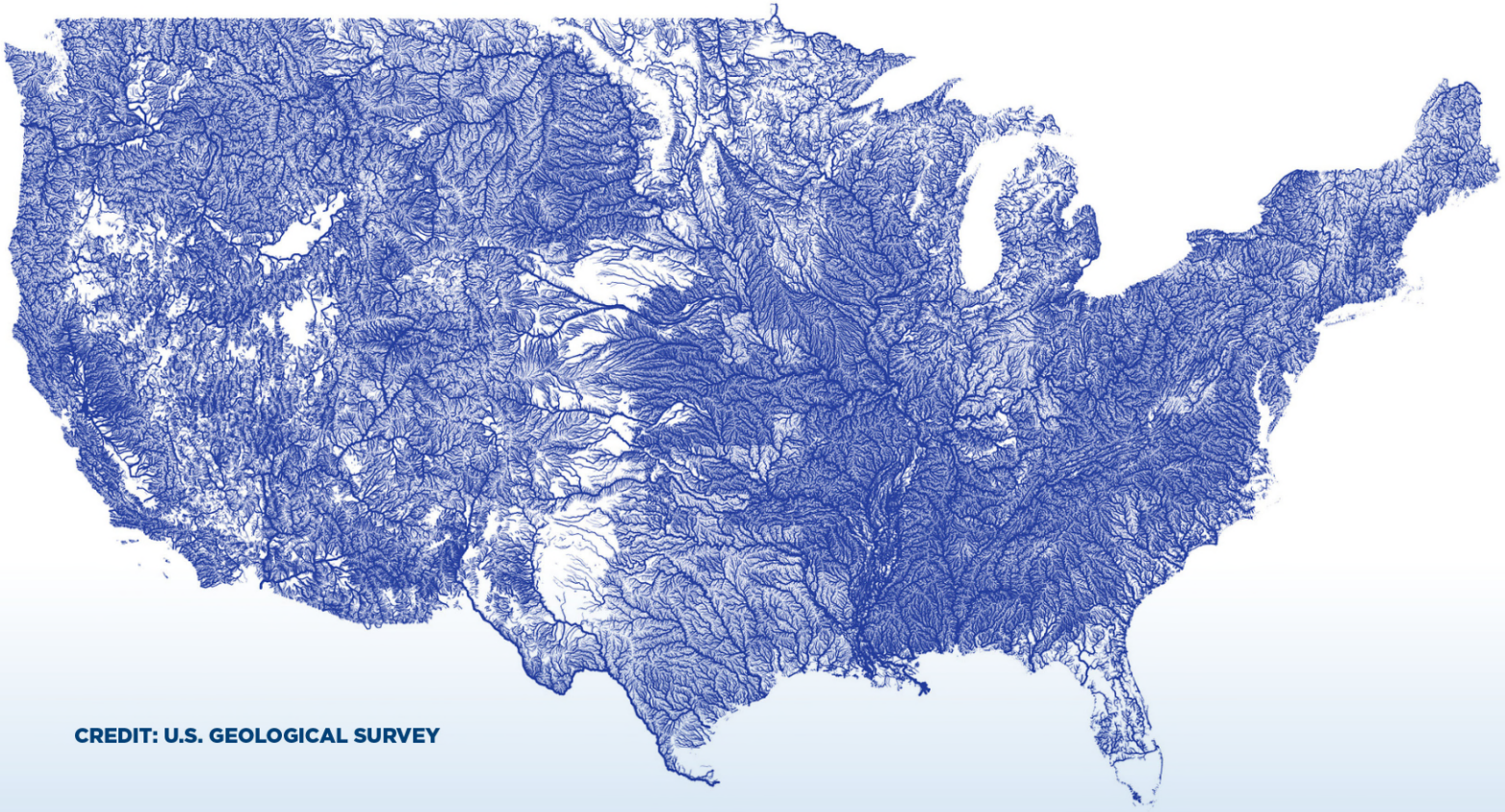
American Rivers

Rivers Connect Us

Lower Neuse River Basin Association
July 2016

American Rivers
Rivers Connect Us

U.S. Rivers and Streams

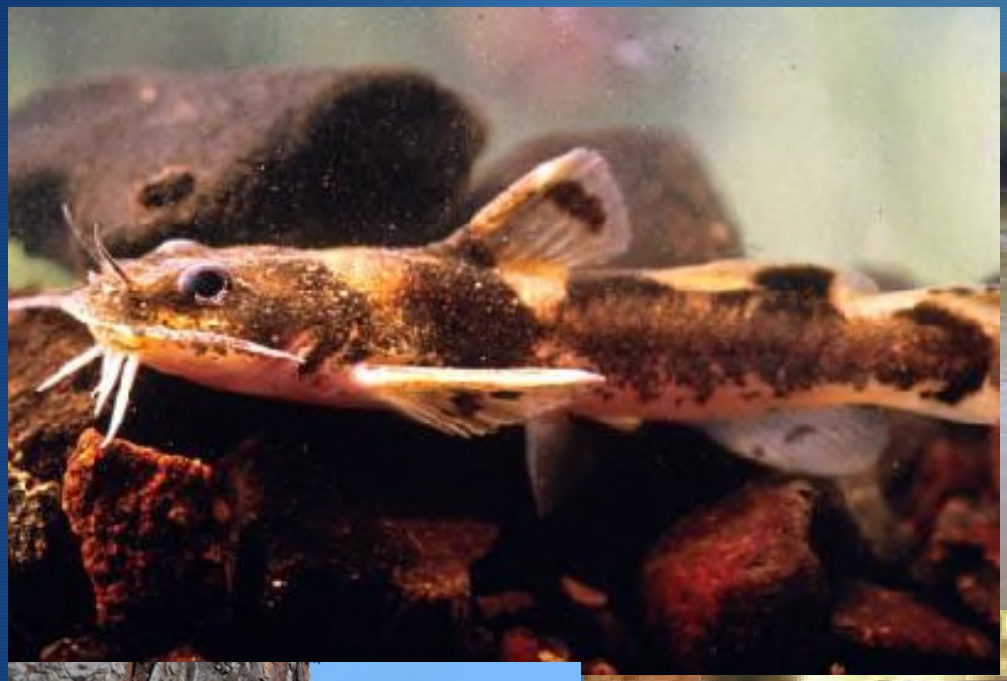


CREDIT: U.S. GEOLOGICAL SURVEY

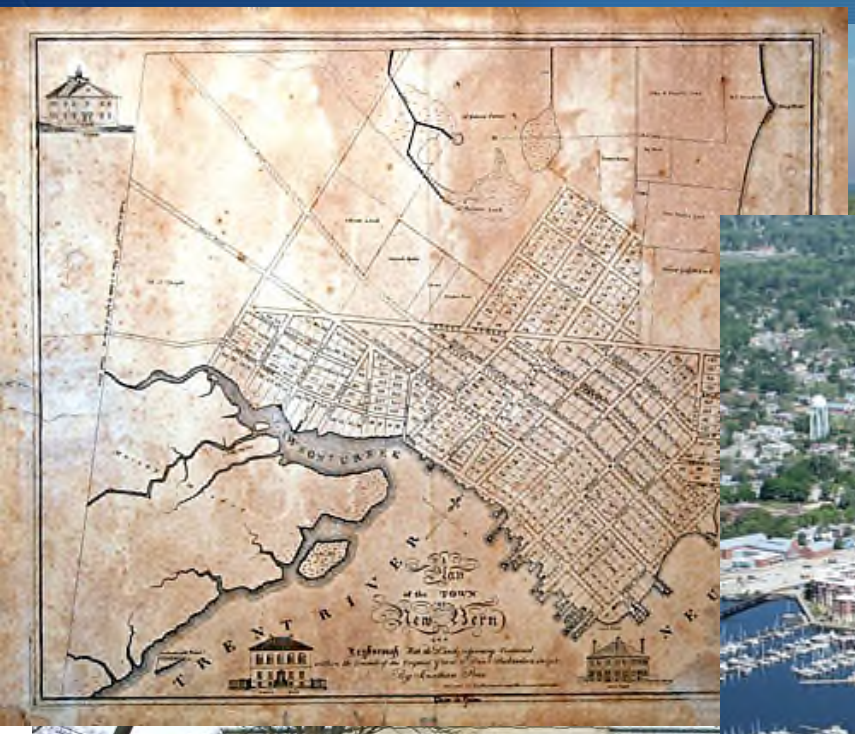
The choice for healthy rivers

Geology of the Neuse

Ecology of the Neuse



History of the Neuse



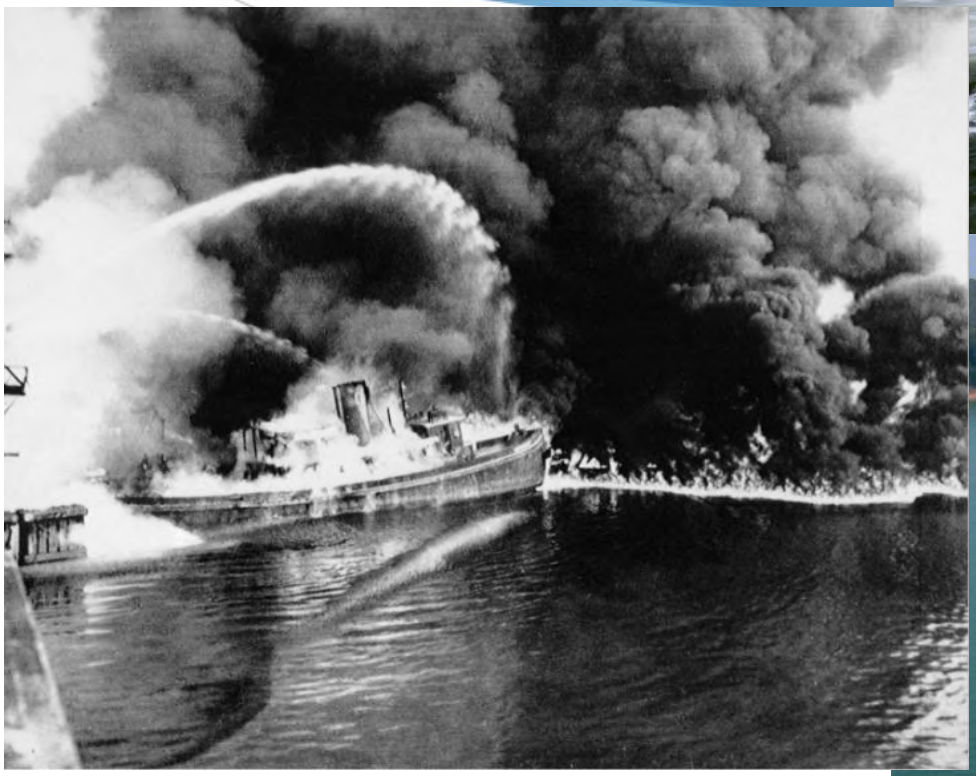
New Bern, NC

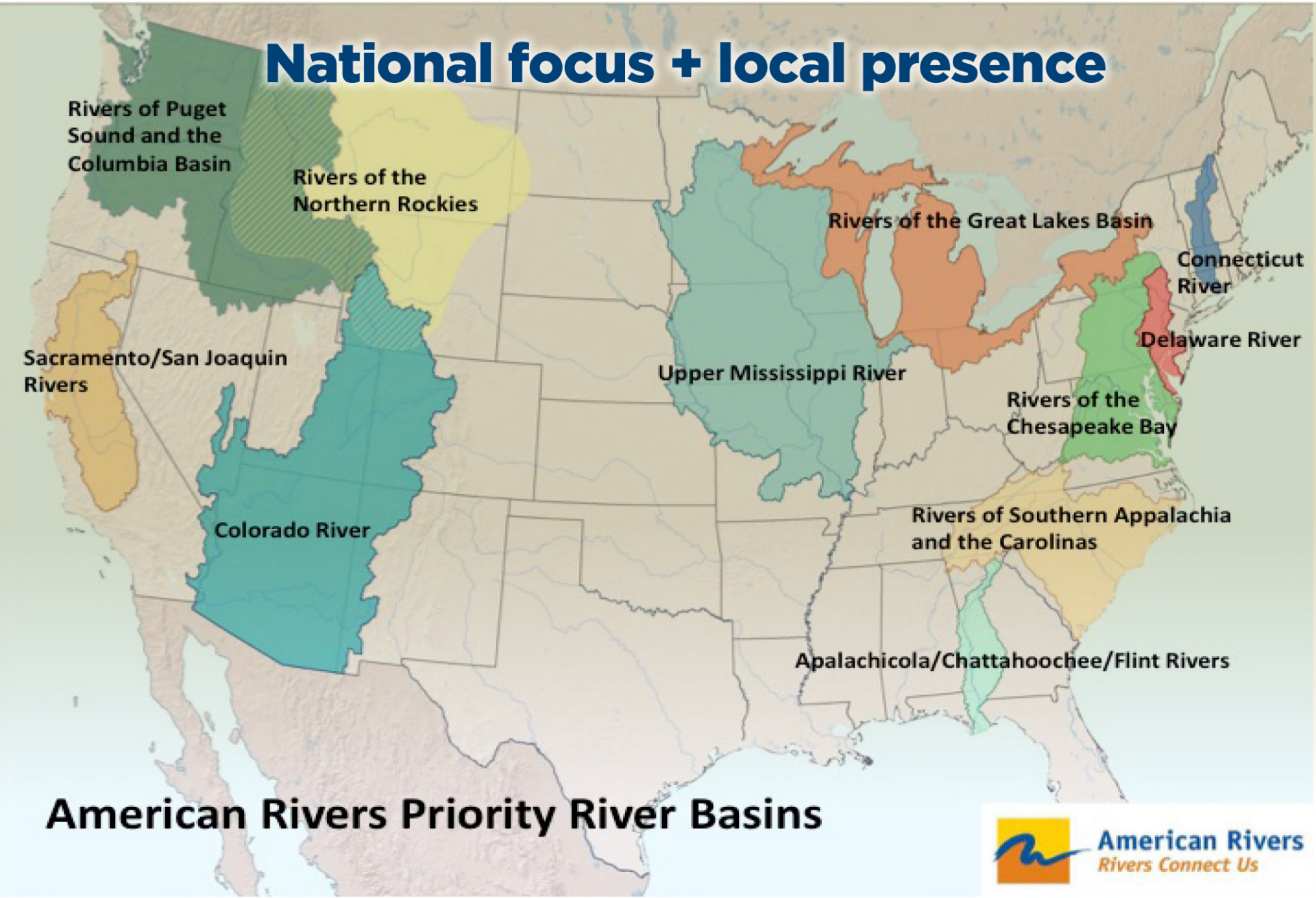
Historic Economy of the Neuse

NORTH CAROLINA Forestry Association

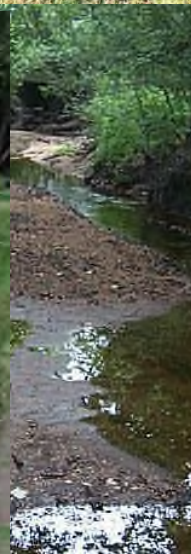
New Economy of the Neuse

Origins




National focus + local presence
Rivers of Puget Sound and the Columbia Basin
Rivers of the Northern Rockies
Rivers of the Great Lakes Basin
Connecticut River
Delaware River
Sacramento/San Joaquin Rivers
Upper Mississippi River
Rivers of the Chesapeake Bay
Colorado River
Rivers of Southern Appalachia and the Carolinas
Apalachicola/Chattahoochee/Flint Rivers
American Rivers Priority River Basins
American Rivers
Rivers Connect Us

American Rivers: What We Do

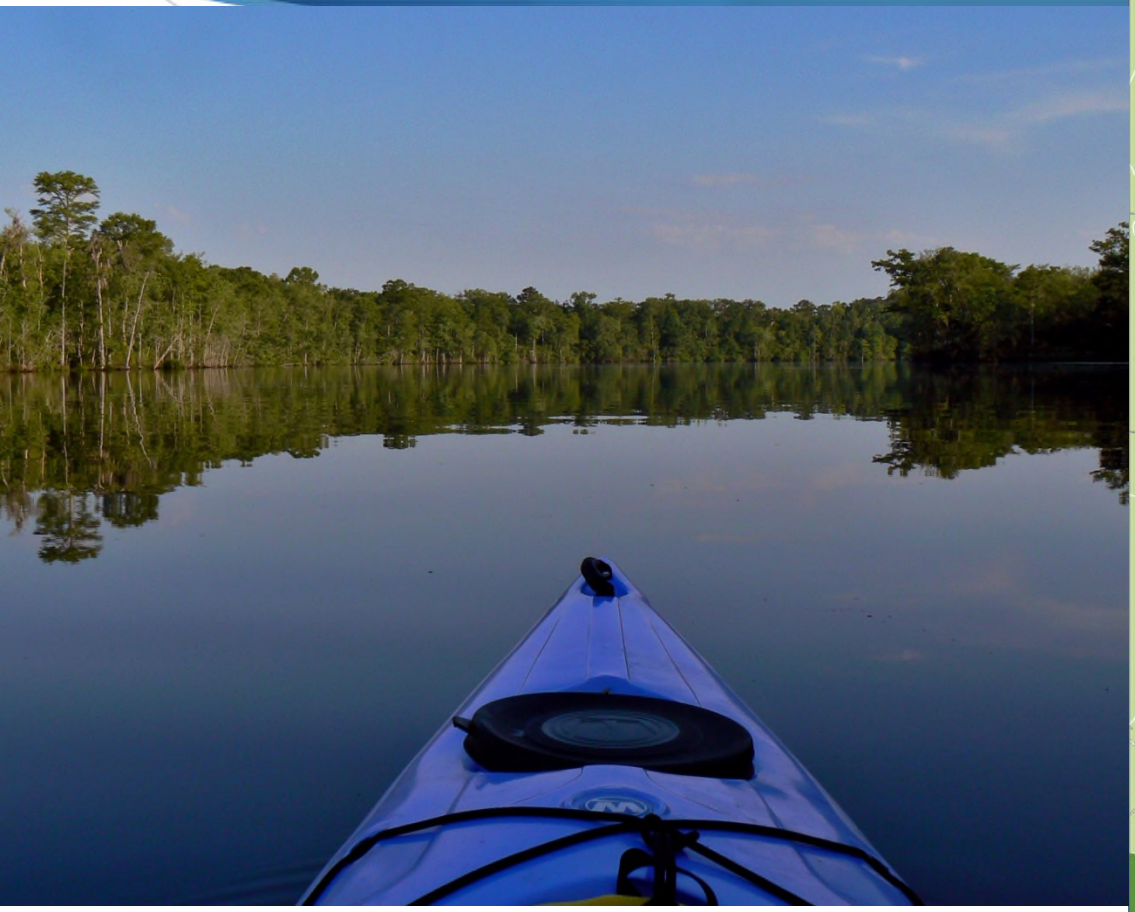


River Protection: Wild and Scenic Rivers

Lumber River, NC

New River, NC

River Protection: Blue Trails



Waccamaw River Blue Trail, NC & SC

National River Cleanup

National River Cleanup since 1991:

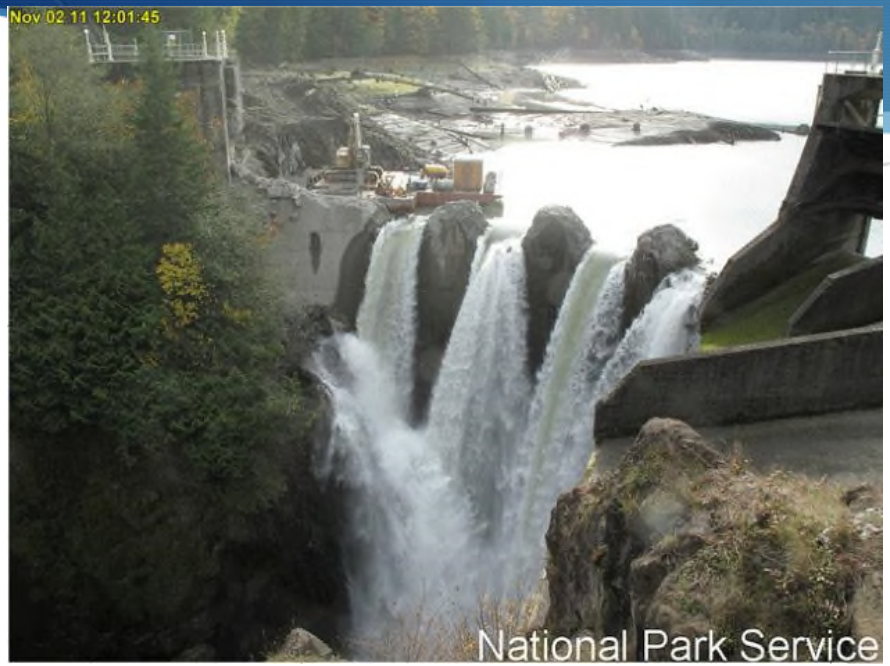
- +25 million pounds of trash removed
- 5,000+ sites
- 1.3 million volunteers
- 300,000 miles of river cleaned

River Restoration: Hydropower Reform

Catawba River, SC

Cheoah River, SC -
After flows were restored

River Restoration: Dam Removals

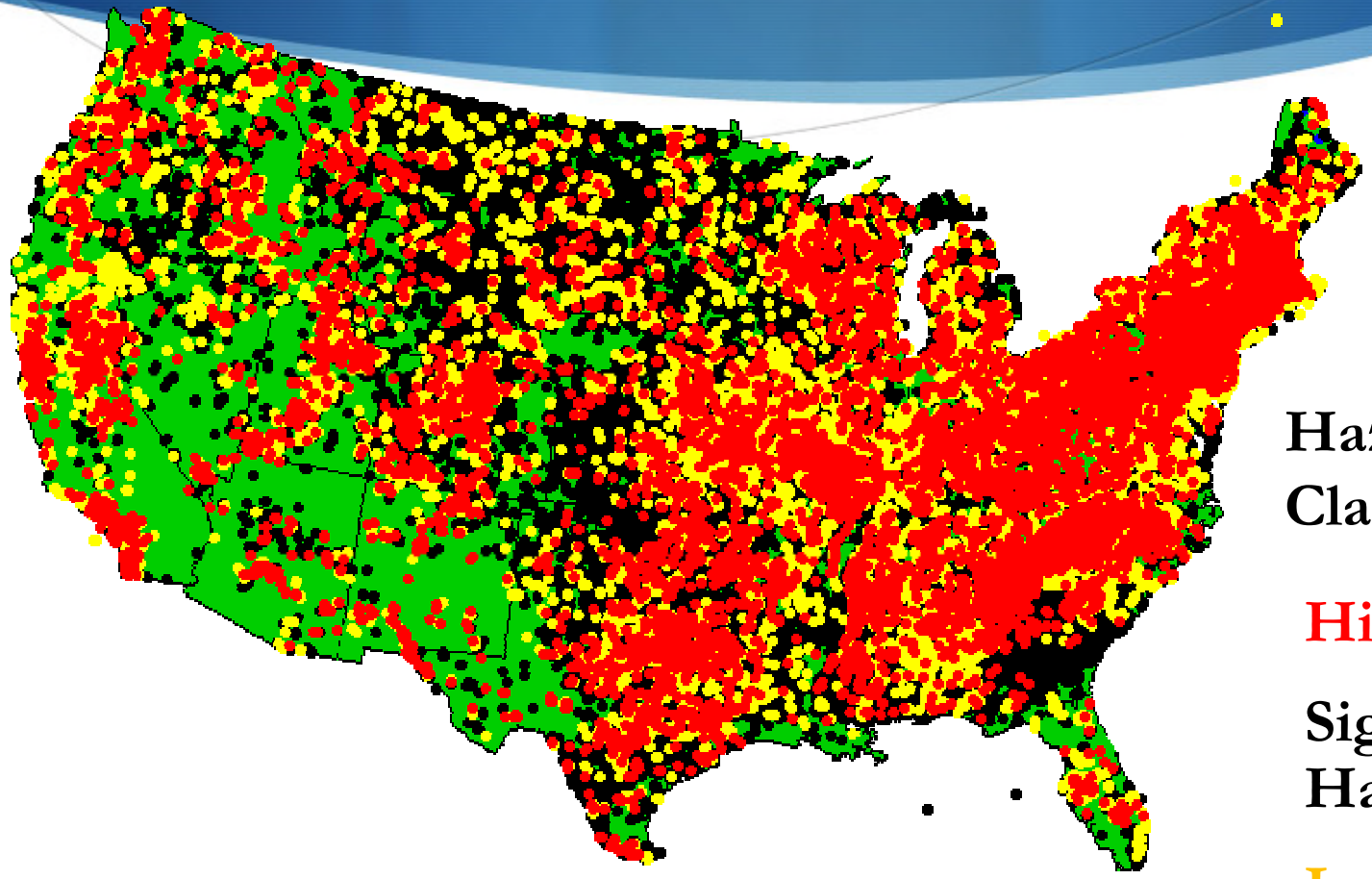


Glines Canyon Dam,
Elwha River, Washington

Veazie Dam,
Penobscot River, Maine

Dams in US

79,000 in Army Corps of Engineers' National Inventory of Dams Database



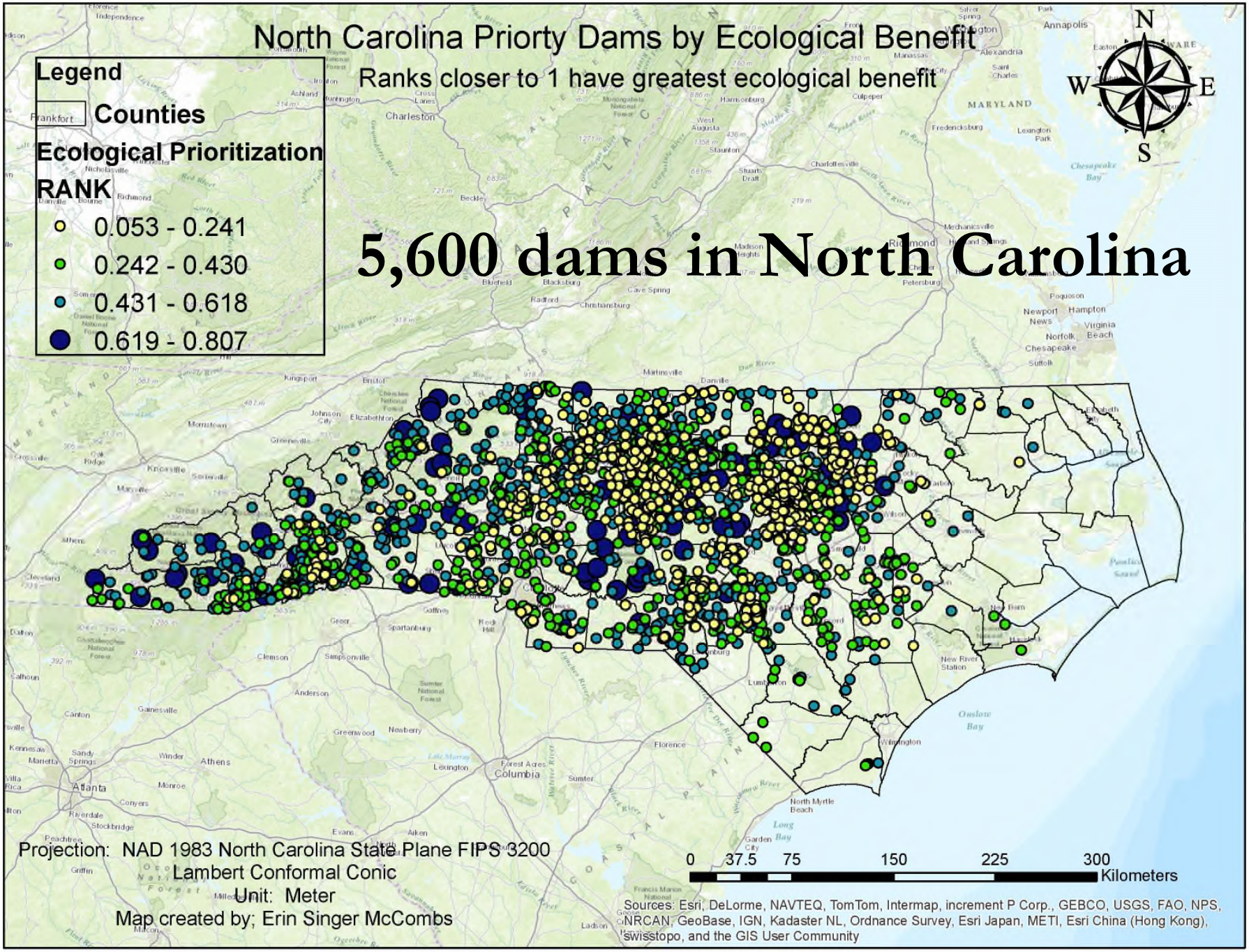
Hazard Classifications:

High Hazard

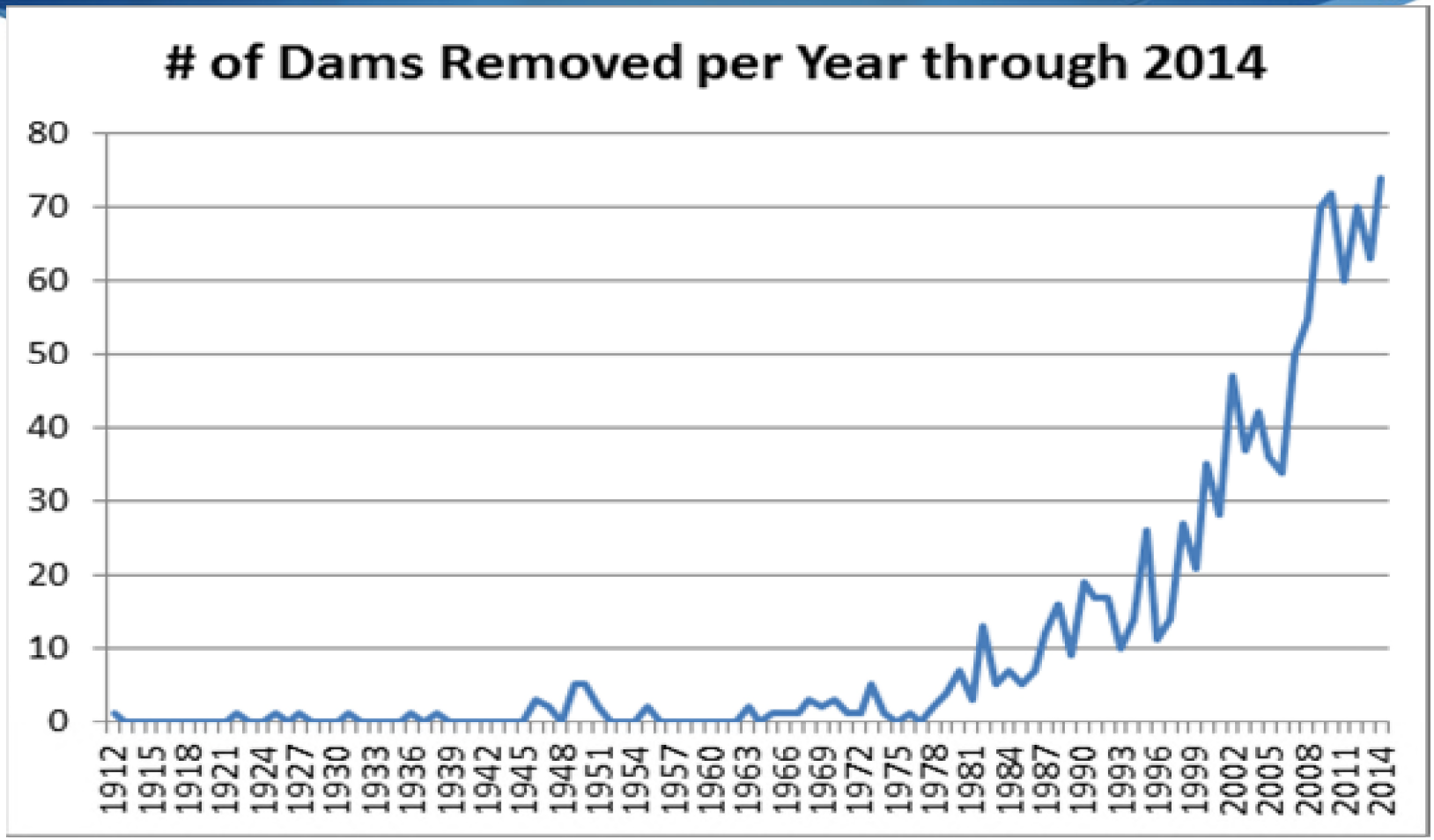
Significant Hazard

Low Hazard

79,000 dams that are >25 ft w/ 15ac-ft capacity or >6ft w/ 50ac-ft capacity


North Carolina Priorty Dams by Ecological Benefit
Ranks closer to 1 have greatest ecological benefit
Legend
Counties
Ecological Prioritization
RANK
0.053 - 0.241
0.242 - 0.430
0.431 - 0.618
0.619 - 0.807
5,600 dams in North Carolina
N
S
E
W
Projection: NAD 1983 North Carolina State Plane FIPS 3200
Lambert Conformal Conic
Unit: Meter
Map created by; Erin Singer McCombs
0 37.5 75 150 225 300
Kilometers
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Dam Removal Trends



Troy 1 Dam, Denson's Creek

Hitchcock Creek, NC – Steeles Mill Dam Removal

Lassiter Mill Dam, Uwharrie River

River Restoration: Floodplains

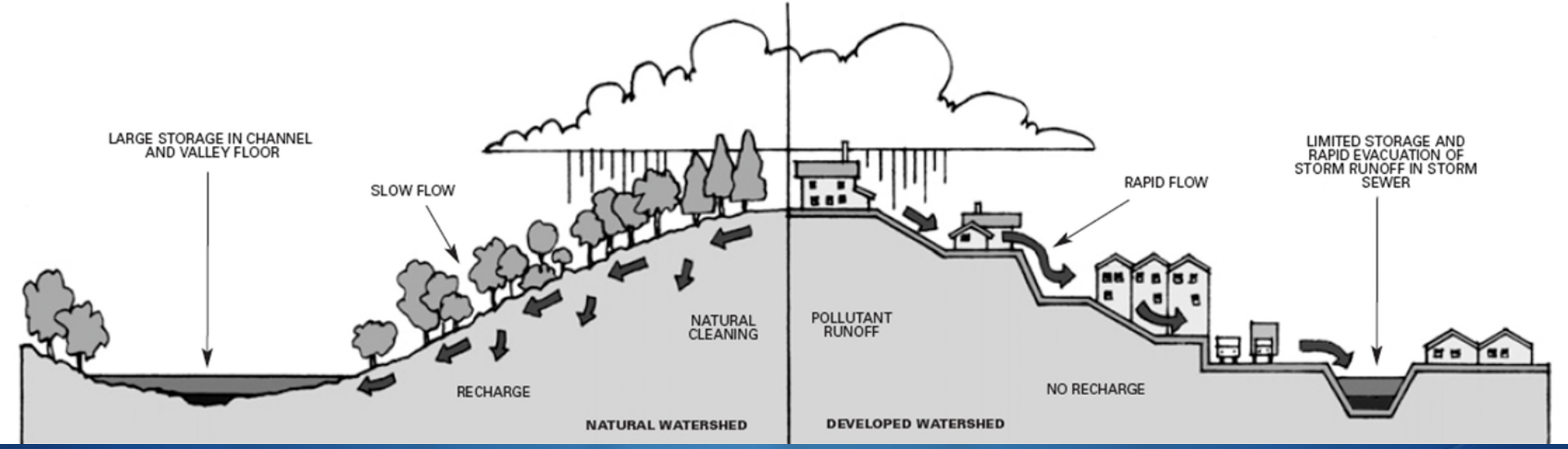
Hidden Valley Ranch, San Joaquin River

Channel reared vs. floodplain reared

Clean Water Supply

EPA WaterSense

Clean Water Supply: Natural vs. Urbanized Watersheds



Hydrological Impacts of Increased Runoff

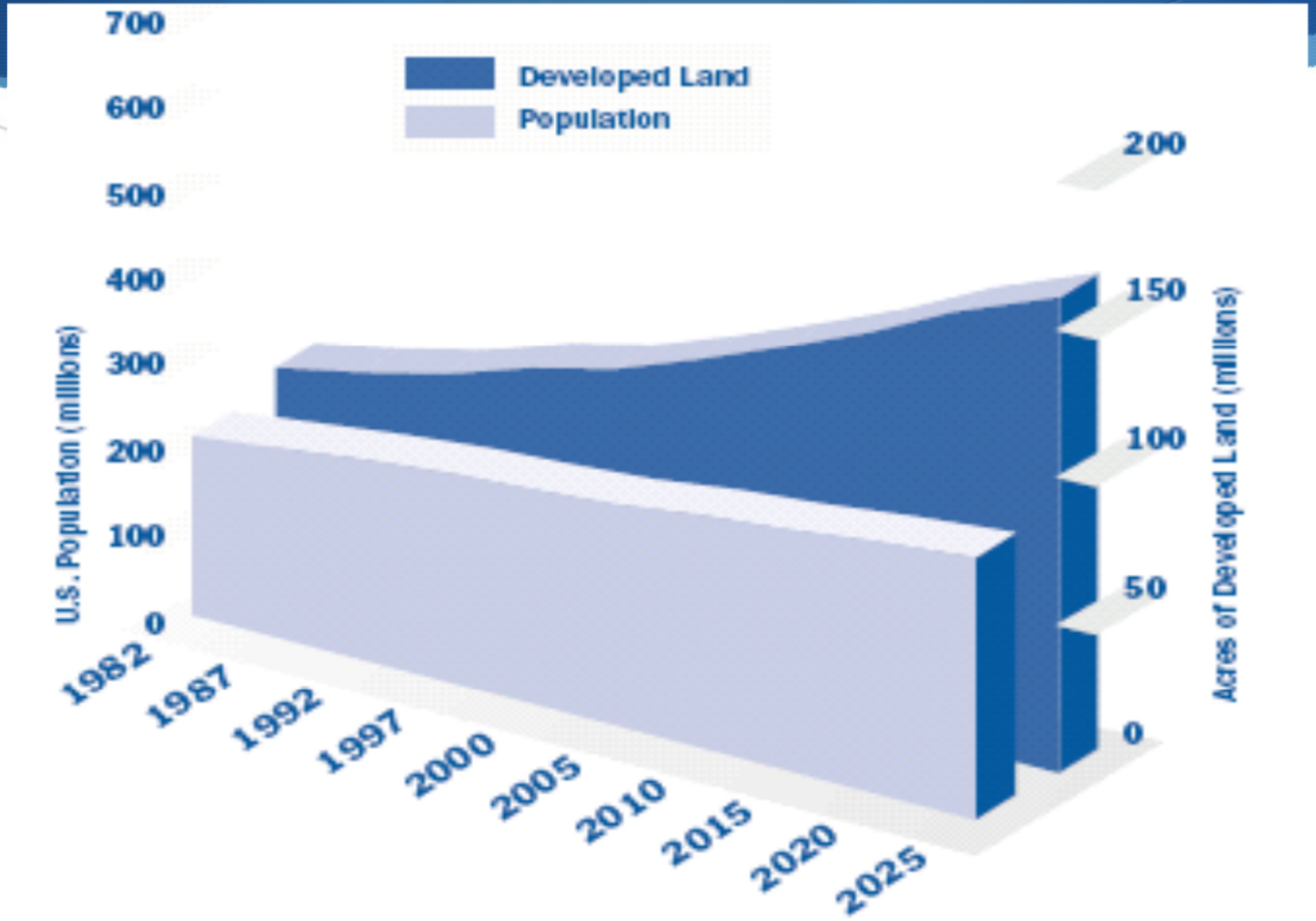
More freq
floodin

Lower baseflow

Increased flood peaks

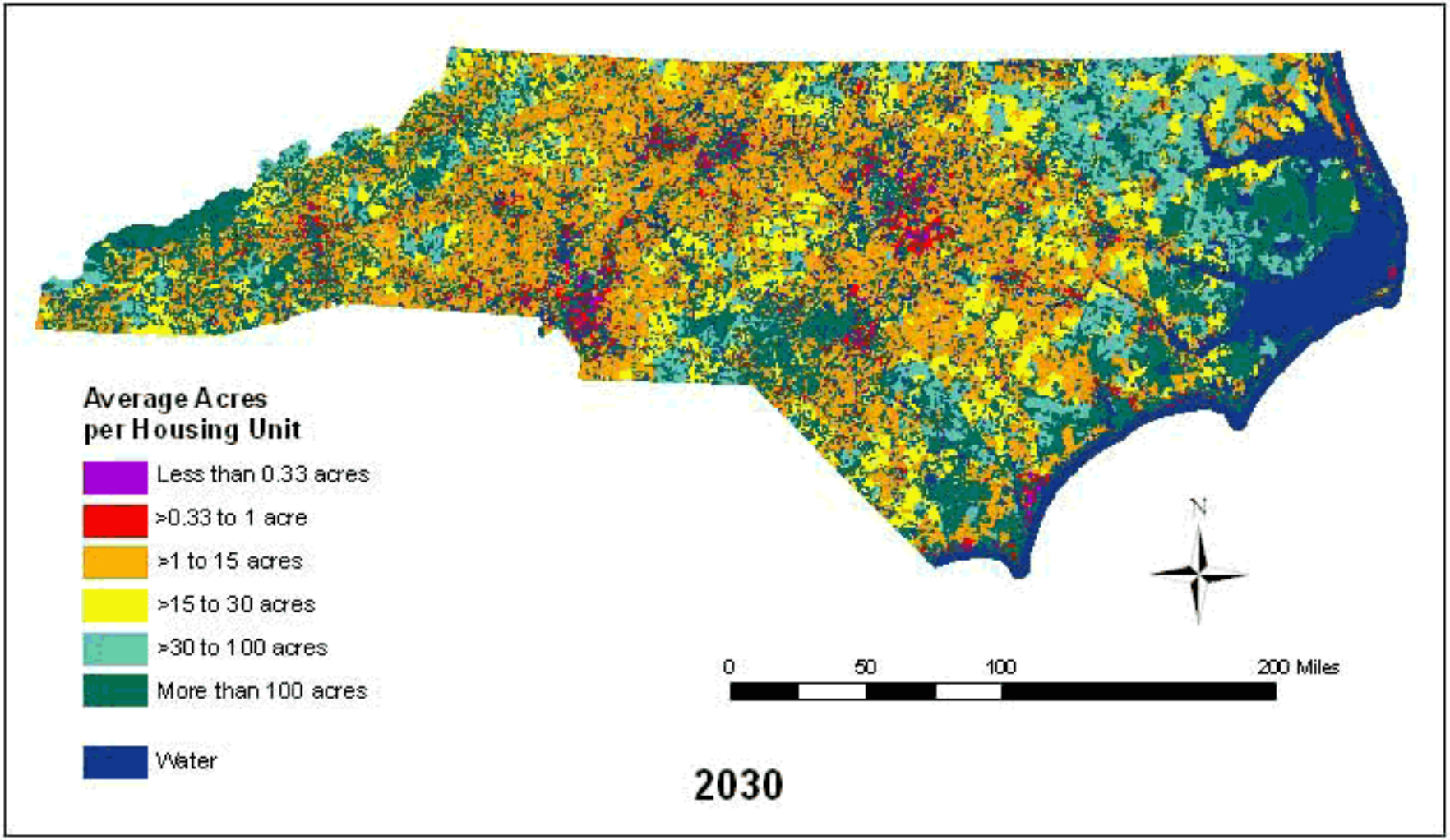
Credit:NRCS

Runoff: a growing problem



Sources: Data and extrapolations from National Resources Inventory, 2001; U.S. Census Bureau, 2000.

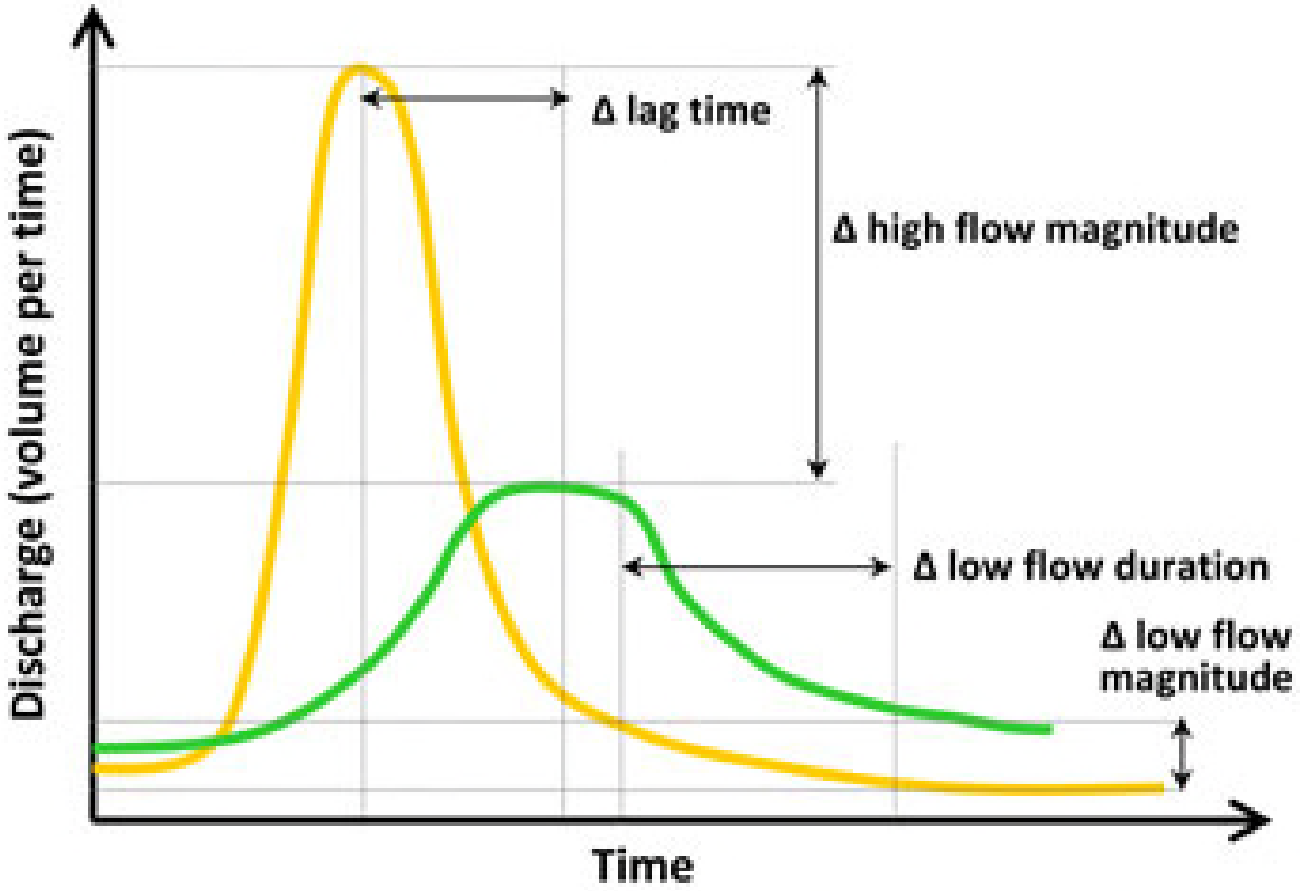
Projected Housing Density



Credit: Conservation Trust for North Carolina

Where is the Water Quality Management?

Clean Water Supply: Goal- Restore Natural Hydrology



Traditional Infrastructure

Green Stormwater Infrastructure

Stormwater control measures that harvest, infiltrate, and evapotranspirate stormwater are "critical to reducing the volume and pollutant loading of small storms."

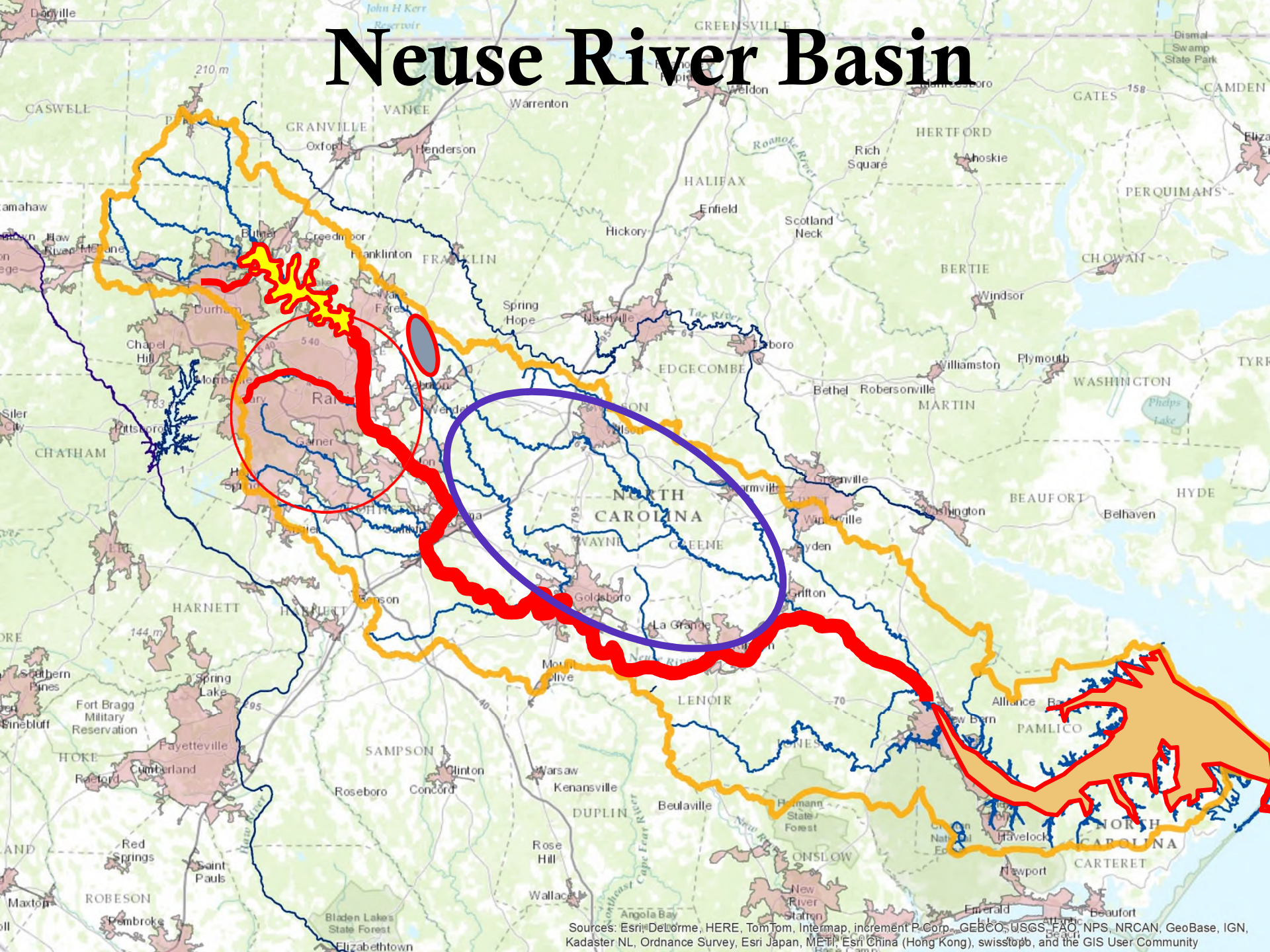
- National Research Council Report, 2008

Rain barrel, Delaware County, PA

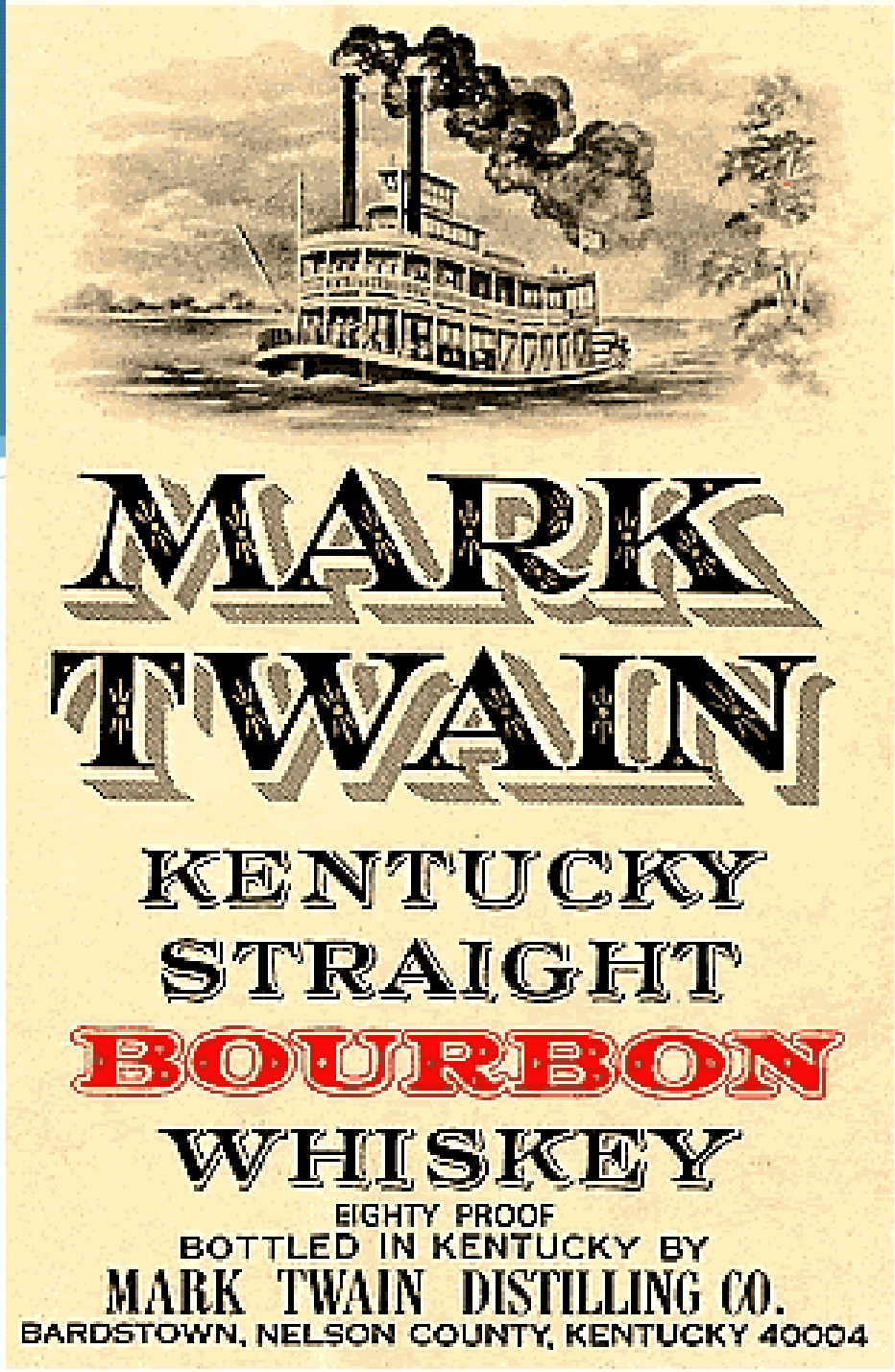
Green roof, Heinz Center, Pittsburgh, PA

Rain garden, Portland, OR

Neuse River Basin



"Whiskey is for drinking; water is for fighting over."



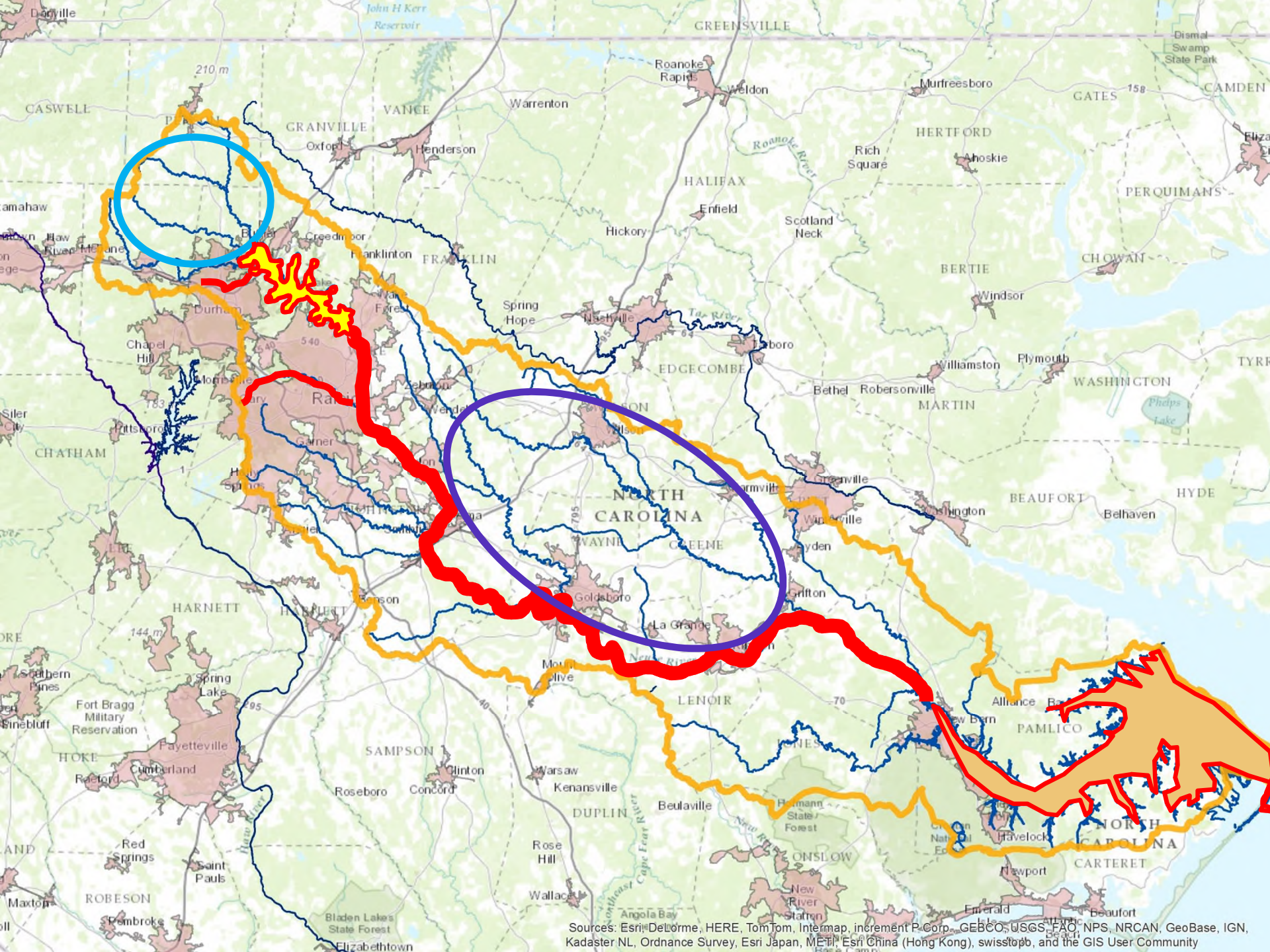
THE NEWS&OBSERVER

NORTH CAROLINA MARCH 25, 2015

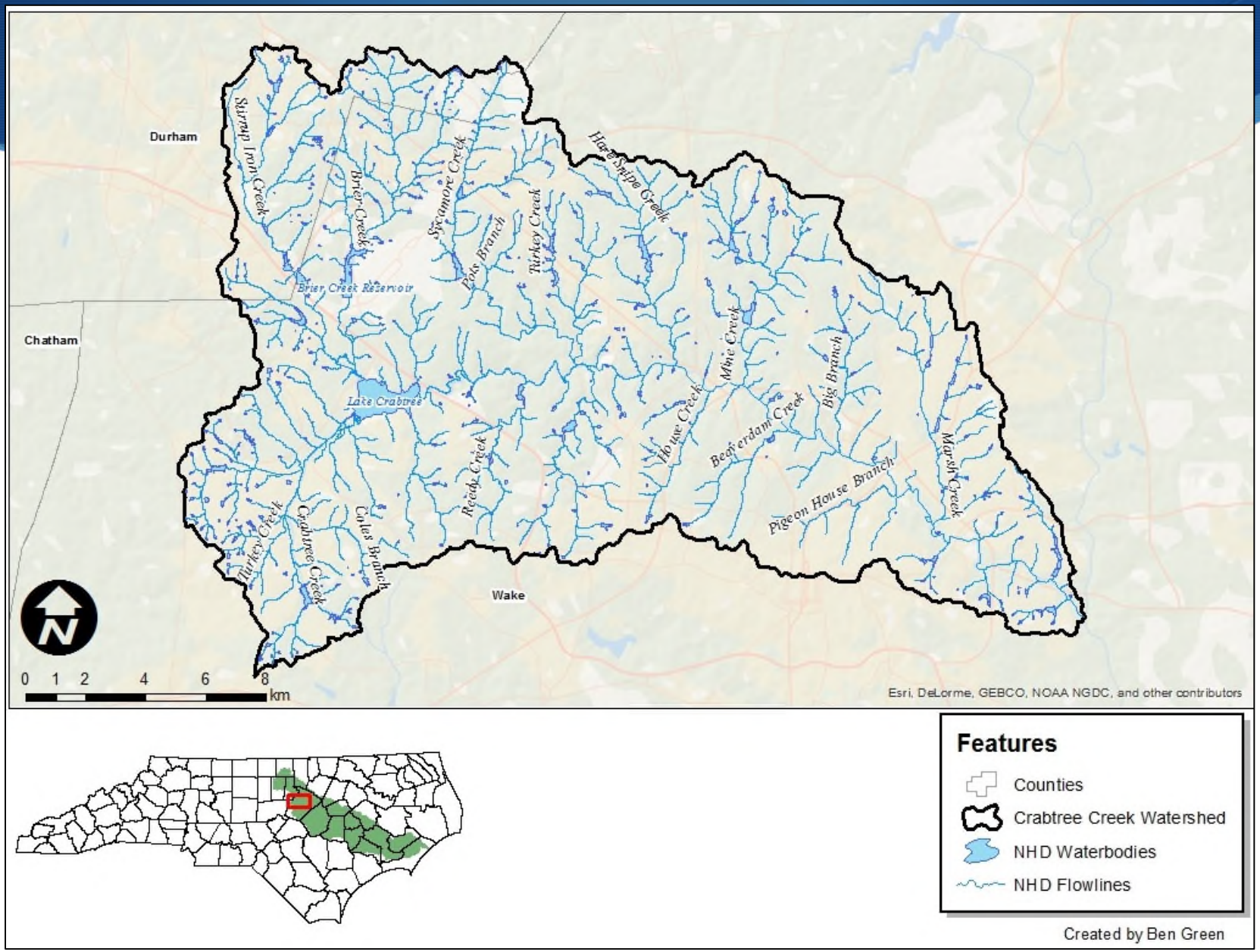
Wake leads population growth in North Carolina

BY RICHARD STRADLING AND DAVID RAYNOR
rstradling@newsobserver.com
draynor@newsobserver.com

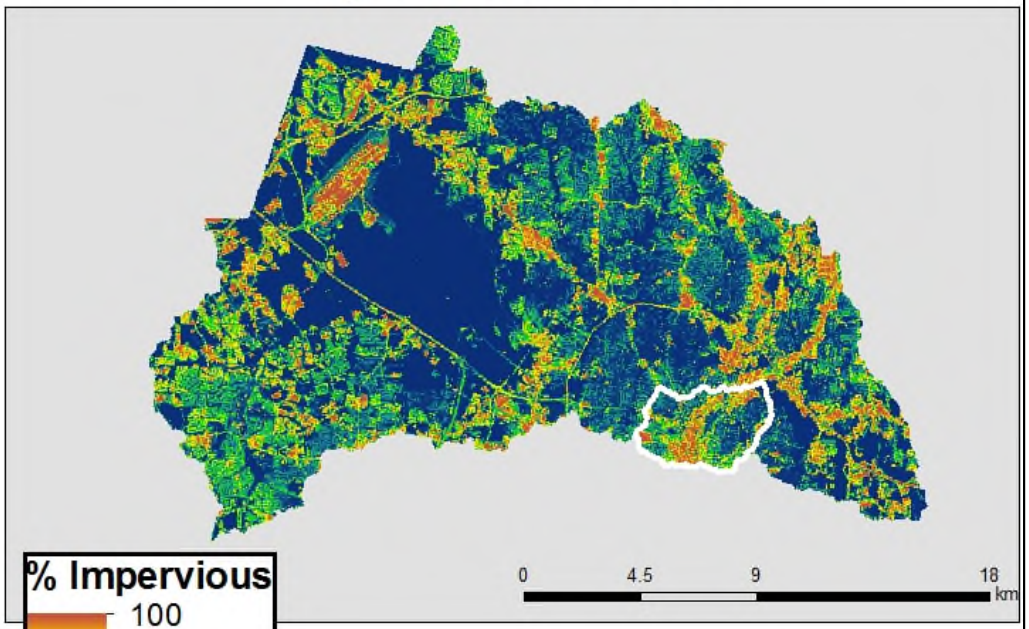
RALEIGH — The metro area anchored by Wake County was the 15th fastest-growing metro area in the country in the year ending July 1, according to the latest population estimates from the U.S. Census Bureau.

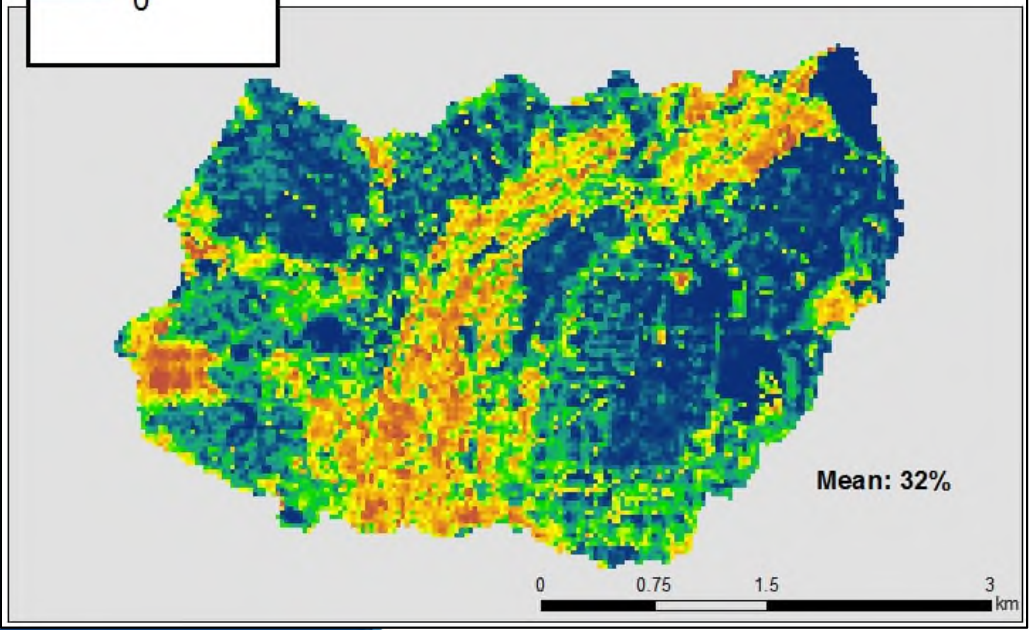

Danville
John H Kerr Reservoir
GREENSVILLE
Dismal Swamp State Park
210 m
Roanoke Rapids
Weldon
Murfreesboro
CASWELL
VANCE
Warrenton
GRANVILLE
GATES
158
CAMDEN
Oxford
Henderson
HERTFORD
Roanoke River
Rich Square
Ahoskie
HALIFAX
PERQUIMANS
Enfield
Scotland Neck
Hickory
Creedmoor
Franklinton
FRANKLIN
BERTIE
CHOWAN
Durham
Spring Hope
Nashville
Windsor
Chapel Hill
Tar River
EDGECOMBE
Williamston
Plymouth
WASHINGTON
Bethel
Robersonville
MARTIN
Siler City
Pittsboro
CHATHAM
Raleigh
Wilson
Greenville
NORTH CAROLINA
BEAUFORT
HYDE
Belhaven
WAYNE
GREENE
Goldsboro
Grifton
HARNETT
Benson
La Grange
144 m
Southern Pines
Spring Lake
Fort Bragg Military Reservation
LENOIR
Alliance
PAMLICO
Sinebluff
Fayetteville
HOKE
Cumberland
Raeford
SAMPSON
Clinton
Concord
Roseboro
Warsaw
Kenansville
Beulaville
DUPLIN
Holmann State Forest
Havelock
NORTH CAROLINA
ONSLOW
CARTERET
Red Springs
Saint Pauls
Rose Hill
Newport
ROBESON
Maxton
Pembroke
Wallace
New River State Forest
Emerald Isle
Beaufort
Bladen Lakes State Forest
Elizabethtown
Angola Bay
Southeast Cape Fear River
Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

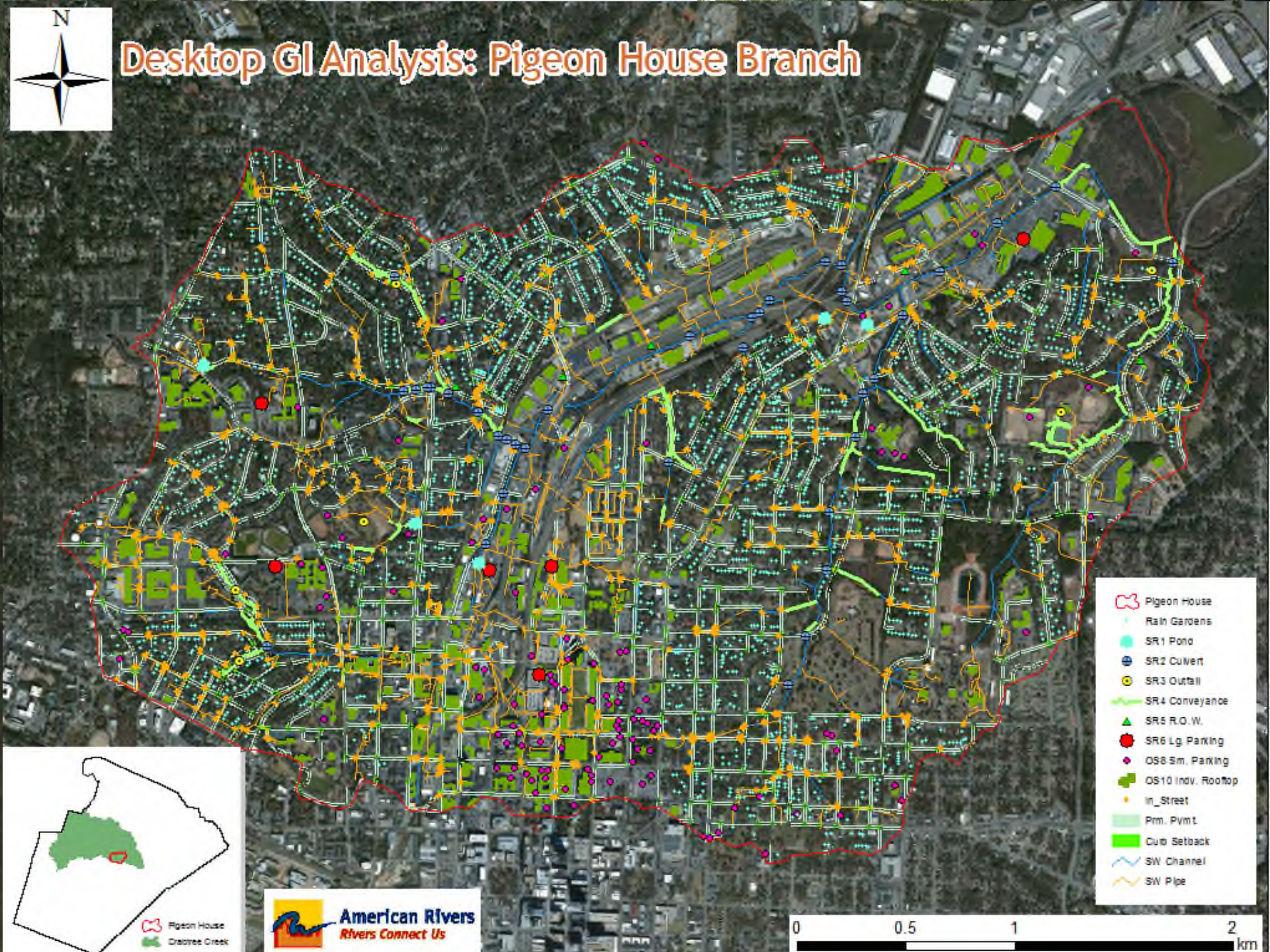
Crab Tree Creek



Impervious Surfaces: Crabtree Creek and Pigeon House Branch






N
Desktop GI Analysis: Pigeon House Branch
Pigeon House
Rain Gardens
SR1 Pond
SR2 Culvert
SR3 Outfall
SR4 Conveyance
SR5 R.O.W.
SR6 Lg. Parking
OS8 Sm. Parking
OS10 Indv. Rooftop
In_Street
Prm. Pvmt.
Curb Setback
SW Channel
SW Pipe
Pigeon House
Crabtree Creek
American Rivers
Rivers Connect Us
0
0.5
1
2
km

Raleigh Green Infrastructure Strategic Plan

Advancing Green Infrastructure and Low Impact Development in Raleigh: Overview of the Process and Work Plan for Next Steps

City of Raleigh
Public Works Department
Stormwater Management Division

Reoperation of Falls Lake Reservoir

Current Water Supply:

- 65 mgd
- 45,000 AF

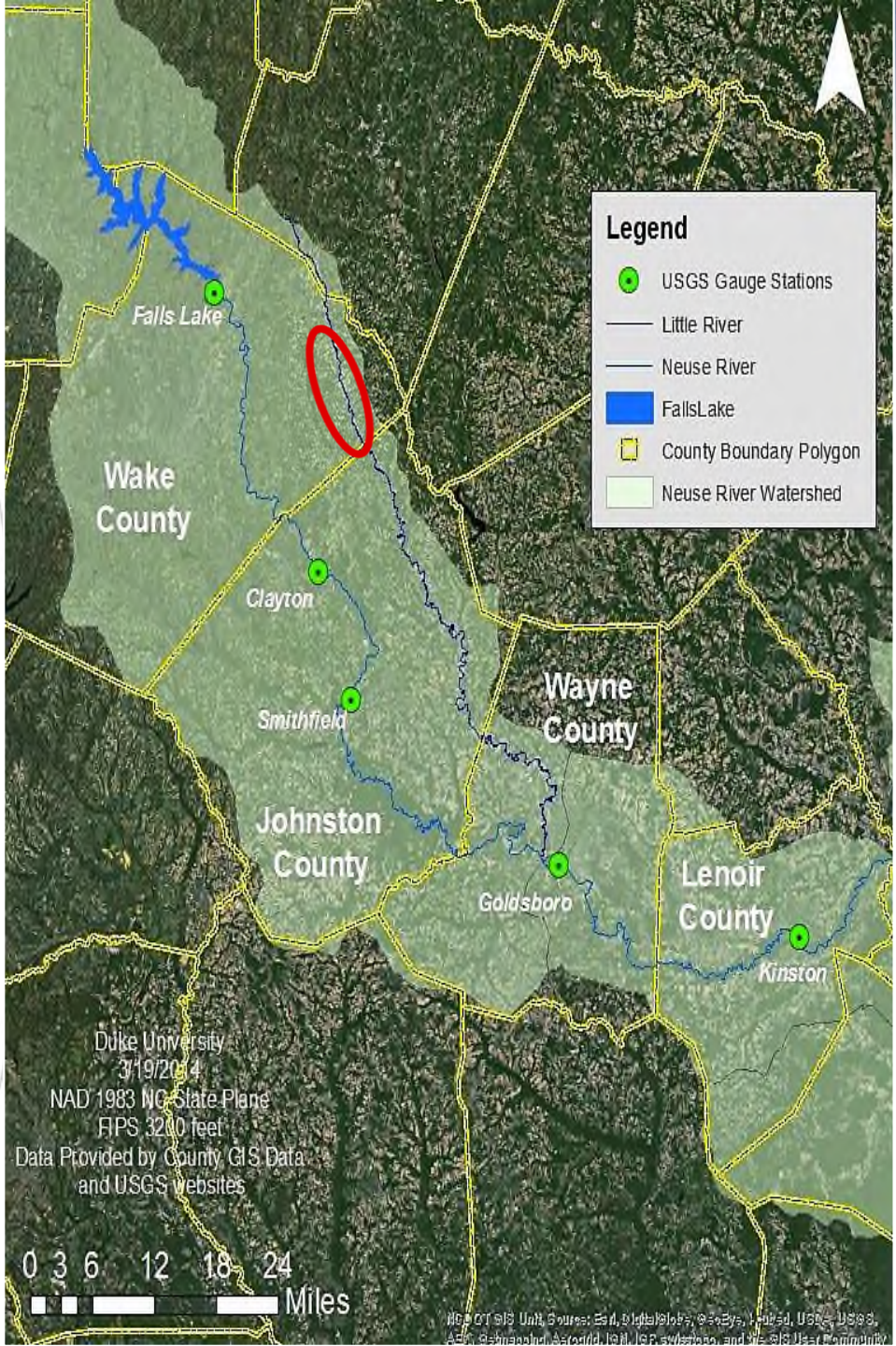
Little River Reservoir

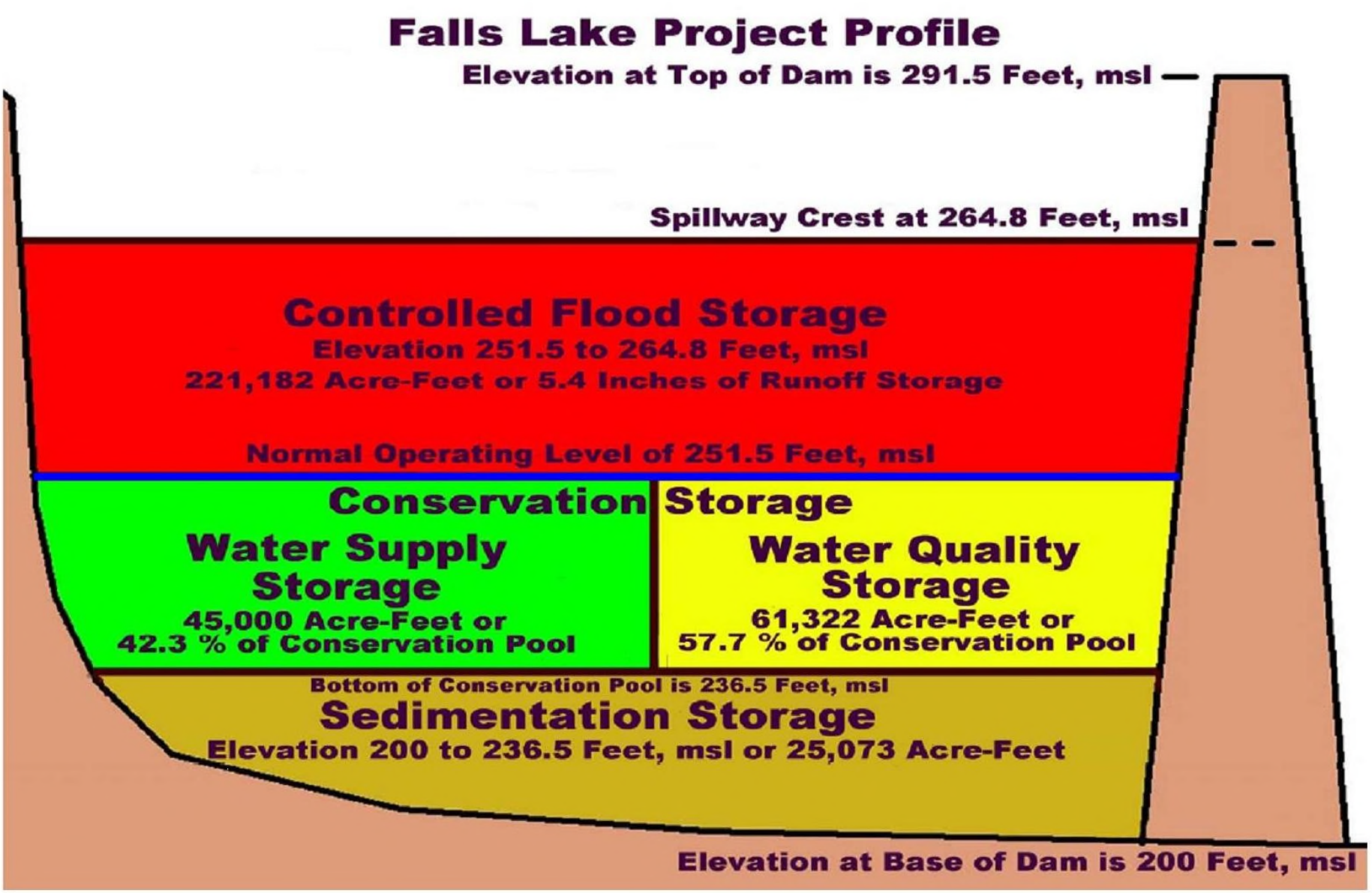
Reservoir Information:

- 13.7 mgd for water supply
- Cost: ~$300 million (and climbing)
- Supply Coverage: ~20 years

Environmental Impacts:

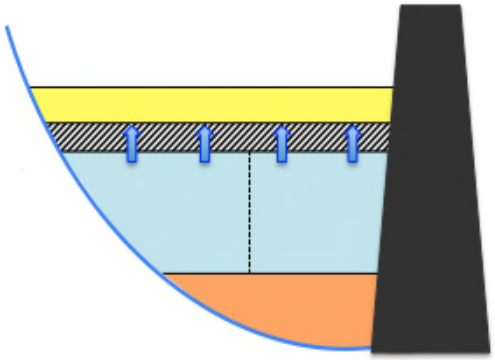
- Inundate 650 acres of forested wetlands
- Inundate 10.5 miles of streams.
- Threaten species: salamander, mussels, catfish



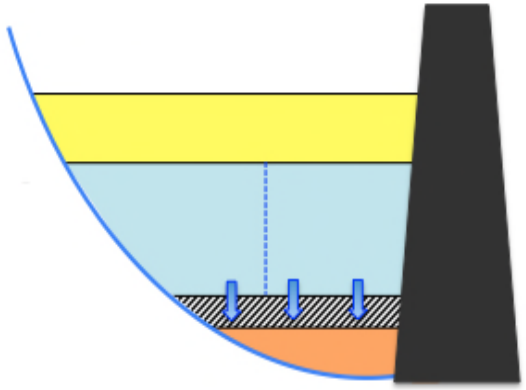

Falls Lake Project Profile
Elevation at Top of Dam is 291.5 Feet, msl
Spillway Crest at 264.8 Feet, msl
Controlled Flood Storage
Elevation 251.5 to 264.8 Feet, msl
221,182 Acre-Feet or 5.4 Inches of Runoff Storage
Normal Operating Level of 251.5 Feet, msl
Conservation Storage
Water Supply Storage
45,000 Acre-Feet or
42.3 % of Conservation Pool
Water Quality Storage
61,322 Acre-Feet or
57.7 % of Conservation Pool
Bottom of Conservation Pool is 236.5 Feet, msl
Sedimentation Storage
Elevation 200 to 236.5 Feet, msl or 25,073 Acre-Feet
Elevation at Base of Dam is 200 Feet, msl

Reallocation Options

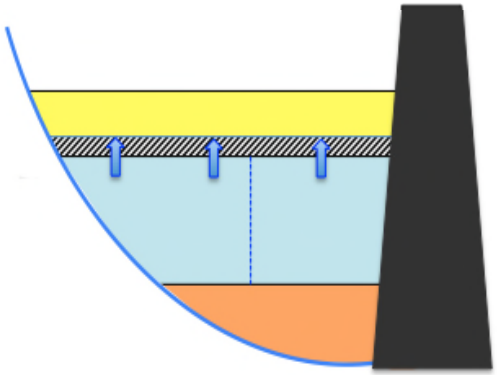
1. Permanent Flood Control Pool Reallocation



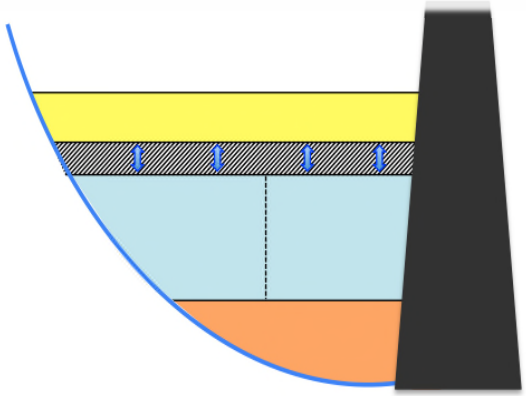
2. Sedimentation Pool Reallocation



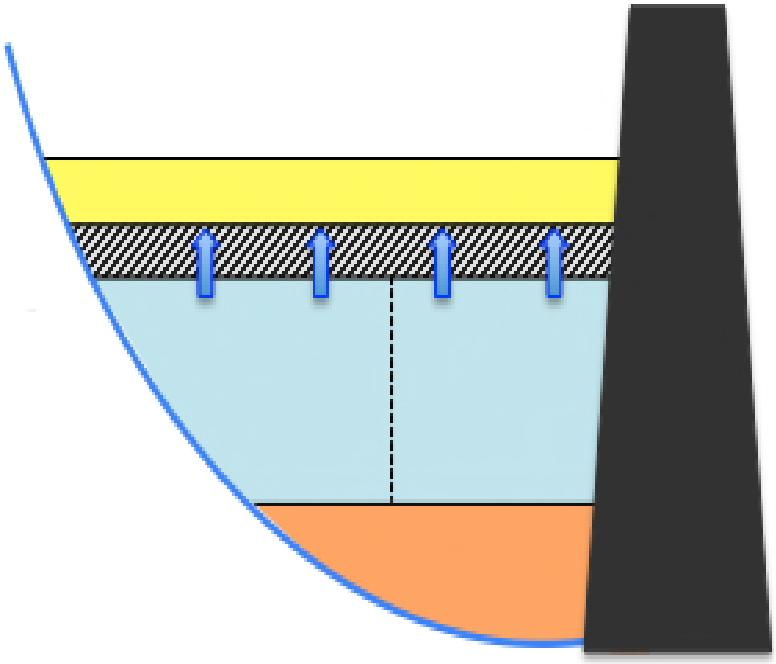
3. Seasonal Guide Curve



4. Dynamic/Event Management

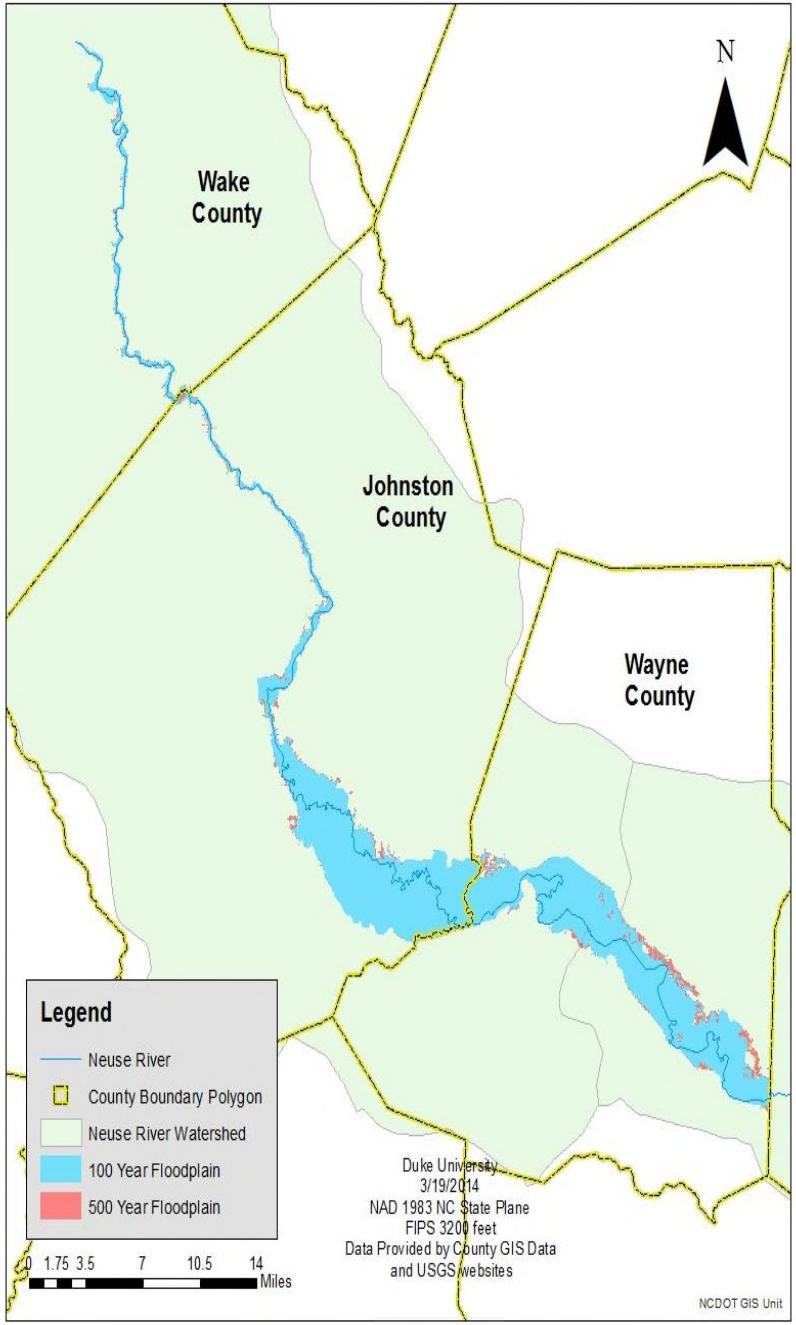


Permanent Flood Control Pool Reallocation

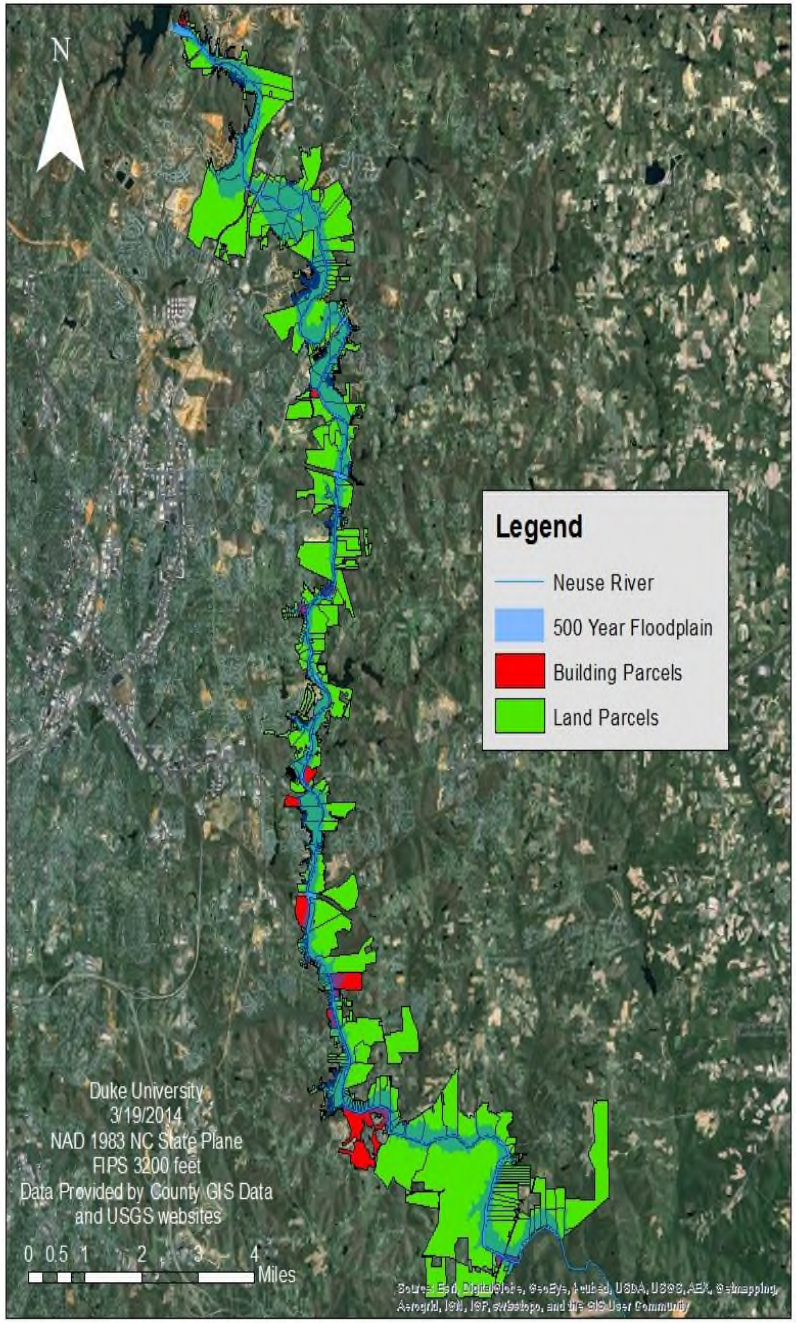


Elevation (Feet)	Total Water Storage (Acre Feet)	Added Water Storage (Acre Feet)	Additional Water Supply (MGD)	Elevation Increase (Feet)
251.5	131,395.00	-	-	-
251.9	136,328.08	4,933.08	4.40	0.40
252.3	141,376.71	9,981.71	8.91	0.80
252.7	146,540.89	15,145.89	13.52	1.20
253.1	151,820.62	20,425.62	18.23	1.60
253.5	157,215.90	25,820.90	23.05	2.00
253.9	162,726.73	31,331.73	27.97	2.40

Neuse River Floodplain Analysis



Wake County Parcels that Intersect the 500 Year Floodplain



Reconnecting the River…

- ✓ **Protect**: Floodplain acquisition through buyouts and relocations to restore beneficial functions of floodplains, establish greenways, parks, recreational space.
- ✓ **Restore**: Setting levees back, retiring sensitive agricultural lands, and restoring riparian vegetation increases storage.
- ✓ **Replicate**: Implementing green infrastructure and working with nature reduces flood flows and enhance water quality.

Thank you!

Questions?

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www.americanrivers.org