

Protecting Our Water Resources

An aerial photograph of a winding river with a distinct brown, turbid color. The river flows through a landscape of dense, mostly bare trees, suggesting a late autumn or winter setting. The river's path curves from the upper right towards the lower left of the frame.

- **Our Surface Water Resources**
- **What Do We Do To Protect Them**
- **Future Challenges & Opportunities**

McDowell Creek in Huntersville.

Partner Locations Within Watersheds



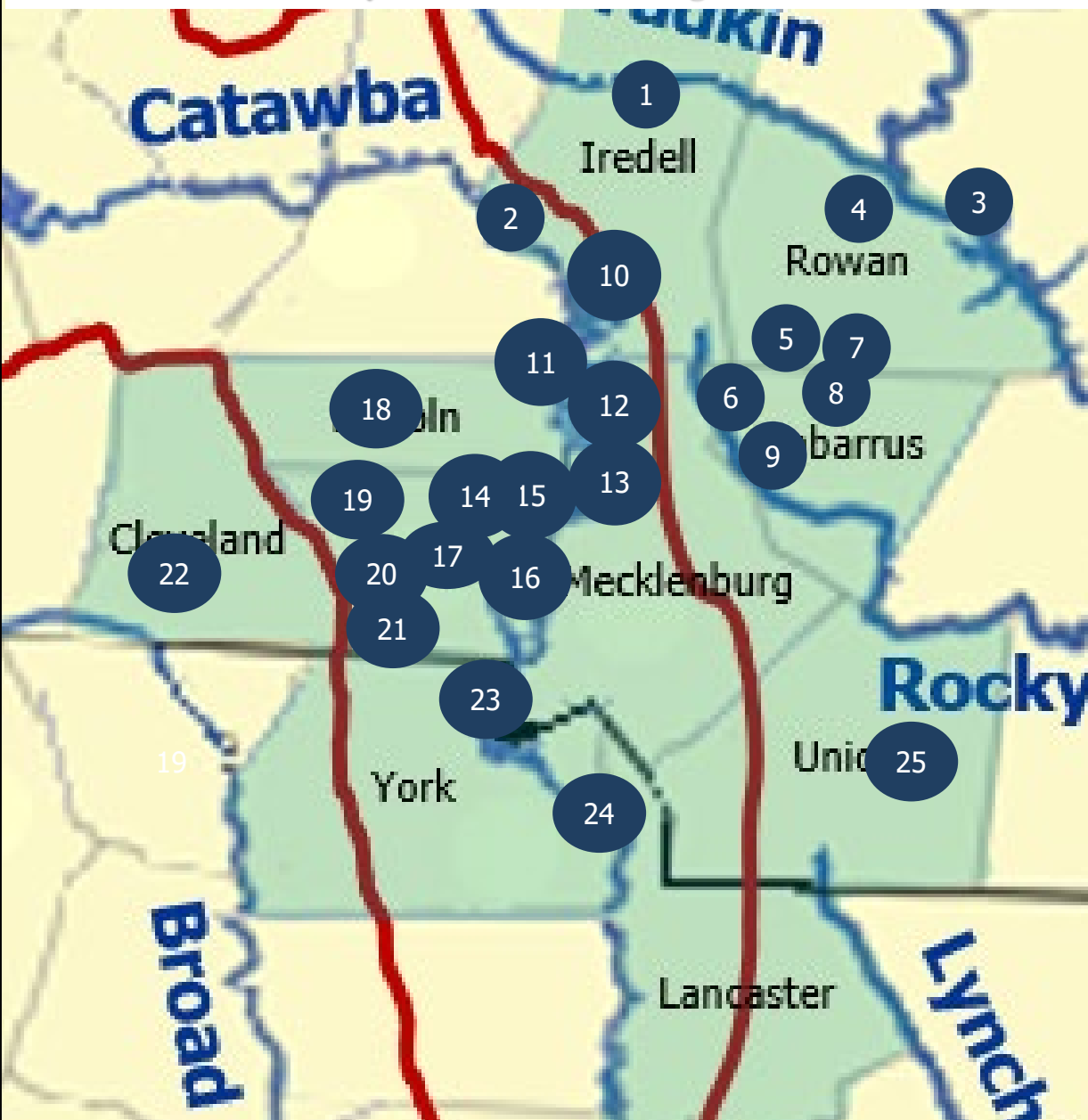
REGIONAL
STORMWATER
PARTNERSHIP
OF THE CAROLINAS



Partners

1. Belmont
2. Bessemer City
3. Charlotte
4. China Grove
5. Cornelius
6. Cramerton
7. Dallas
8. Davidson
9. Gaston County
10. Gastonia
11. Harrisburg
12. Huntersville
13. Kannapolis
14. Lake Park
15. Landis
16. Lowell
17. Matthews
18. Mecklenburg
19. Mint Hill
20. Monroe
21. Mooresville
22. Mount Holly
23. Pineville
24. Ranlo
25. Shelby
26. Stanley
27. Statesville

Surface Waters Are Our Most Important Natural Resource Because They Provide Our Drinking Water Sources



1. Statesville – South Fork of Yadkin
2. Statesville – Lookout Shoals
3. Salisbury, Rowan, Landis, China Grove – Yadkin River
4. Kannapolis – Second Creek/Back Creek
5. Kannapolis – Kannapolis Lake
6. Kannapolis – Coddle Creek
7. Concord – Lake Fisher/Coldwater Creek
8. Concord – Lake Concord/Coldwater Creek
9. Concord, Harrisburg – Lake Don T. Howell
10. Mooresville – Lake Norman
11. Lincoln County – Lake Norman
12. Davidson, Cornelius, Huntersville, Charlotte – Lake Norman
13. Charlotte, Pineville, Matthews, Mint Hill – Mountain Island Lake
14. Mount Holly, Stanley – Mountain Island Lake
15. Gastonia, Lowell, McAdenville, Cramerton, Ranlo – Mountain Island
16. Belmont – Lake Wylie
17. Dallas – South Fork of Catawba
18. Lincolnton – South Fork of Catawba
19. Cherryville – Indian Creek
20. Bessemer City – Long Creek
21. Bessemer City – Arrowwood Lake
22. Shelby – First Broad River
23. Rock Hill – Lake Wylie
24. Lancaster County, Union County, Lake Park – Catawba River, SC
25. Monroe – Lake Twitty

Total Annual Withdrawals = ±200 mgd



The amount of surface water withdrawn by our Partners everyday would fill Panthers Stadium 1.2 times.

Recreational Uses

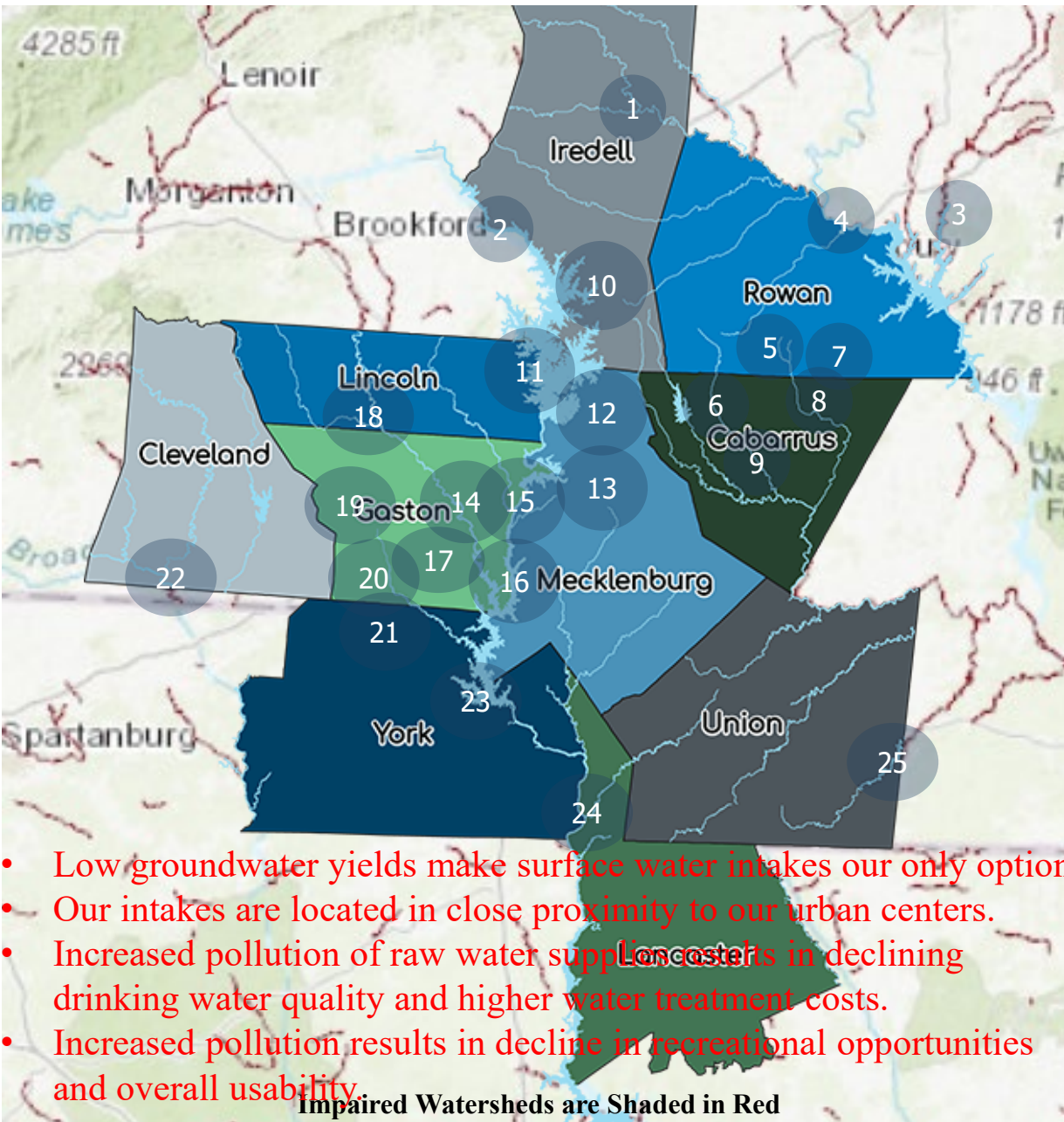


Over 10 million people visit the Catawba River annually. Visitation is projected to increase by about 11 percent per decade through 2050.



Greenways are becoming important recreational centers in our urbanizing areas. Mecklenburg County currently has 62 miles of greenways with visitation exceeding 250,000 annually. Greenway development is rapidly expanding.

Many of Our Surface Water Resources are Impaired/Polluted



1. Irwin, McAlpine, Little Sugar, and Sugar Creek Watersheds for Fecal Coliform Bacteria; Long, McAlpine, Sugar, Little Sugar, and Irwin Creek Watersheds for Turbidity; and McAlpine, Little Sugar, and Irwin Creeks for DO.
2. Goose Creek Watershed for Fecal Coliform
3. McDowell Creek Watershed for Fish Community.
4. Lake Wylie Watershed for Nutrients.
5. Crowders Creek Watershed for Fecal Coliform Bacteria.
6. Rocky River Watershed for Fecal Coliform Bacteria.
7. Yadkin River Watershed for Turbidity.
8. Clark Creek Watershed for Fecal Coliform Bacteria.
9. Browns Creek Watershed for DO.

Urbanization is the Primary Source of Impairment



Urbanization Equation:

**Increased Population = Urbanization =
Increased Impervious Area = Increased
Storm Water Pollution, Volumes & Velocities
= Impaired/Polluted Surface Waters +
Increased Flooding**

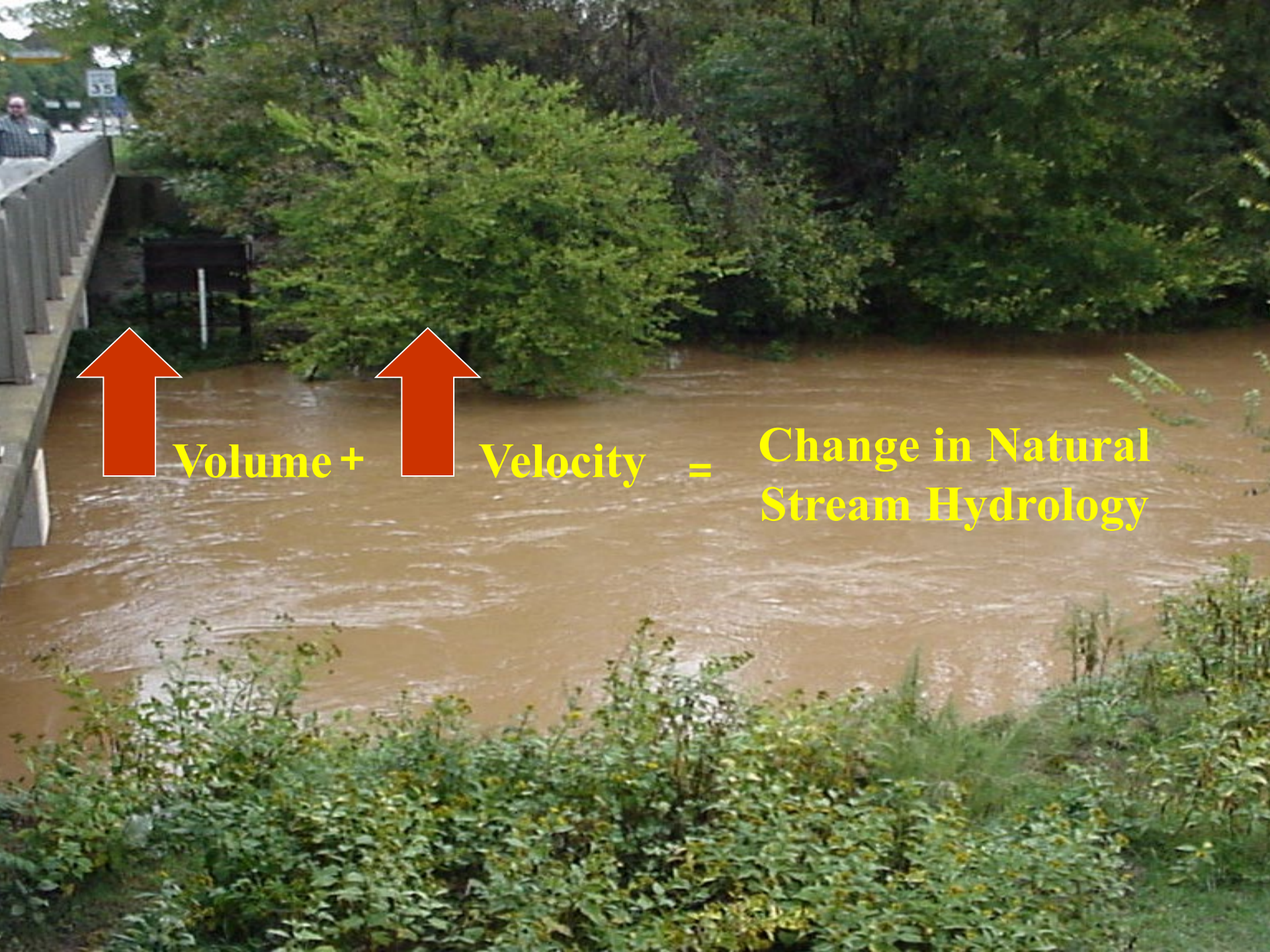
Typical Pollutants (Nonpoint) Include:

- **Bacteria (failing sewer systems)**
- **Metals (commercial, parking lots, roadways)**
- **Pesticides (lawn care)**
- **Nutrients (lawn care, wastewater)**
- **Hydrocarbons (commercial, parking lots, roadways)**
- **Sediment (poor erosion control)**

Increased stormwater volumes & velocities associated with increased impervious area is also a major source of degrade water quality



**One (1) inch of rainfall on one (1) acre of woods produces no runoff.
The same one (1) inch of rainfall on one (1) acre of asphalt will produce over
27,000 gallons of runoff.**



Volume +

Velocity =

**Change in Natural
Stream Hydrology**

channels.

14 feet

McDowell Creek in Huntersville



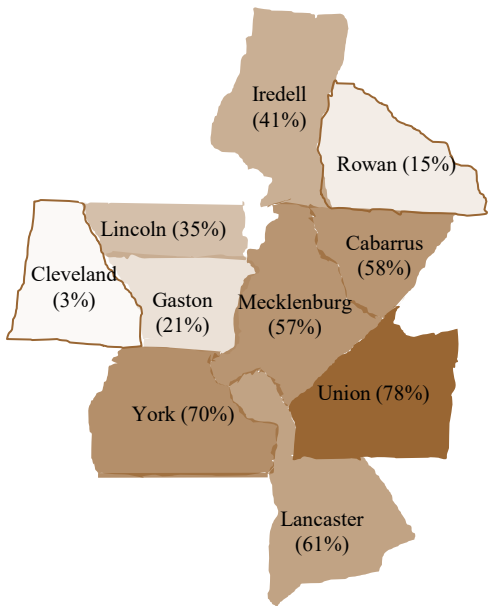
Sediment is deposited in the channel, the water becomes polluted, and aquatic life is destroyed.



Mayfly

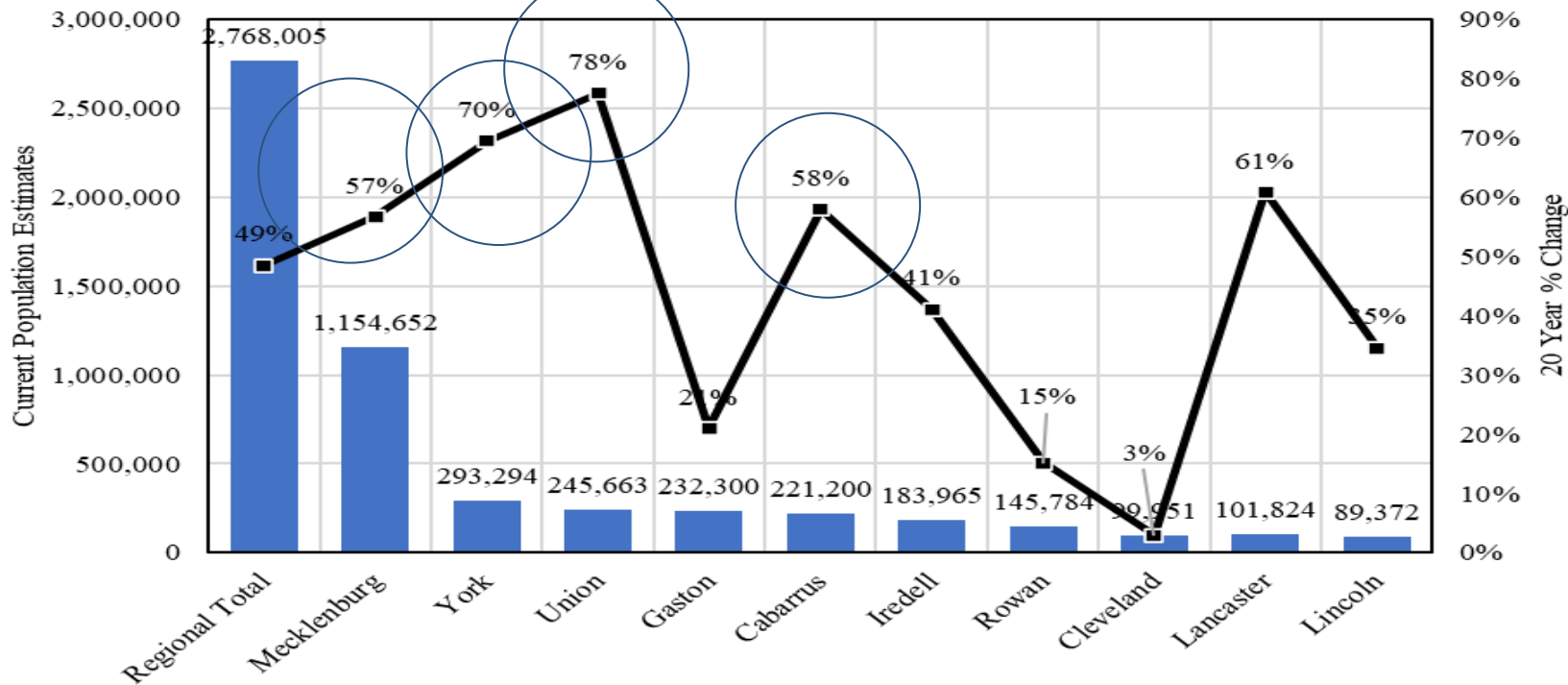
The Growing Water Challenge Created By Increased Urbanization

More People = More Pollution & Greater Demand

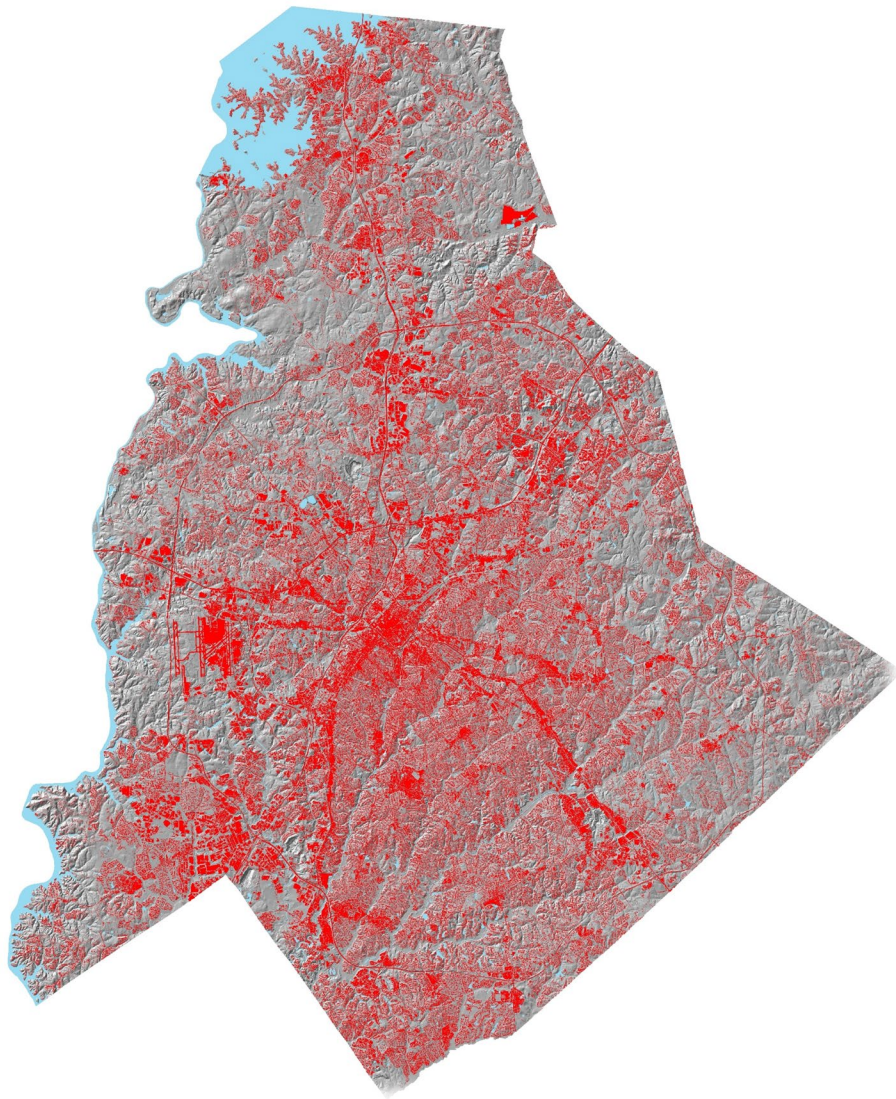


Our region is experiencing rapid population growth requiring ever increasing supplies of clean, reliable water, but this increased population is the greatest threat to our being able to fulfill our growing water needs. To address this challenge, our efforts to protect our water resources must grow with our population.

Regional Population Data



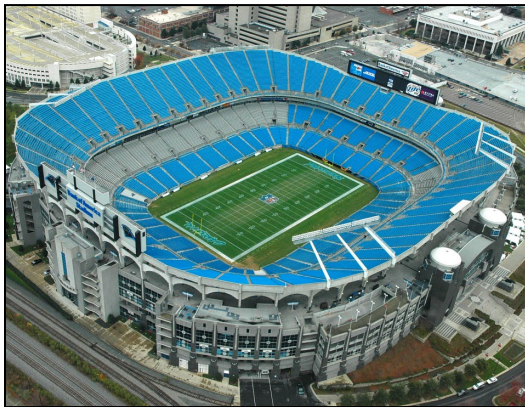
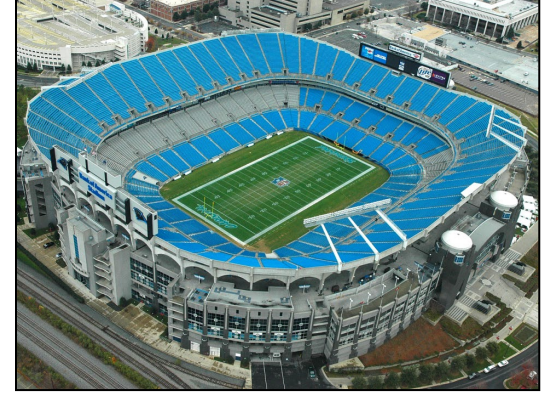
Population Growth Compared to Impervious Cover



Mecklenburg County has over 119 square miles of impervious area (22.61% of the surface area of the County) with a population of 1,154,652. This is an area larger than the City of Charleston, S.C.



In Mecklenburg County, impervious area is increasing by 1.78% annually or 3.6 acres/day, which is the equivalent of 3 football fields. Current annual population growth rate is 2%.



1 inch of rain will generate 2 billion gallons of runoff from the impervious areas in Mecklenburg County, which is enough water to fill Panthers Stadium 8 times. Our average annual rainfall is 44 inches that generates 88 billion gallons of runoff which would fill Panthers Stadium 340 times.

Water Supply Watershed & Post-Construction Ordinances Require Measures to Mitigate for the Impacts of Storm Water Runoff



Challenges & Opportunities

Challenge: Typical SCMs only remove $\pm 85\%$ total suspended solids (state minimum).

Opportunity: Require SCMs with nutrient removal capabilities to better protect our lakes.

Challenge: Most jurisdictions only require SCMs at $>24\%$ impervious area (state minimum).

Opportunity: Require SCMs at $>10\%$ impervious area which is when most negative water quality impacts begin to occur.

Challenge: SCMs need ongoing maintenance and have a limited life span.

Opportunity: Develop an effective inspection and maintenance program and have monies available for repairs.

Challenge: Buffers are usually 30 to 50 feet in width (state minimum).

Opportunity: Require 100-foot buffers to better filter pollutants and increase open space.

Challenge: SCMs are not allowed for redevelopment (Session Law 2018-145 (aka Senate Bill 469)).

Opportunity: Join with the RiverKeeper to get the law changed to control stormwater from existing impervious area when redeveloped which is the primary source of water quality impairment in urban areas.

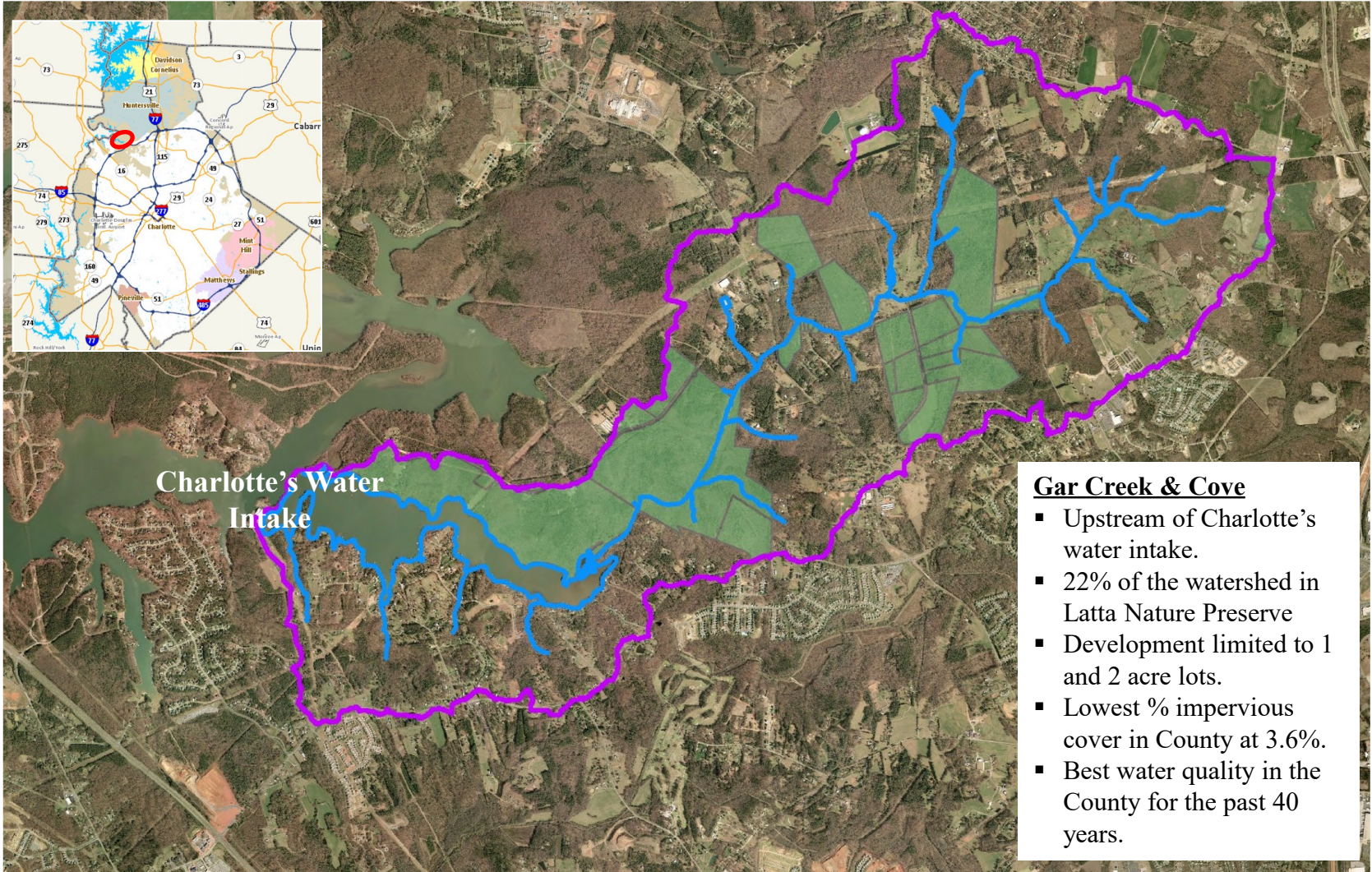
Much cheaper and easier to address water quality with new development and redevelopment than to retrofit fixes later.



Northcross Retrofit in Huntersville

Challenges & Opportunities

Land Conservation limits urbanization and is the best means of preventing water pollution

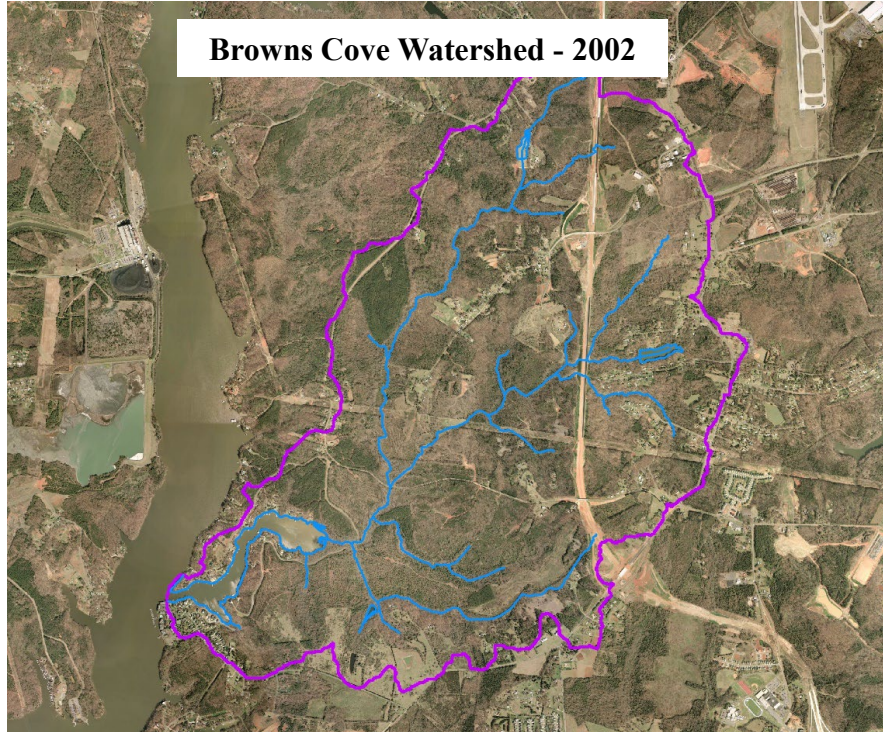


Gar Creek & Cove

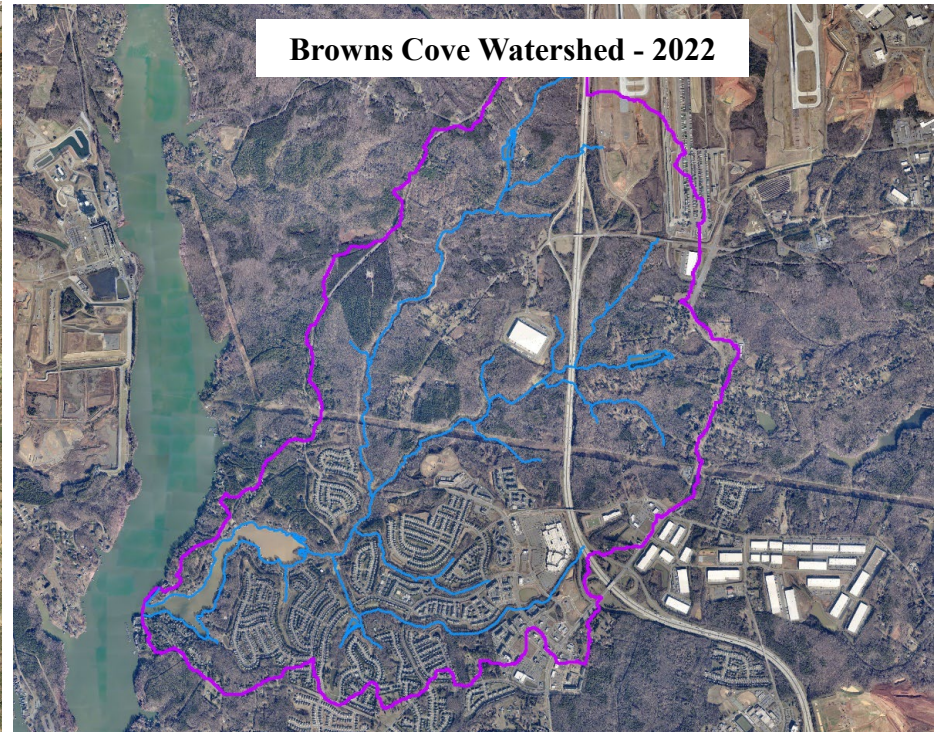
- Upstream of Charlotte's water intake.
- 22% of the watershed in Latta Nature Preserve
- Development limited to 1 and 2 acre lots.
- Lowest % impervious cover in County at 3.6%.
- Best water quality in the County for the past 40 years.

Challenges & Opportunities

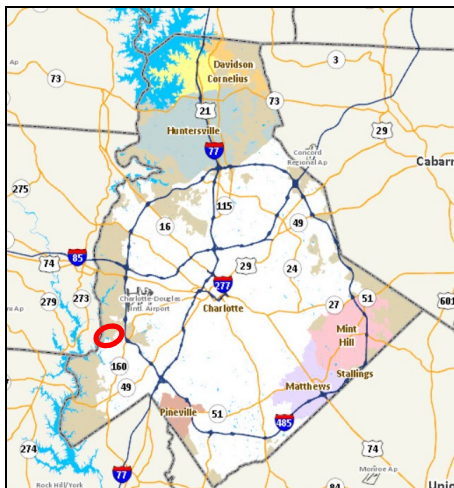
Coves are highly sensitive to impairment and warrant special protective measures.



Browns Cove Watershed - 2002



Browns Cove Watershed - 2022



Declining Water Quality in Catawba Coves

Declines in water quality have been observed in coves where significant increases in impervious area are occurring even with the installation of engineered stormwater control measures. An example is the Browns Cove Watershed that over the past 20 years has experienced:

- 118% increase in population
- 121% increase in impervious cover
- Increased sedimentation
- Declining water quality
- In 2016, +23,000 cubic yards was dredged from the cove at a cost of \$431,354.24

**Clean, usable surface waters are essential for sustaining our growing communities.
Immediate actions are needed to address impacts from increasing urbanization.**



Lake James at the headwaters of the Catawba