SUSTAINABLE & HEALTHY COMMUNITIES RESEARCH PROGRAM

Key Challenges in the Southeastern US

Incorporating Bioenergy into Sustainable Landscape Designs

Jessica Daniel
Communications Support Contractor, EnviroAtlas
USEPA, ORD, National Exposure Research Laboratory

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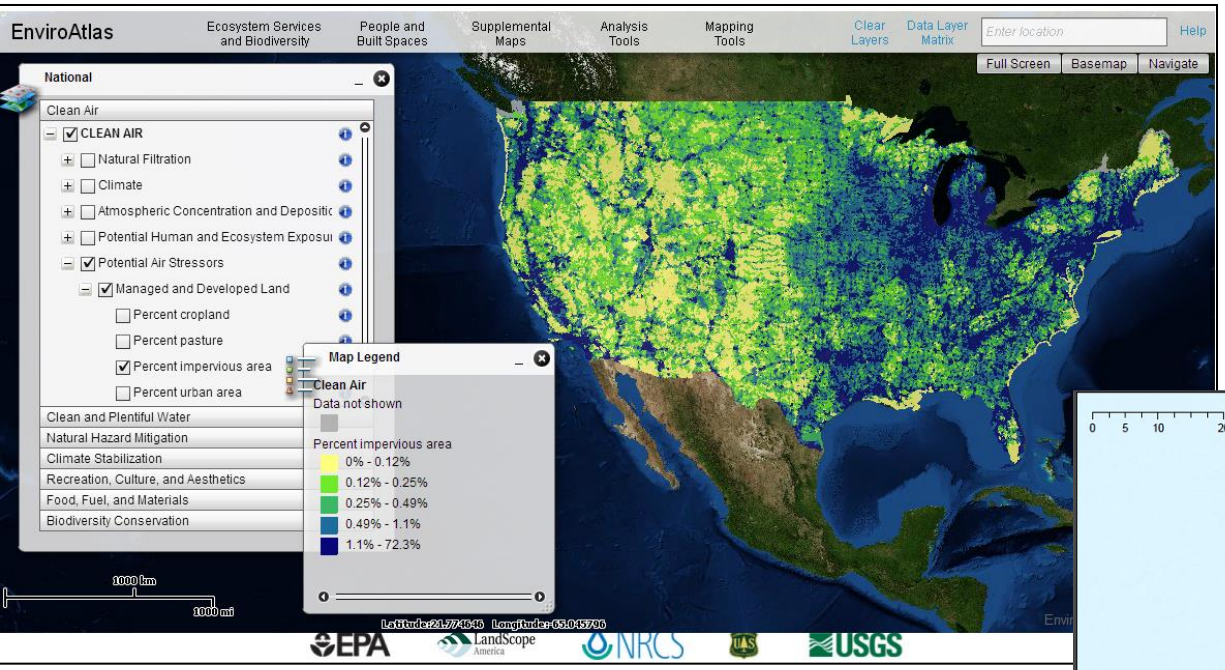
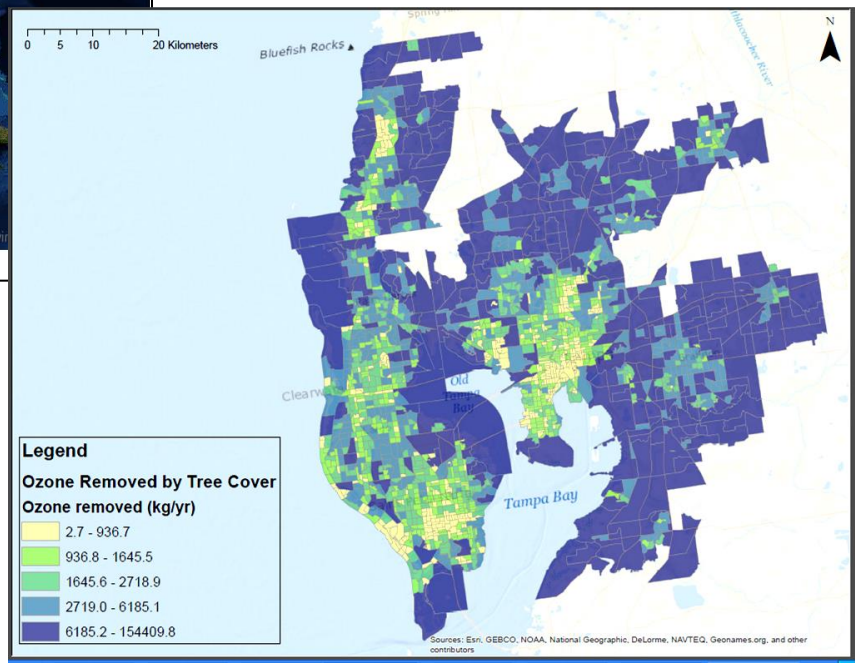
What is EnviroAtlas?

A collection of tools and resources that provides data, research, and analysis on the relationships between nature, people, health, and the economy.



National: Wall-to-wall coverage for conterminous US; summarized by subwatershed (12 digit HUCs)

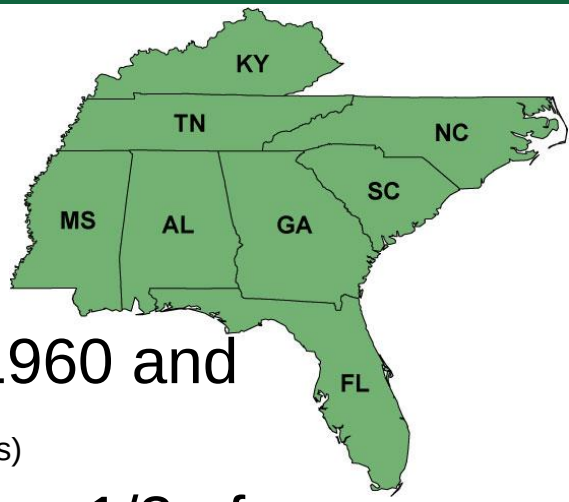


Community: High resolution for selected population places; summarized by census block group

EnviroAtlas can be used to consider multiple factors in a systems framework

- Identify areas with multiple environmental assets
- Determine priority areas
- Look at current land cover types
- Consider environmental stressors
- Plan for the future

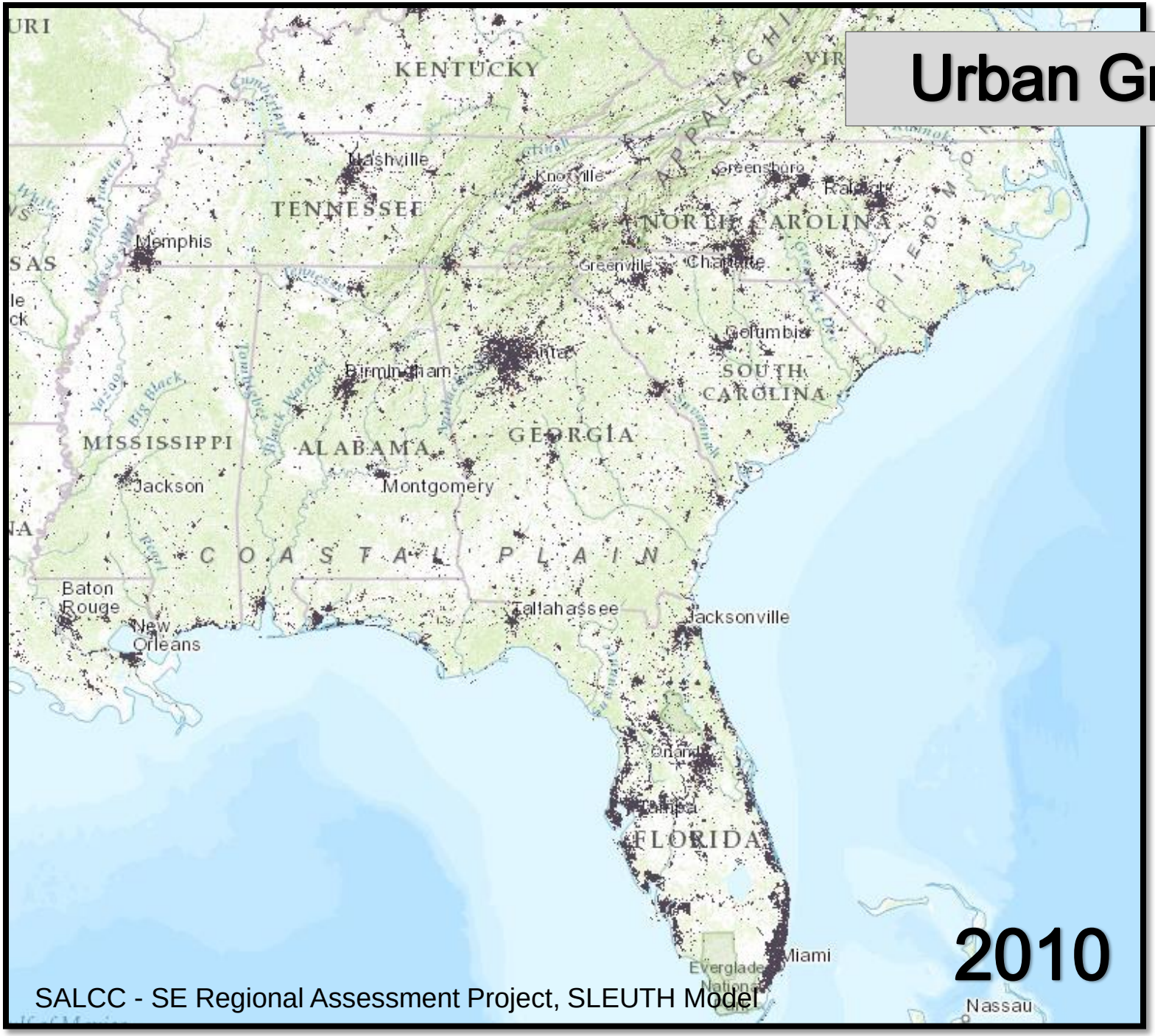
Southeast



- **More than 70 million people** - Between 1960 and 2000, the population almost doubled (US Census)
- Has 1/3 of the remaining wetlands as well as 1/3 of the nation's coastline in the lower 48 states
- Coastal resources provide habitat for 98% of the U.S.'s commercial marine species
- Houses 2% of the world's forest cover and produces 25% of the world's pulpwood and 18% of its industrial timber (USFS Timber Products Output database and report, 2007)

Growth and land use changes, Fragmentation, Impacts on biodiversity, Effects on air and water resources

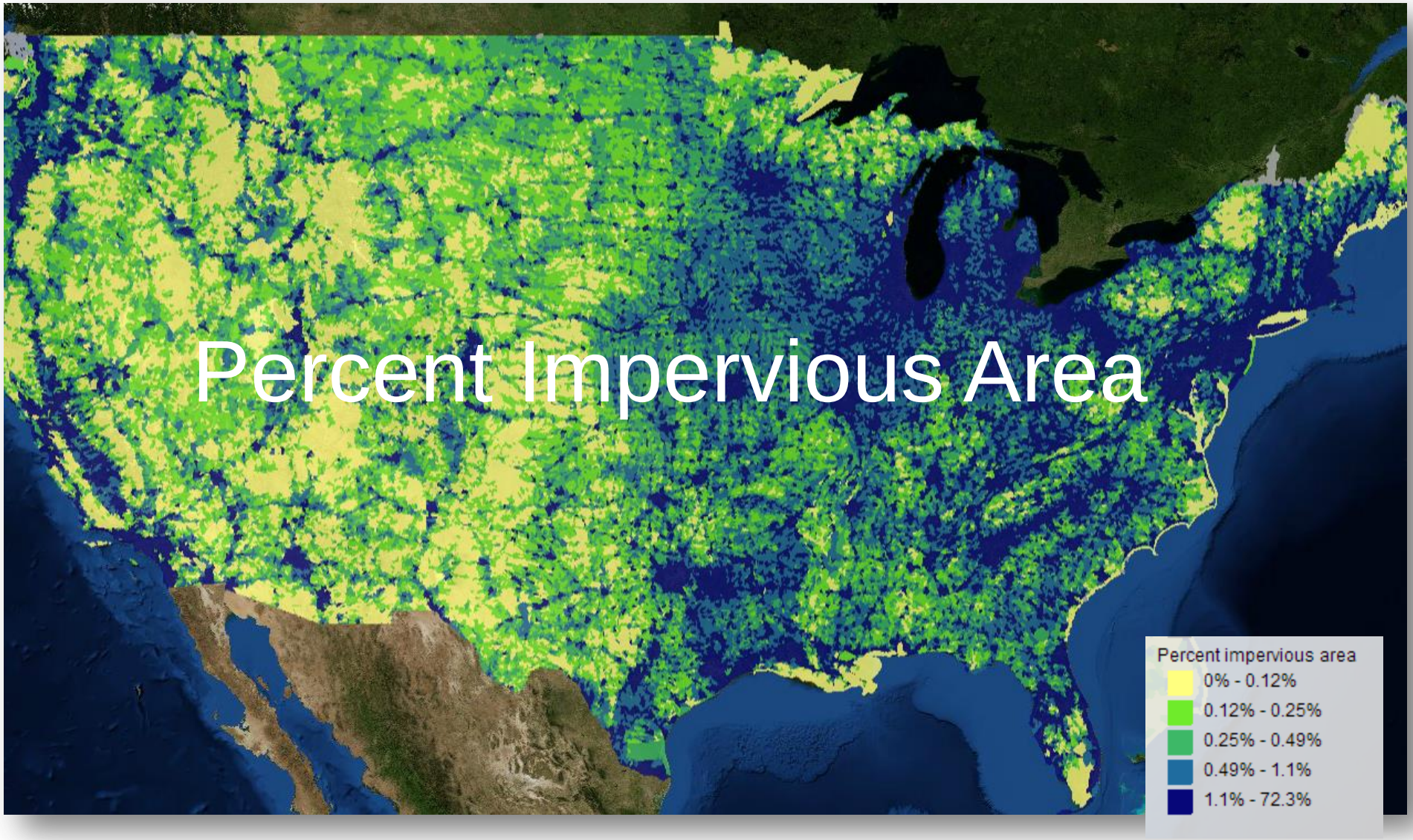
Urban Growth



2010

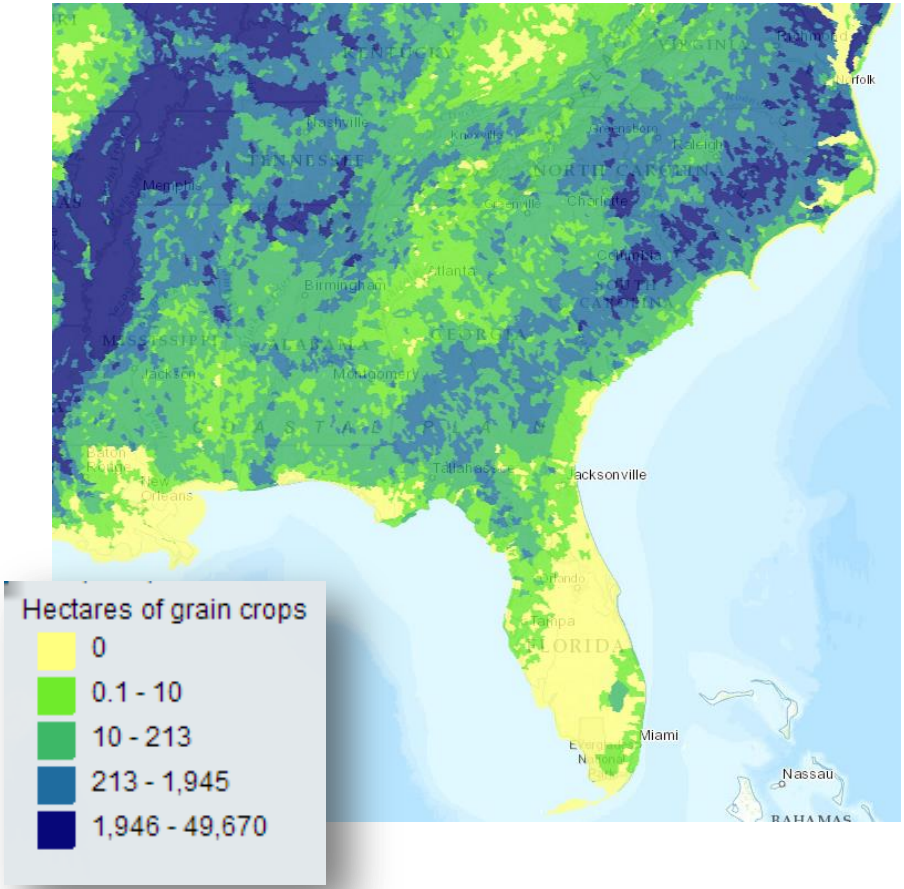
SALCC - SE Regional Assessment Project, SLEUTH Model

Percent Impervious Area

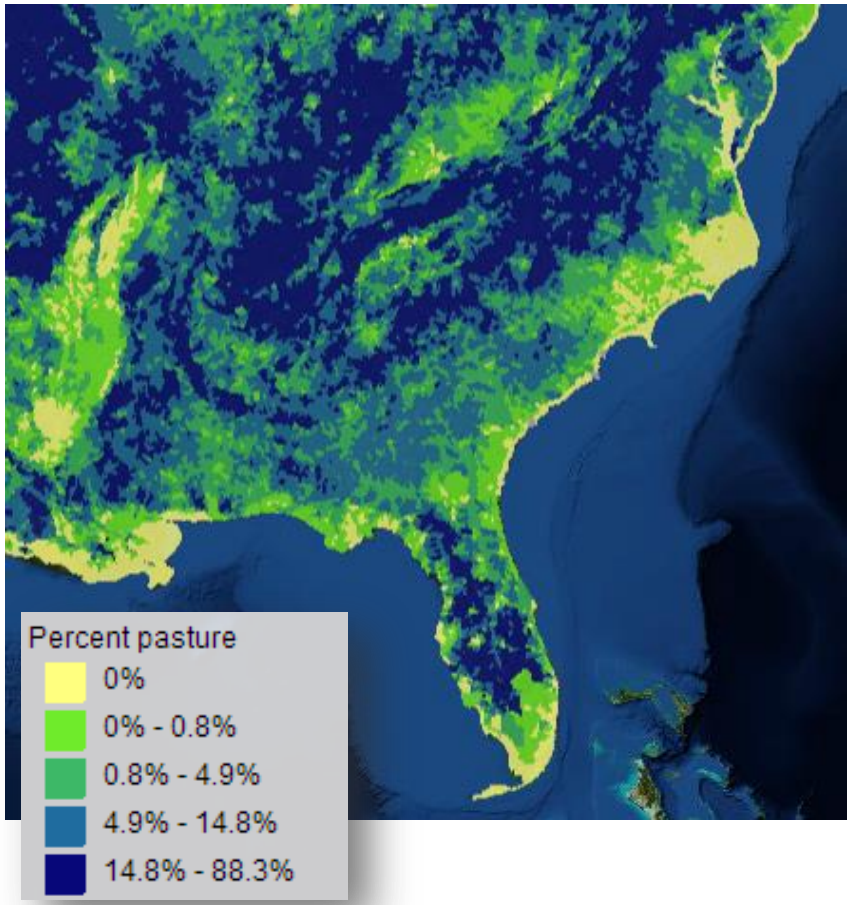


Agriculture

Hectares of Grain Crops

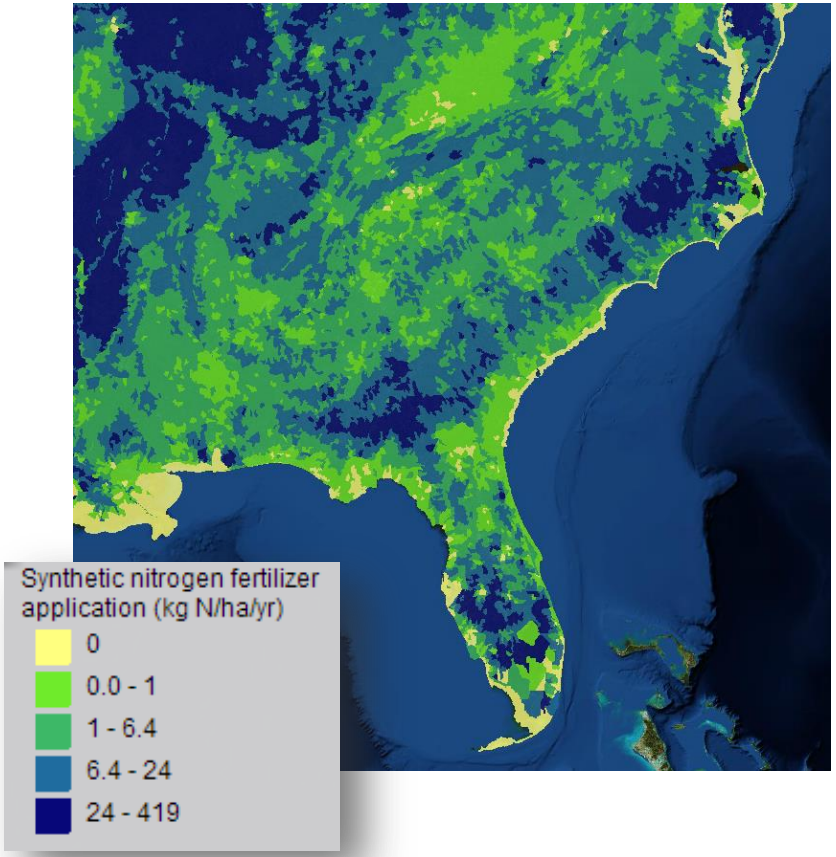


Percent Pasture

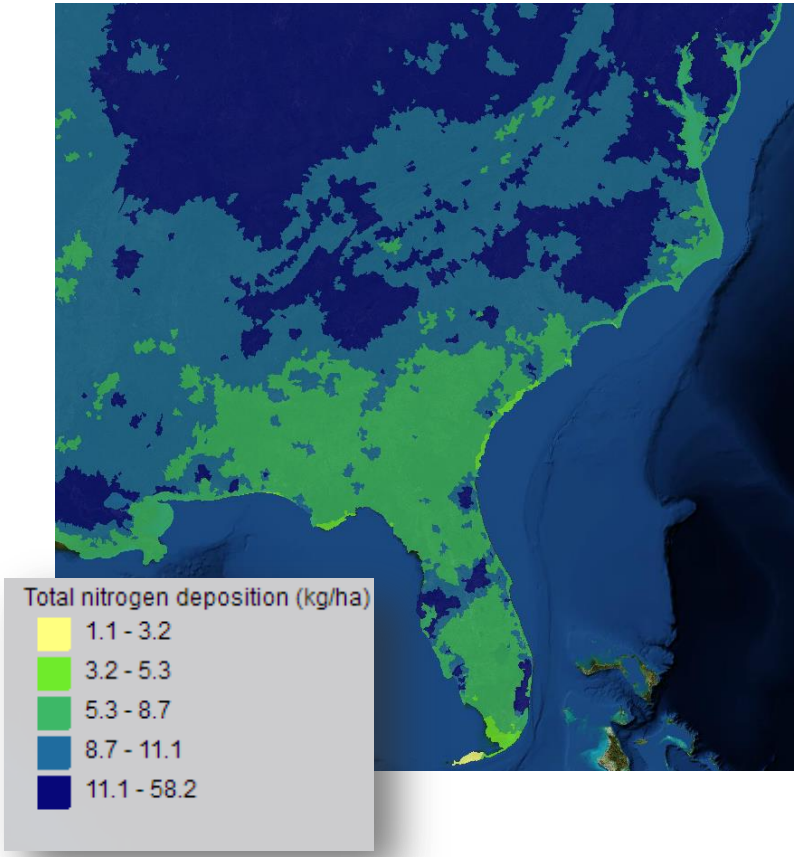


Water Quality

Synthetic Nitrogen Fertilizer Application



Total Atmospheric Nitrogen Deposition

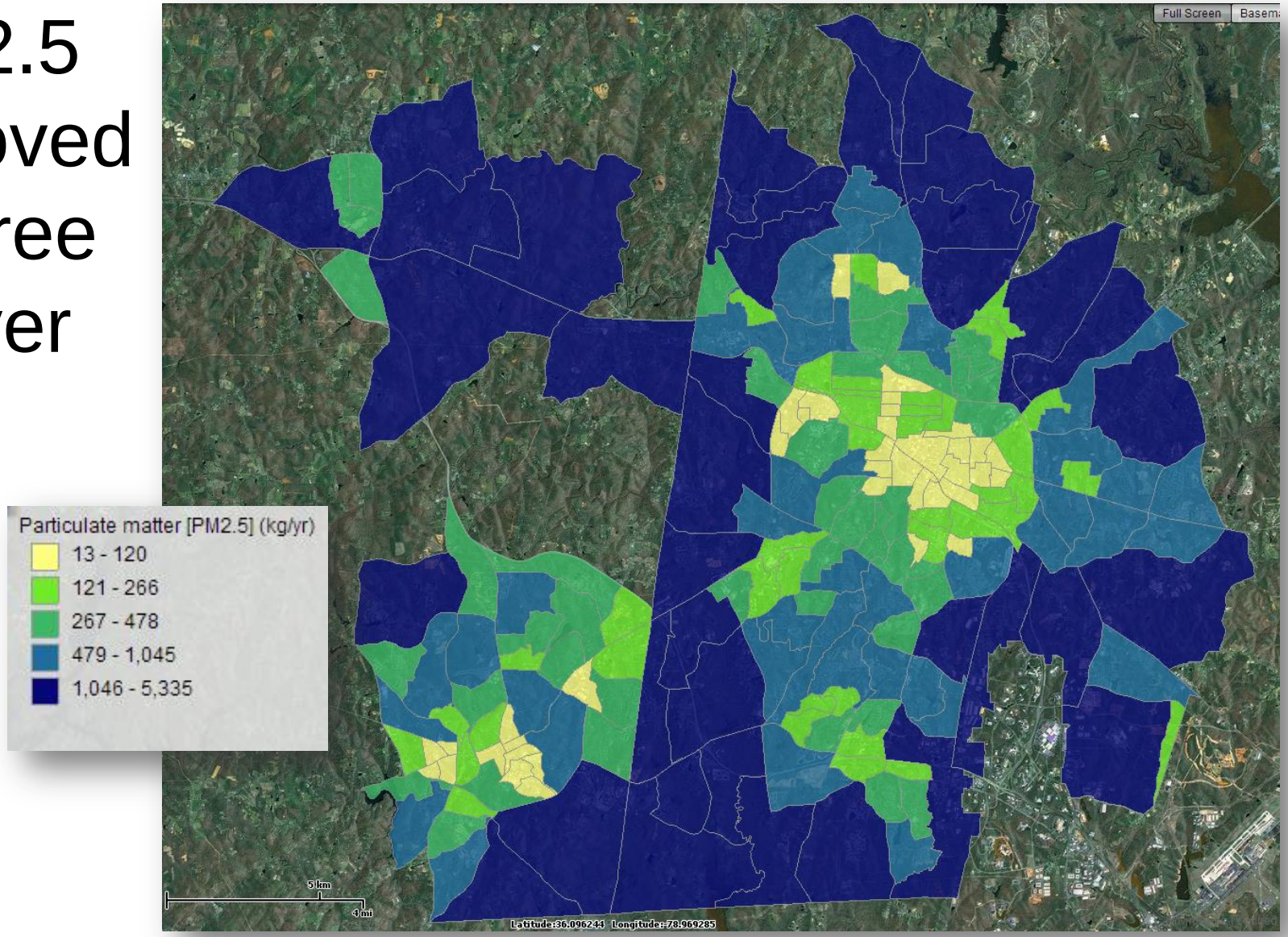


Air Quality

- Travel in the Southeast accounts for 21% of the nation's total vehicle miles traveled
- More than 20 million people in the Southeast are affected by air quality nonattainment for ozone and PM2.5 standards

- Air pollution contributes to health issues like asthma, COPD, and other illnesses
- Air pollutants (e.g., ground level ozone, nitrogen, sulfur) damage vegetation

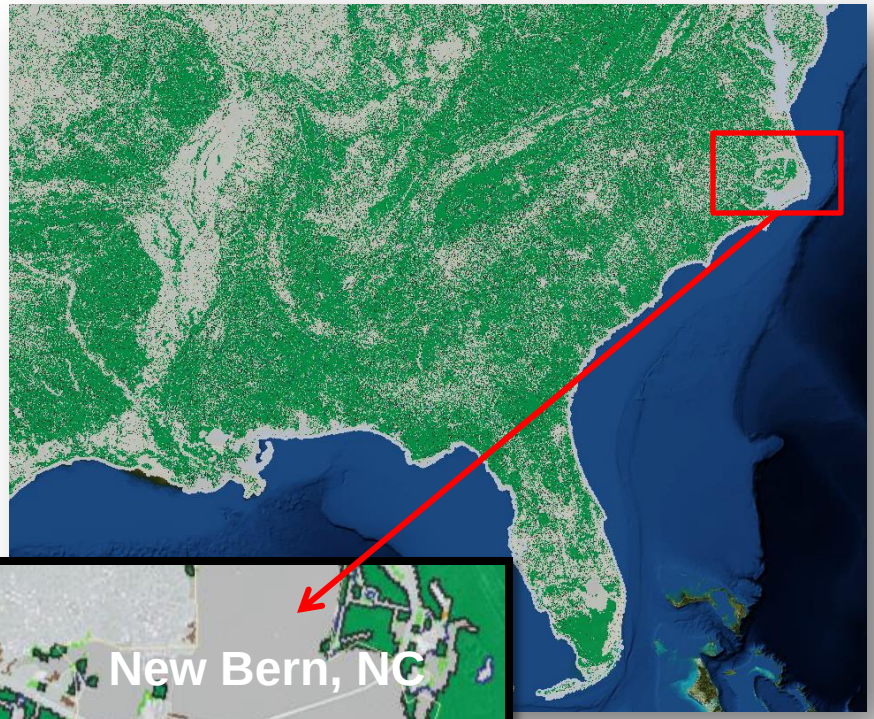
PM2.5 Removed by Tree Cover

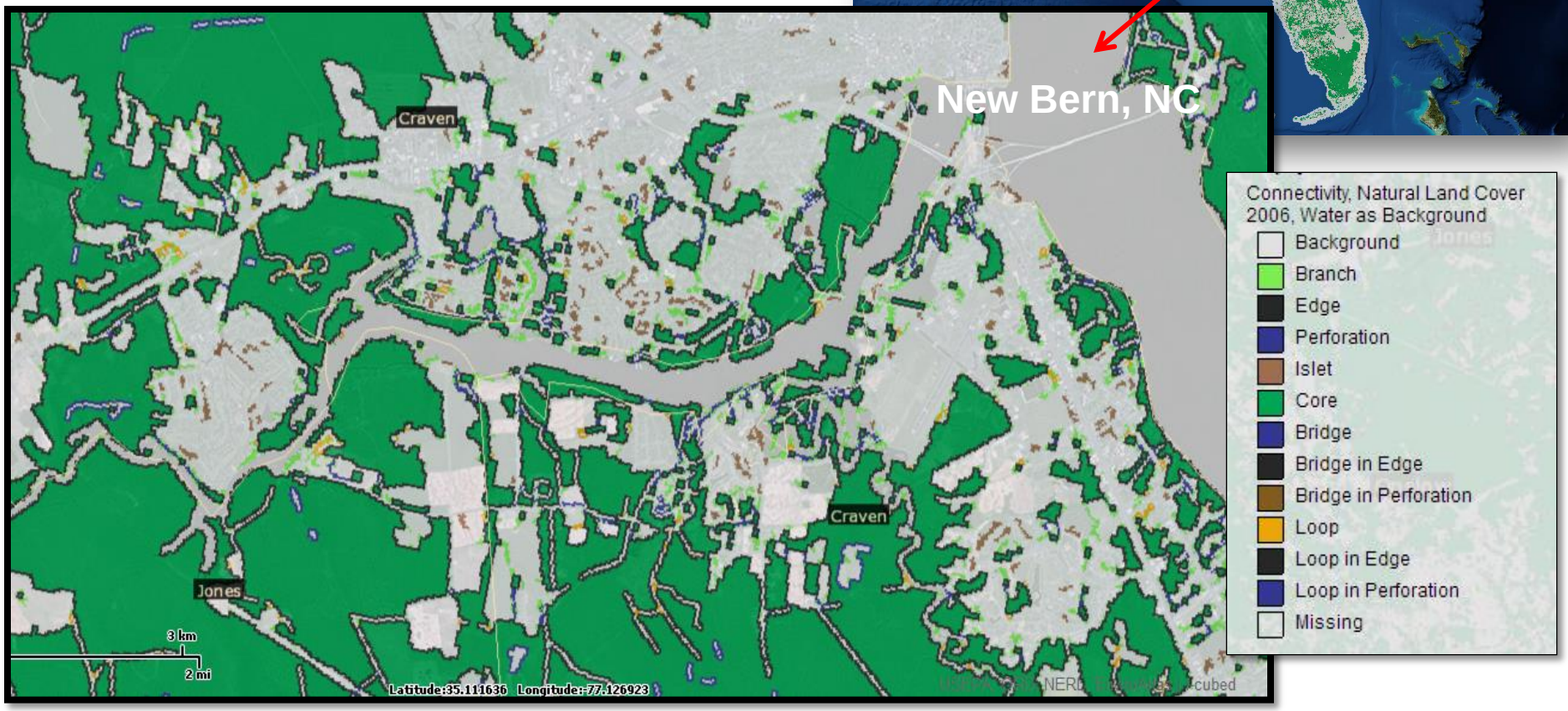


Land Conversion & Fragmentation

- 2,450 acres of open space are lost in the US every day (USFS)
- Impacts on species and diversity
  - Habitat loss
  - Degraded habitats, invasive species
- Wildfire
- Effects on water quality, water flow, air quality

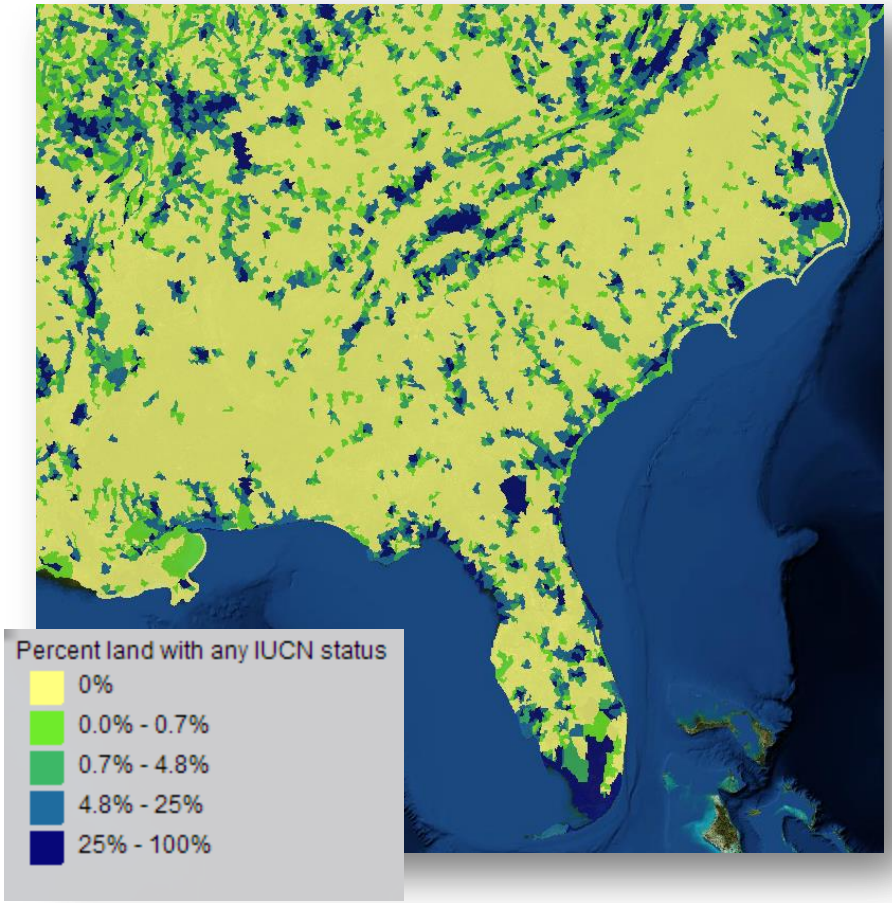
Connectivity & Fragmentation



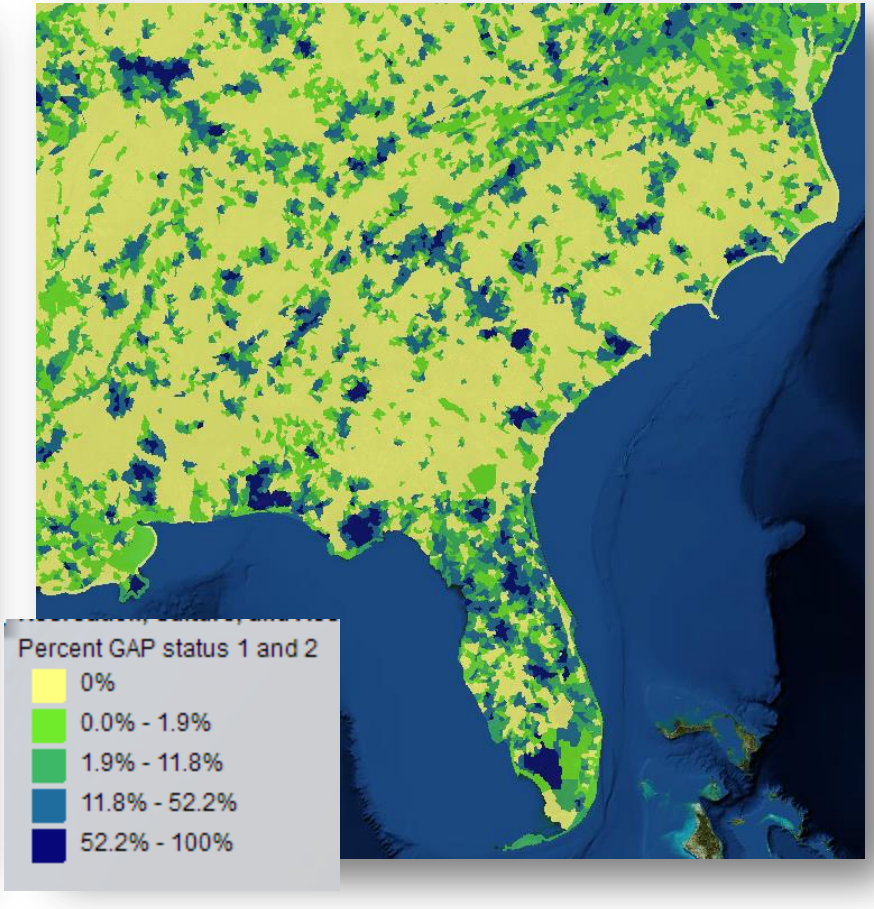


Protected Lands

Percent land with any IUCN Status



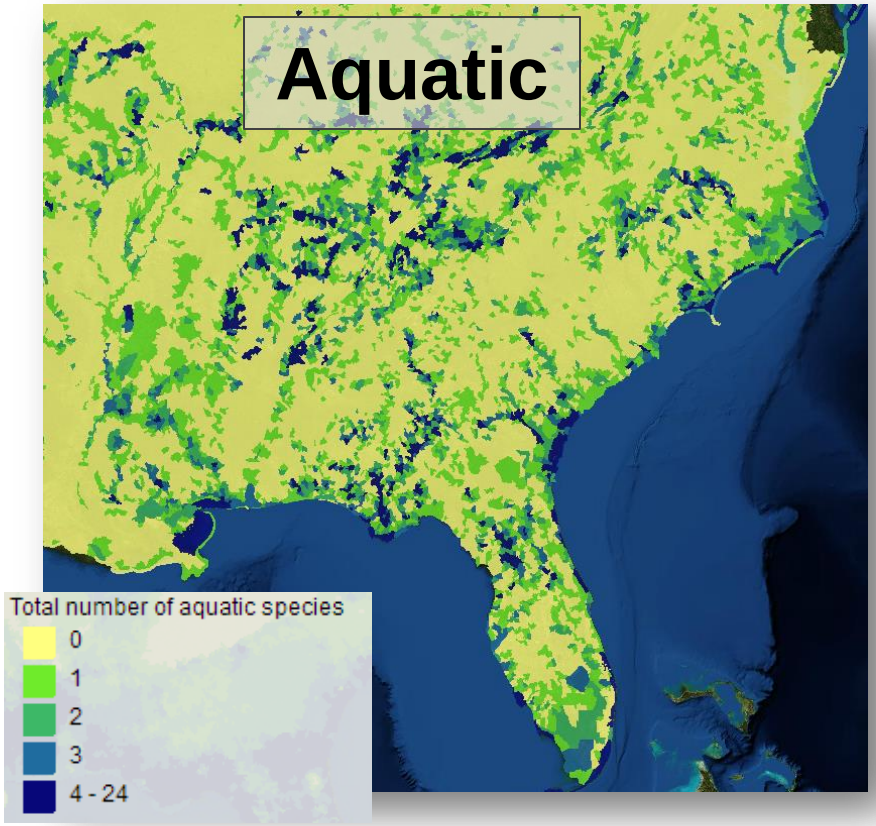
Percent GAP status 1 & 2

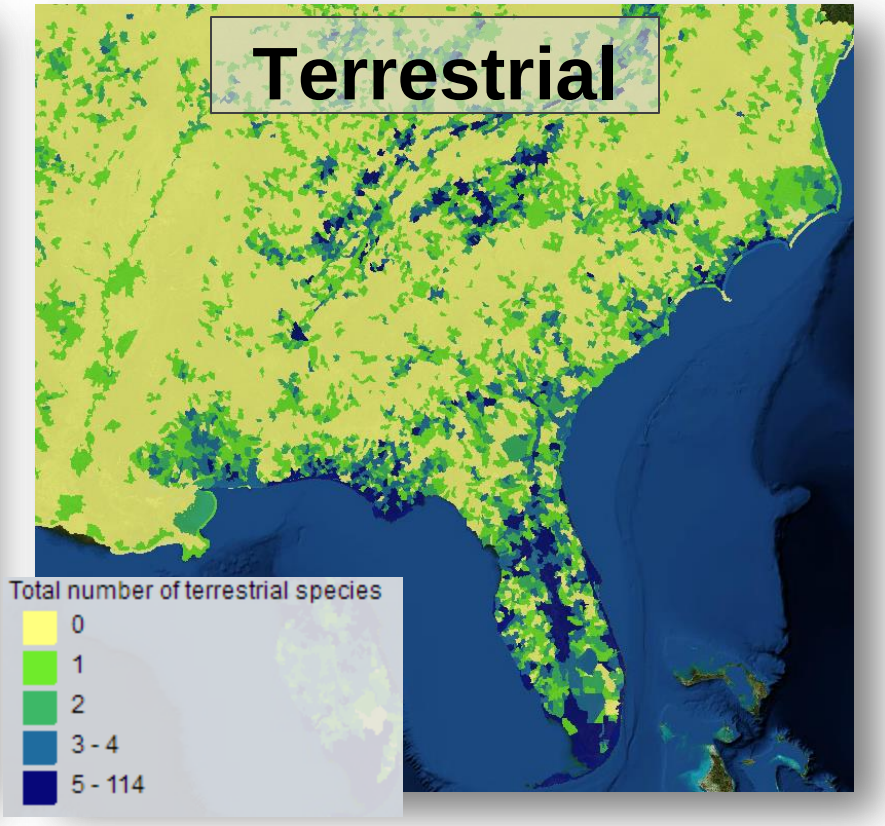


Biodiversity

Over the next 25 years, development will continue to increase and threaten many species, including those that are imperiled

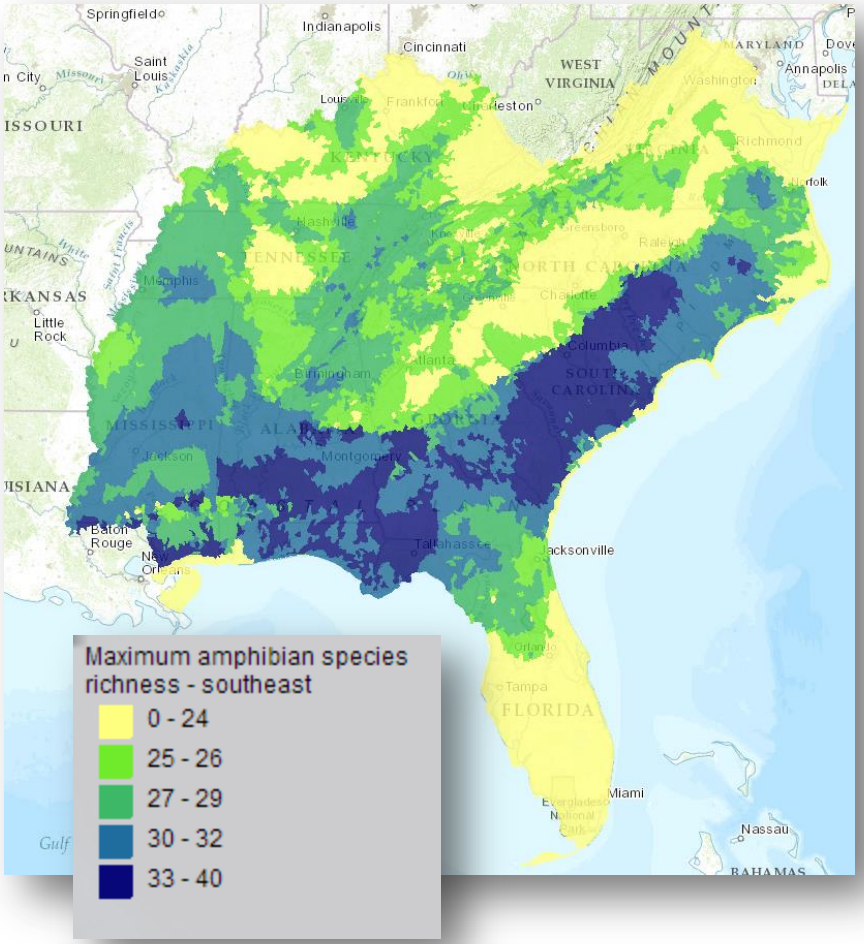
- Miami – Fort Lauderdale, FL – to lose 60% of remaining natural land, home to 68 imperiled species (Ewing and Kostyack 2005)
- Charlotte, NC – to lose 35% of remaining natural land, home to 13 imperiled species



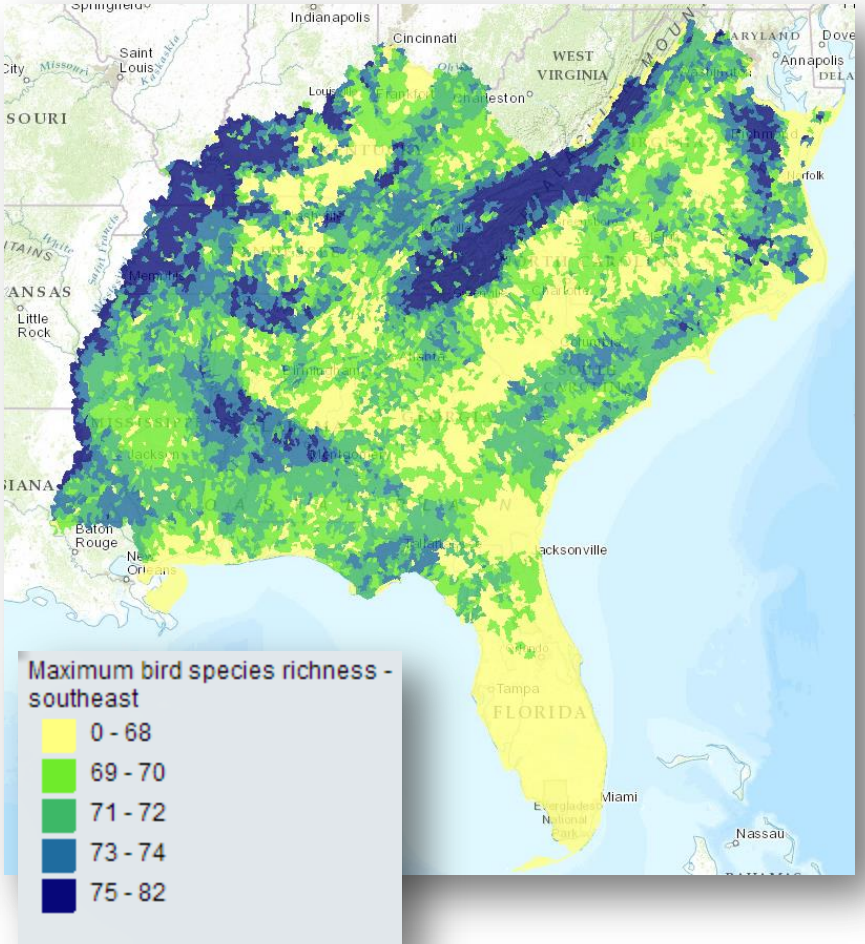


Species Richness

Max Amphibian



Max Bird



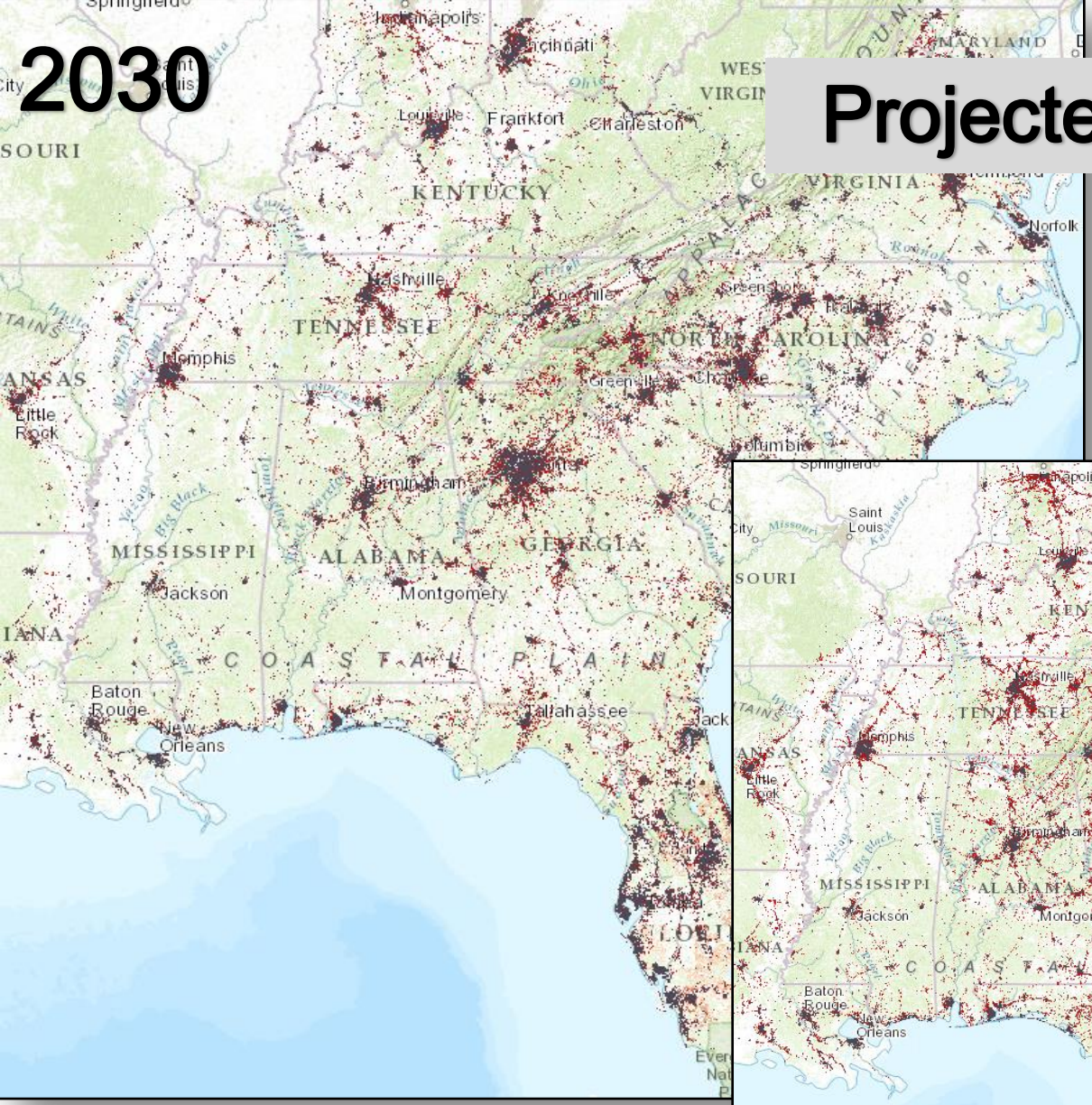
Climate Change

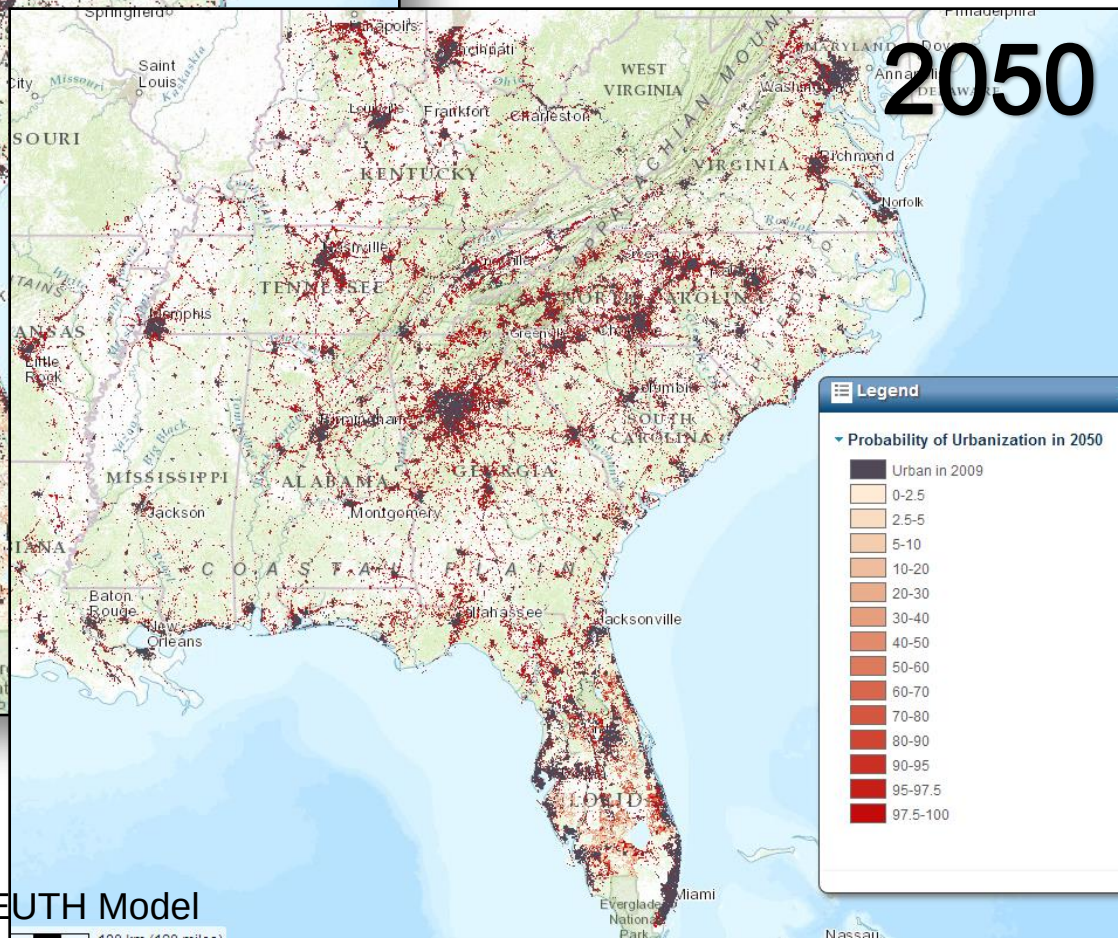
Potential Impacts:

- Avg annual temperature (4 to 9° ↑ by 2080)
- Flooding, drought (~13% ↑ since 1970)
- Human health
- Ecosystem health
- Storm severity and frequency
- Water resources

US Global Change Research Program. Global Climate Change Impacts in the United States – Southeast. 2009 Report.

Projected Urban Growth





SALCC - SE Regional Assessment Project, SLEUTH Model

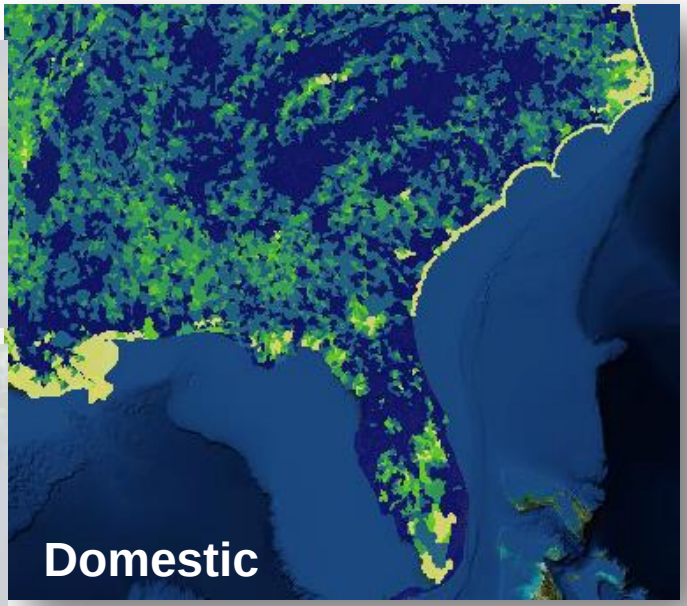
Water Demand

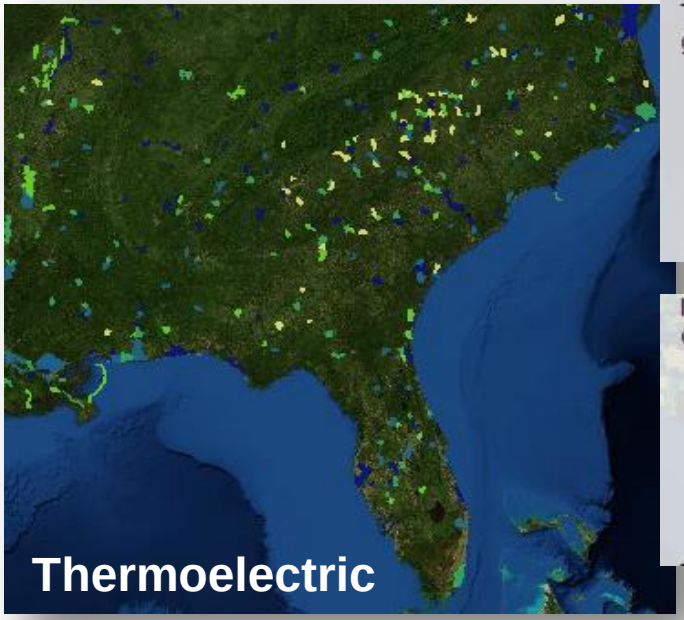
Agricultural water use (million gallons/day)

- 0
- 0.0 - 0.03
- 0.03 - 0.23
- 0.23 - 1.52
- 1.52 - 453.53

Domestic water use (million gallons/day)

- 0.0000 - 0.0006
- 0.0006 - 0.0077
- 0.0077 - 0.0439
- 0.0439 - 0.1740
- 0.1740 - 287.4797



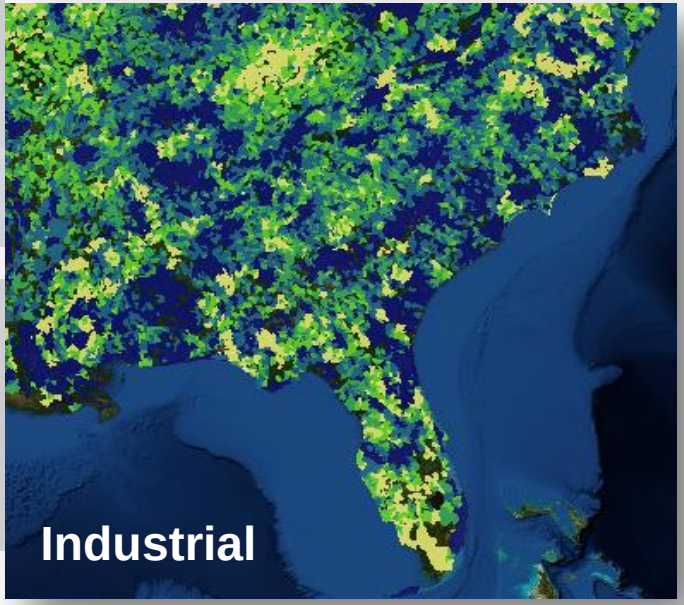


Thermoelectric water use (million gallons/day)

- 0 - 0.035
- 0.035 - 3.747
- 3.757 - 38.08
- 38.1 - 362.2
- 362.3 - 12,464

Industrial water use (million gallons/day)

- 0.000 - 0.004
- 0.004 - 0.016
- 0.016 - 0.051
- 0.051 - 0.195
- 0.195 - 425.228



Thank You

Jessica Daniel
Daniel.Jessica@epa.gov
919-541-1189

Anne Neale
Neale.Anne@epa.gov
919-541-3832

Access the website

http://enviroatlas.epa.gov/enviroatlas

User id: EnviroAtlas Password:ESD132

EnviroAtlas Team

EPA folks including: Annie Neale, Laura Jackson, Megan Mehaffey, Rosie Moore, Tim Wade, Michele Conlon, Yongping Yuan, Drew Pilant, Bill Kepner, Donna Schwede, Ellen Cooter, Robin Dennis, James Wickham, Jay Christensen, Taylor Jarnagin, Don Ebert, Betsy Smith, John liames, Keith Endres, Marc Russell & many more…

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USFS: Dave Nowak, Allison Bodine, Alexis Ellis, Eric Greenfield

USGS: Kevin Gergely, Alexa McKerrow, Norman Bliss (USGS contractor)

NRCS: Sharon Waltman, Dave Hoover

NASS: Rich Iovanna

New Mexico State University: Ken Boykin and graduate students

NatureServe: Kyle Copas, Lori Scott, Whitney Weber

National Geographic: Frank Biasi

Innovate! Inc.: Barbara Rosenbaum and Suzanne Pierson

OTIE: David Eskew, Don Catanzaro, Katie Conlon

RTI: Bill Wheaton, Jay Rineer

Tetra-Tech: Michael Paul, Peter Cada