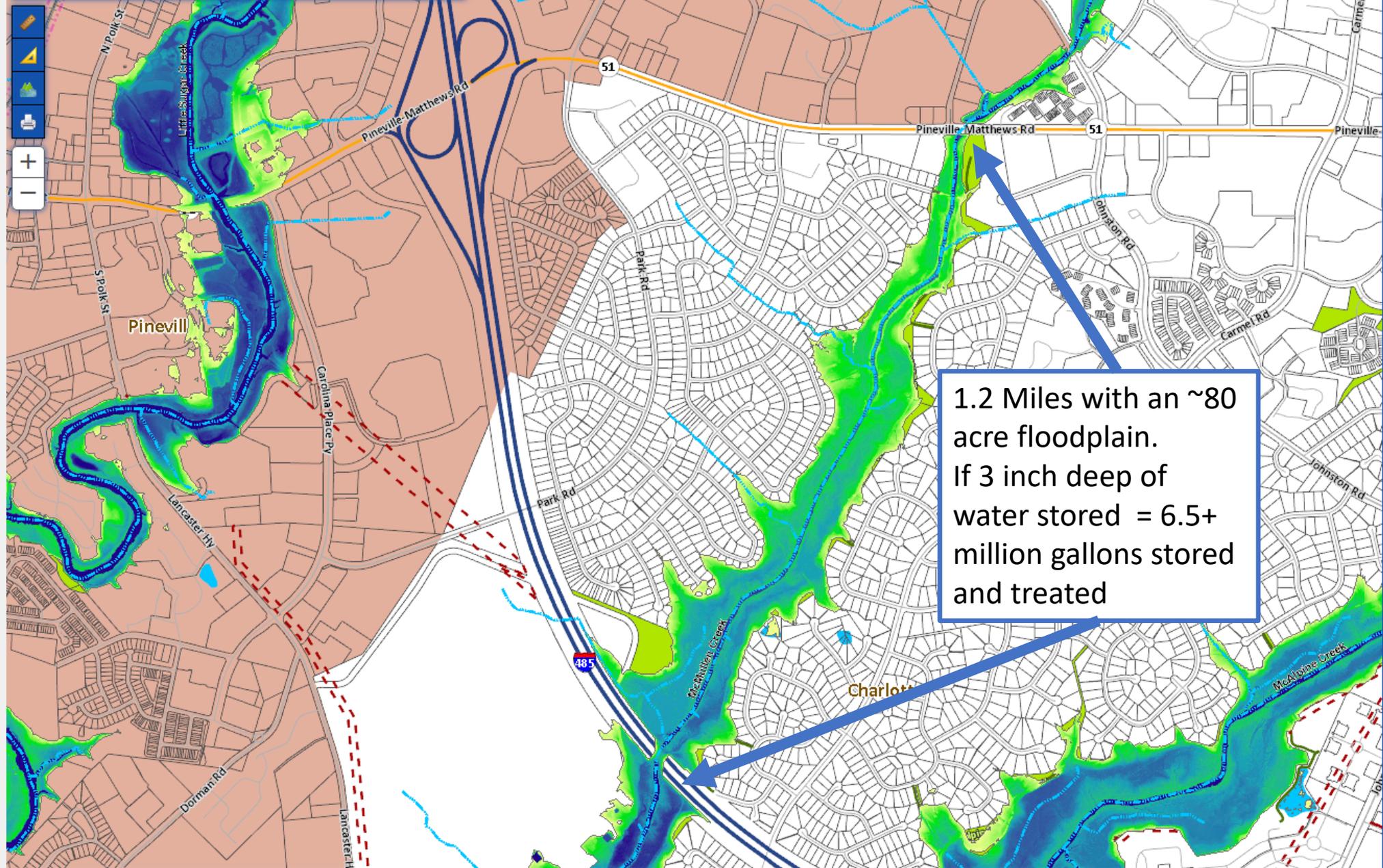


Modern Stormwater Management

- Modern Stormwater Management investments boost the economy, enhance community health and safety, and provide recreation, wildlife, and other benefits.
- Modern Stormwater Management should incorporate both engineered systems and natural systems to provide clean water, conserve ecosystem values and functions, and provide a wide array of benefits to people.
- Modern Stormwater Management protects, restores, or mimics the natural water cycle to the maximum extent practical. It should be effective, economical and enhance the overall community.
- Stormwater solutions can be applied on different scales, from the house or building level, to the broader landscape level. On the local level practices include rain gardens, permeable pavements, green roofs, infiltration planters, trees and tree boxes, and rainwater harvesting systems. At the largest scale, the preservation and restoration of natural landscapes (such as forests, floodplains, buffers and wetlands) are critical components.



Type Address/Parcel ID/Owner Name/Lndmark 🔍



1.2 Miles with an ~80
 acre floodplain.
 If 3 inch deep of
 water stored = 6.5+
 million gallons stored
 and treated

- ▲ Structure not in Floodplain by FEMA Letter
- ◆ Elevation Certificates
- FIRM Reference Points
- Cross Section Data
- Map Change Area

- FIRM Current
 - FEMA Floodplain
 - Community Floodplain
 - FEMA Floodways
 - Community Floodways
- Use FIRM Current for flood insurance and local regulatory purposes.

3D Floodzones

Shallow → Deep

Annual Chance Floodzone

Future - Future

0.2% - 500yr

1% - 100yr

2% - 50yr

4% - 25yr

10% - 10yr

20% - 5yr

50% - 2yr

Play Stop

Annual Chance of Flooding

■ 0.2% - 1%	■ 1% - 2%	■ 2% - 4%
■ 4% - 10%	■ 10% - 20%	■ 20% - 50%
■ Above 50%		

Enhanced datasets are non-regulatory and derived from latest available flood models, which may not be reflected on FIRM Current.



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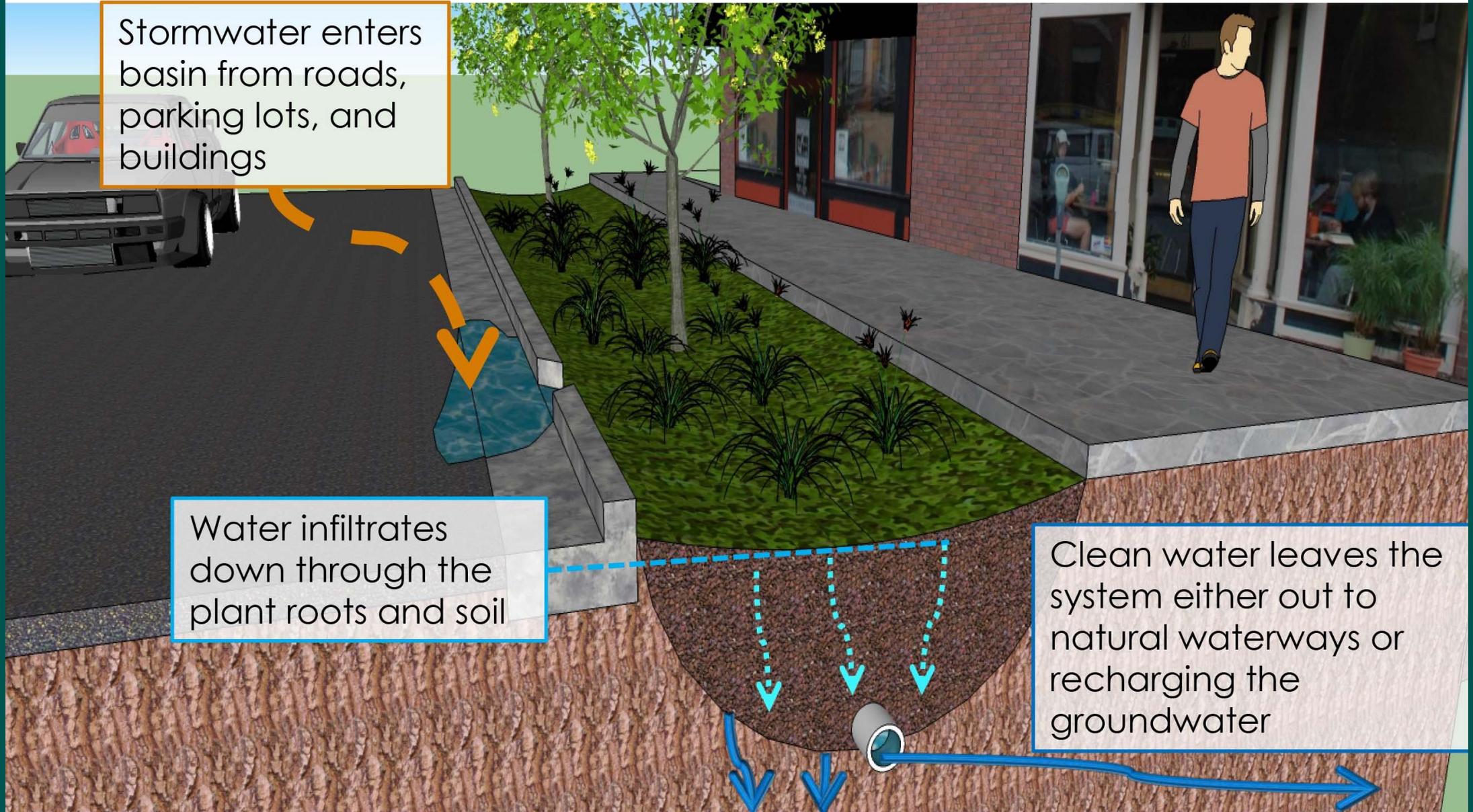








Bioretention basins capture pollutants from impervious surfaces.







Bioretention

Naturally Treating Polluted Runoff

STORMWATER is water that originates from rain events. Stormwater that does not soak into the ground becomes surface runoff and flows to nearby ditches, storm drains and waterways. Stormwater picks up pollution from the landscape, but does not go to a treatment plant.

BIORETENTION BASINS are engineered, landscaped depressions that receive stormwater runoff and improve water quality before runoff reaches ditches, storm drains and waterways, or groundwater. These pond alternatives have several benefits:

- **STORE AND ABSORB** WATER that might otherwise contribute to flooding
- **IMPROVE HABITAT** — Plants and soil trap insects and sediment
- **BEAUTIFY** the landscape — Plants use nutrients
- **NATURALLY REMOVE POLLUTANTS** — Engineered drainage removes nitrogen
- **NATURALLY REMOVE POLLUTANTS** — Soil microbes break down pathogens, like bacteria

How does bioretention work?

- 1** Rainwater and stormwater collect in the bioretention basin.
- 2** Plants absorb water and use nutrients for growth.
- 3** Water filters through specialized soil mix, removing pollutants and replenishing our groundwater supply.
- 4** Filtered, buried pipes ensure that water leaves before mosquitoes populate.
- 5** Natural treatment processes occur without costly pumps, fountains or pond maintenance.

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CLEMSON

 COOPERATIVE EXTENSION











Thank You



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