Draft

EnviroAtlas Slides

(Title Page contains current presentation information)

These slides have been previously approved

(See ORD-009174)

SUSTAINABLE & HEALTHY COMMUNITIES RESEARCH PROGRAM

EnviroAtlas

A Spatially Explicit Tool Combining Climate Change Scenarios with Ecosystem Services Indiattors

Anne Neale

2014 AGU Meeting, San Francisco CA

December 15 – December 19, 2014

EnviroAtlas is an interactive web-based tool that states, communities, and citizens can use to help inform policy and planning decisions that impact the places where people live, learn, work and play.

The tool allows users to view, analyze, and download information related to ecosystem goods and services (nature's benefits) for the United States.

"Ecosystem goods and services" refers to all the benefits derived by people from nature. They include direct benefits (e.g., jobs); as well as indirect benefits (e.g., purification of water by vegetation).

What is EnviroAtlas?

EnviroAtlas includes:

- Geospatial indicators and indices of the supply, demand, and benefits/beneficiaries of ecosystem services
- Drivers of change
- Reference data (e.g., boundaries, land cover, soils, hydrography, impaired water bodies, wetlands, demographics, community design)
- Analytic and interpretive tools

What are Target Outcomes of EnviroAtlas?

1) Boost "Environmental Intelligence"

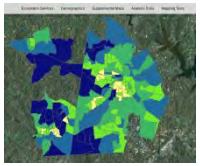
2) Increase Community Empowerment

3) Improve Understanding of Public Health and Well-Being

4) Jumpstart Innovation by Providing Data

Types of Information in EnviroAtlas

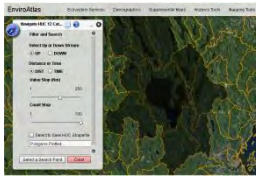
- **Summary maps: census block-group / 12-digit HUC**




- **Pixel-level maps: 1m and 30m resolution**


- **"Heat" maps: landcover density and intensity**


- **Supplemental maps: road and stream networks, etc.**



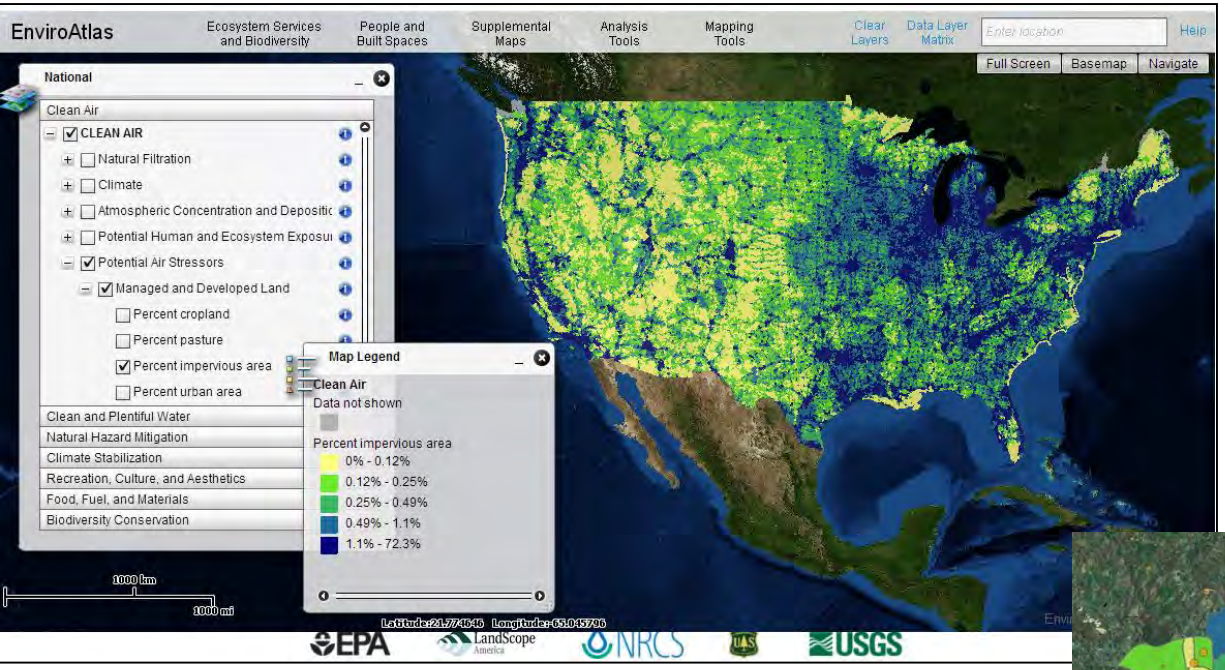

- **Analysis tools**

- **Additional information/ references**

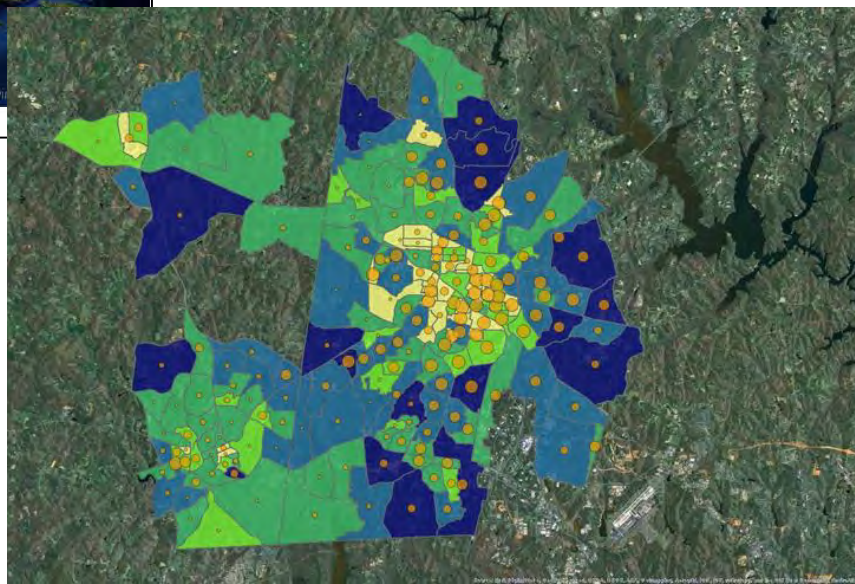

What is General Status of EnviroAtlas?

Number of Data Layers in Each Category	Clean Air	Clean & Plentiful Water	Natural Hazard Mitigation	Climate Stabilization	Recreation, Culture, & Aesthetics	Food, Fuel, & Materials	Biodiversity Conservation	Total
National	21	47	19	12	97	56	100	**161**
Community	31	39	30	19	37	2	26	**94**

The EnviroAtlas is multi-scaled



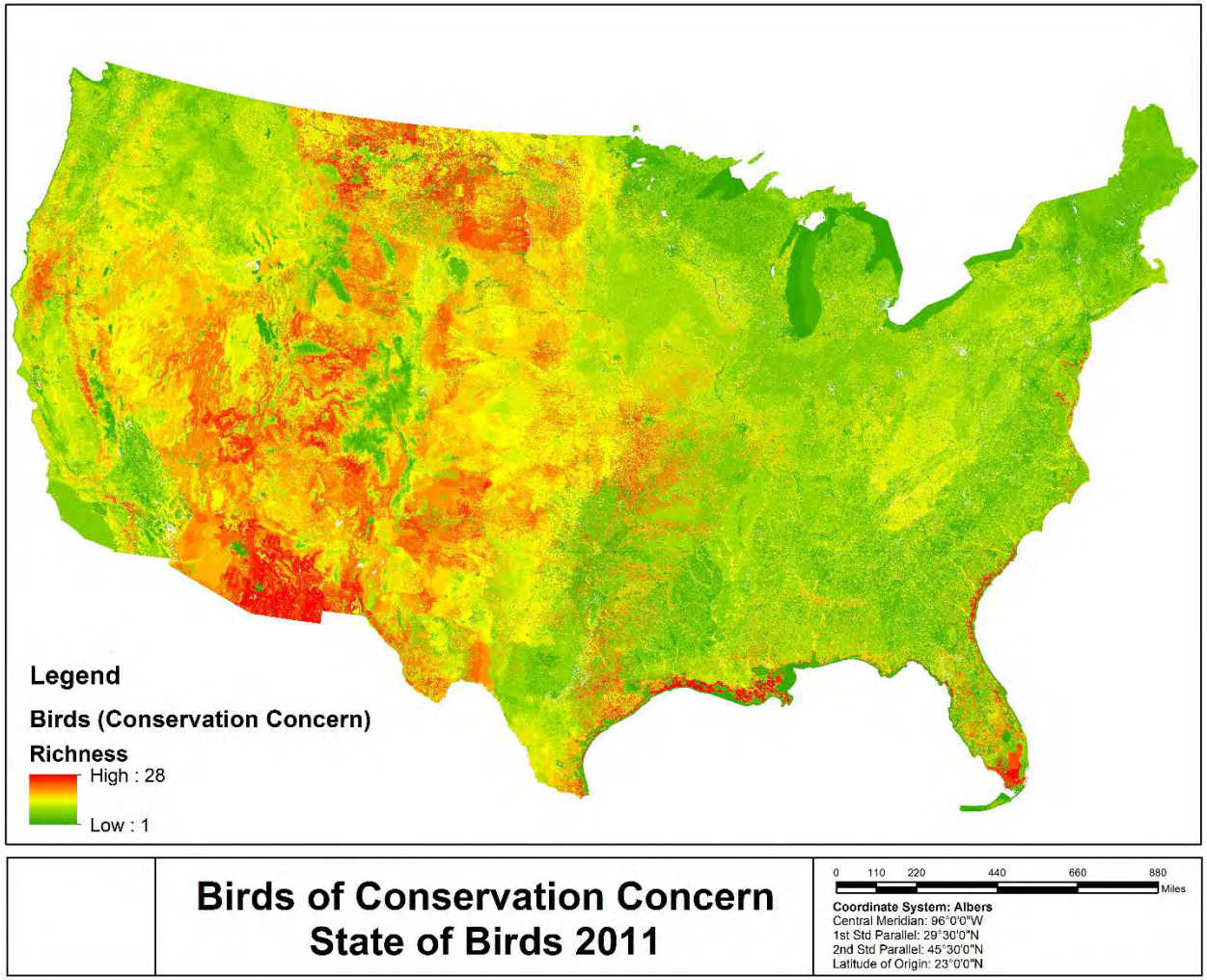
- National: Wall-to-wall coverage for coterminous US; summarized by drainage basins (12-digit HUCs)



- Community: High resolution component for 50 cities, summarized to US Census Blocks.

Example of Benefit Categories:
Biodiversity Conservation

- USGS GAP individual species models
- Brainstorming--USGS, FWS, & EPA
- Developed working indicators
- Multiple stakeholder workshops
- Series of maps for EnviroAtlas

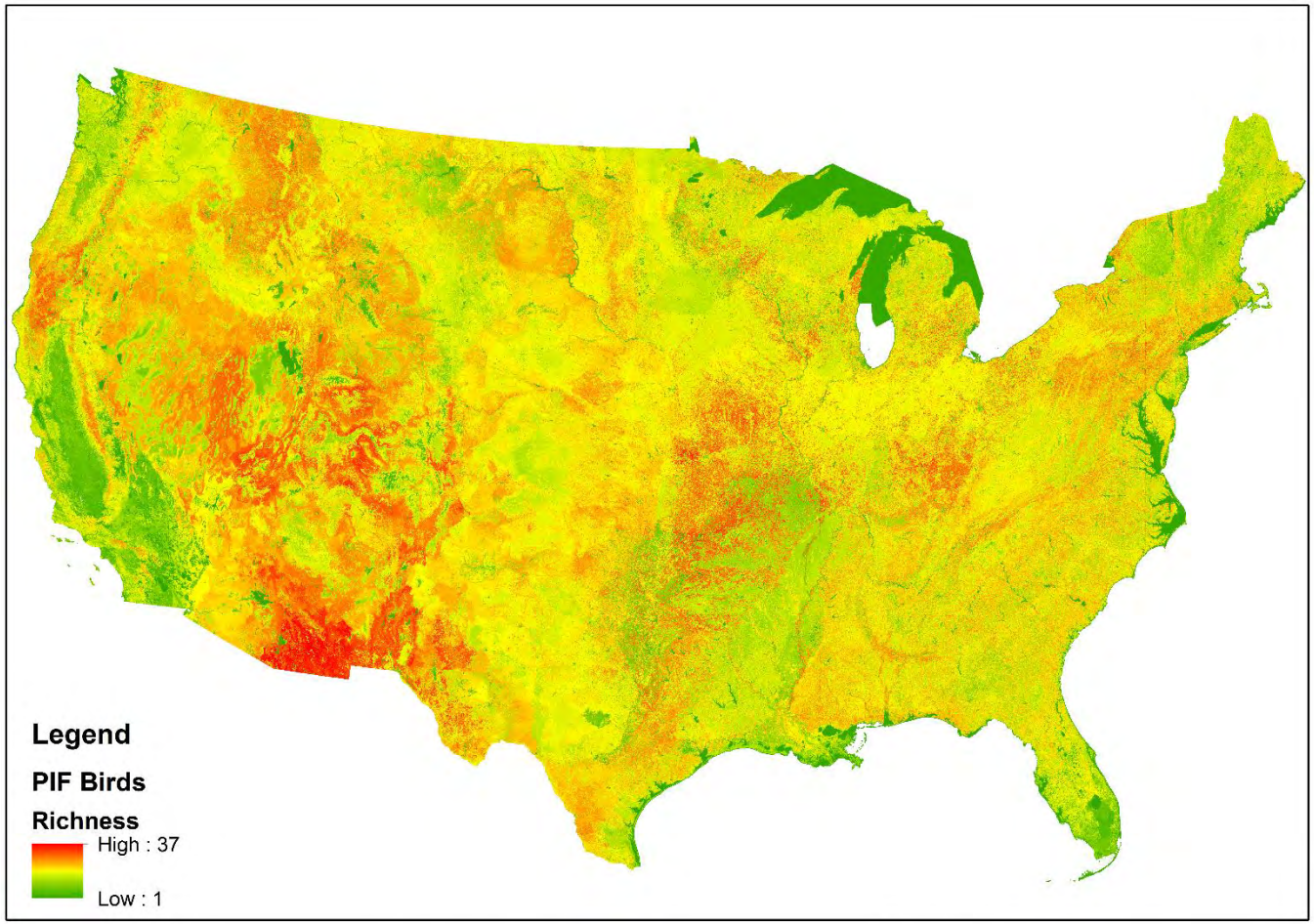


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

USGS science for the changing world

gap KEEPING COMMON SPECIES COMMON

Example Benefit Categories:
Biodiversity Conservation



PIF Species

0 110 220 440 660 880
Miles

Coordinate System: Albers
Central Meridian: 96°0'0"W
1st Std Parallel: 29°30'0"N
2nd Std Parallel: 45°30'0"N
Latitude of Origin: 23°0'0"N

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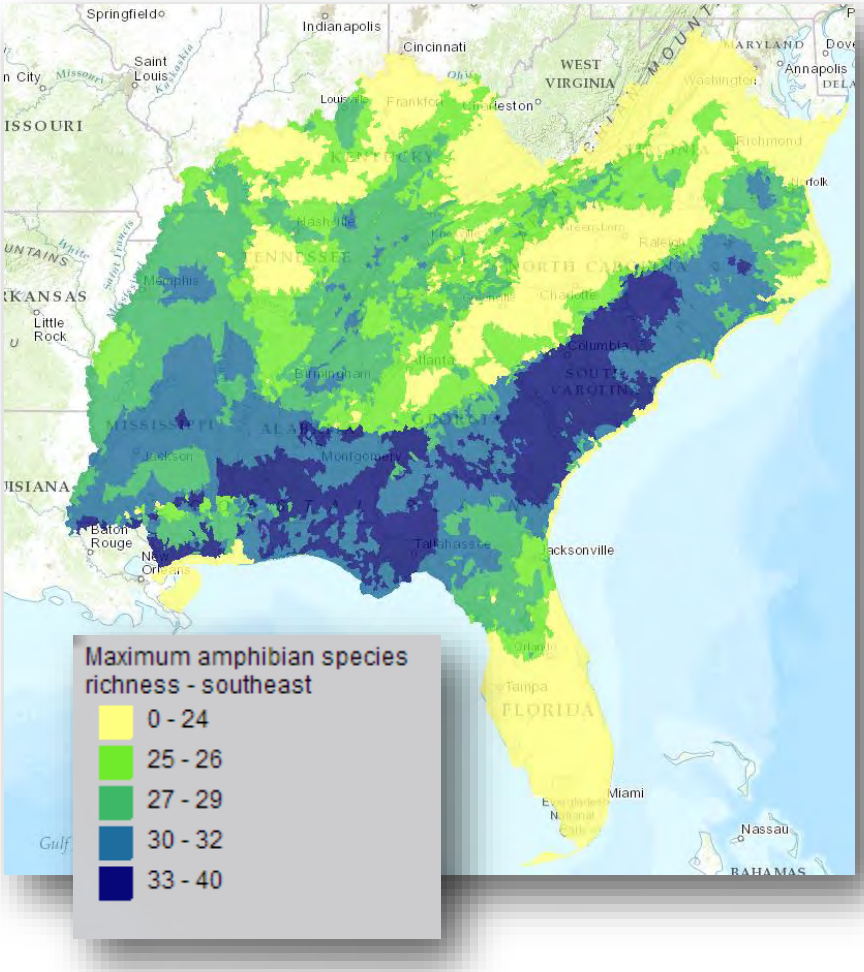
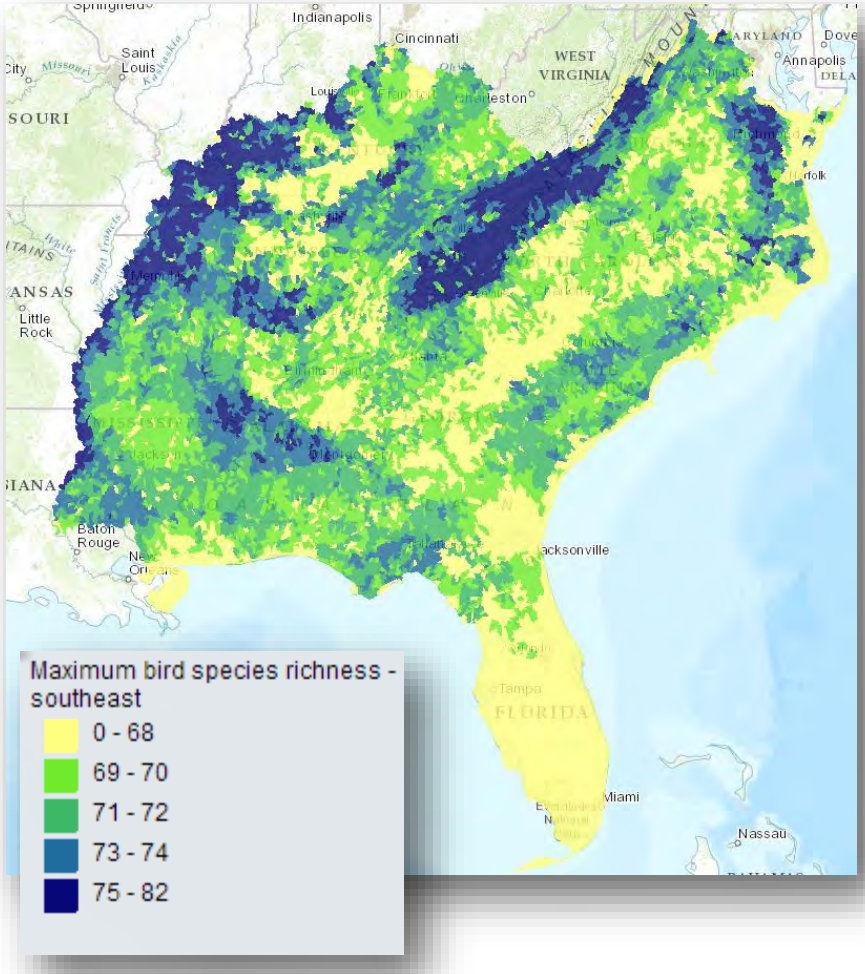
Species Richness

Max Amphibian

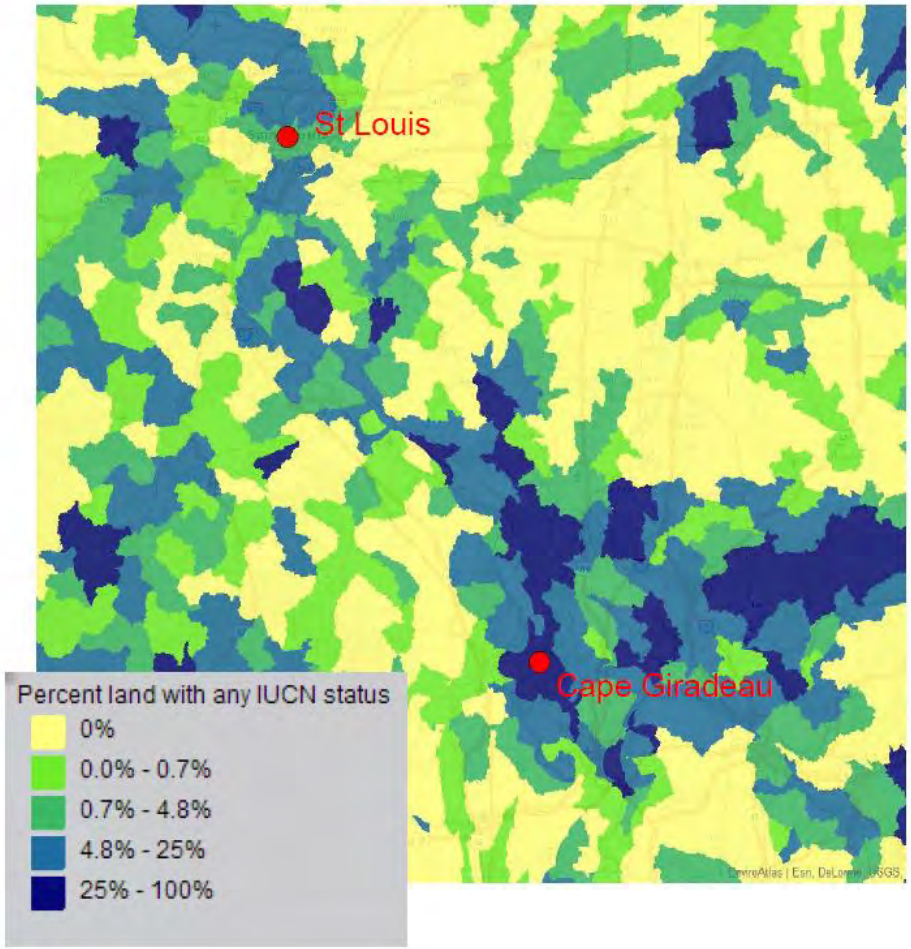


Max Bird

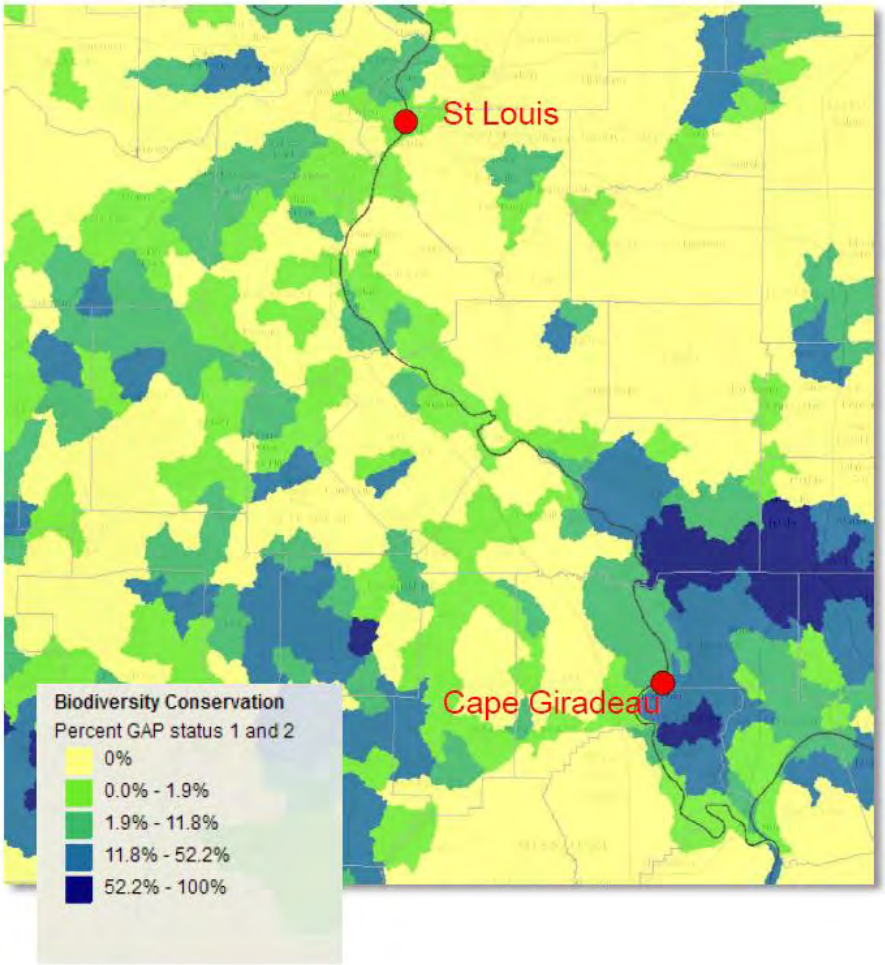


Protected Lands

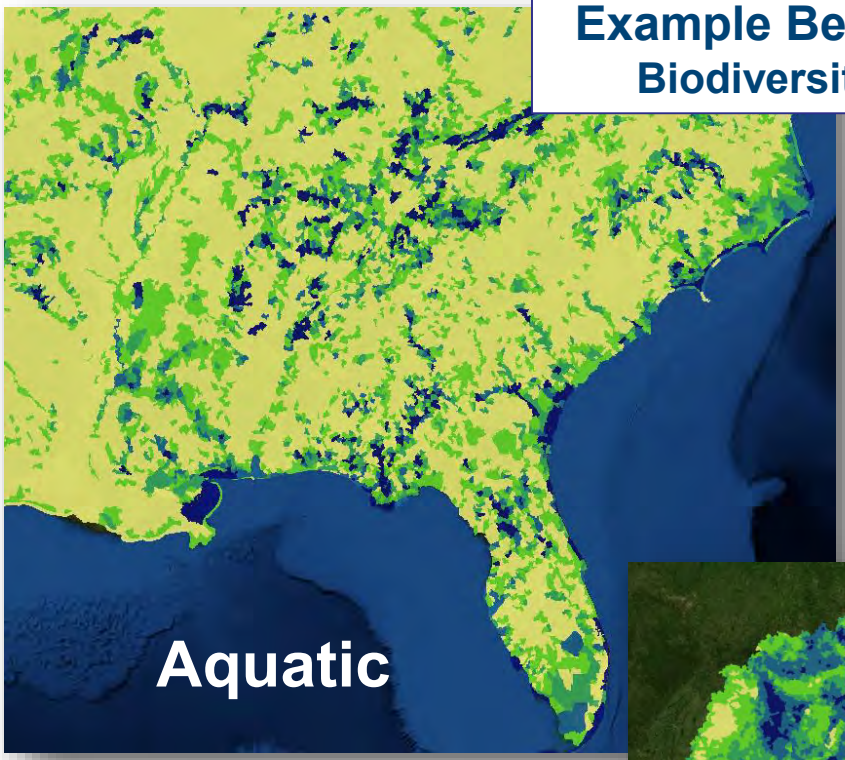
Percent land with any IUCN Status

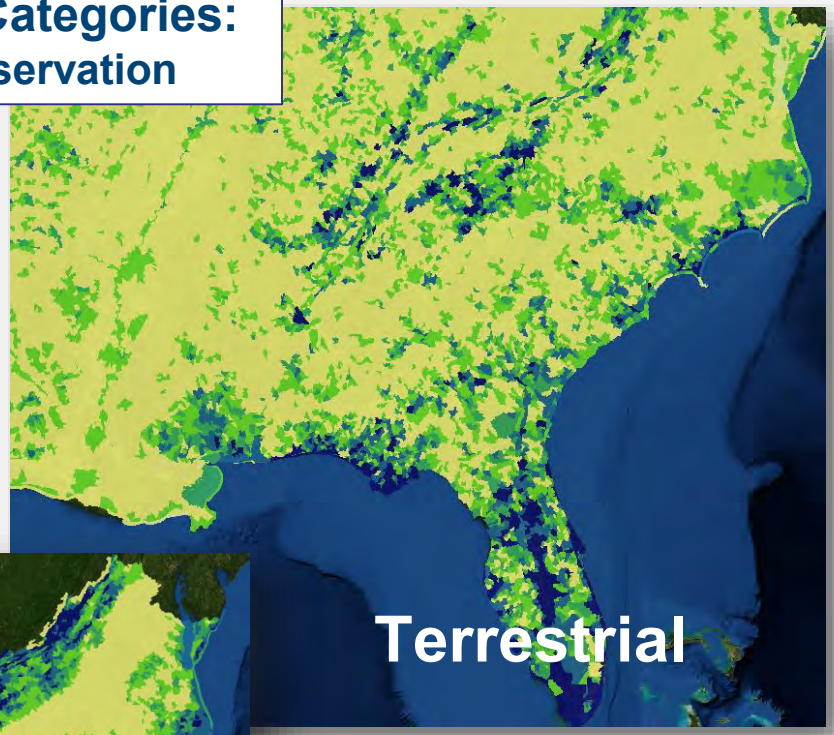


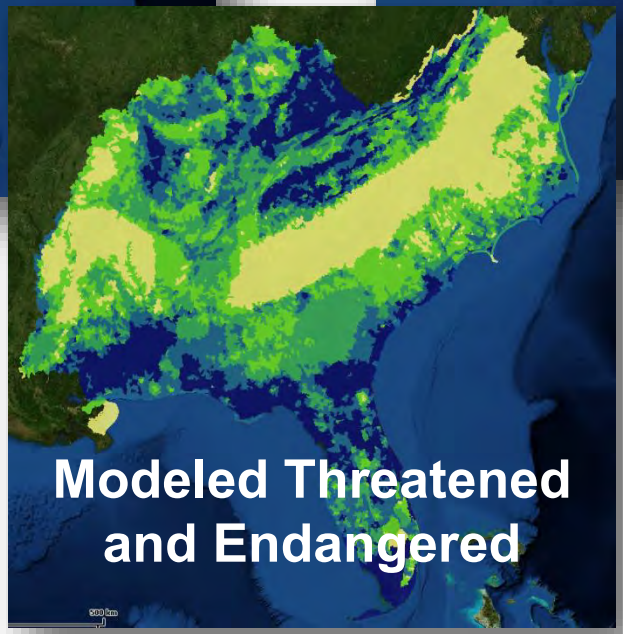
Percent GAP 1 & 2



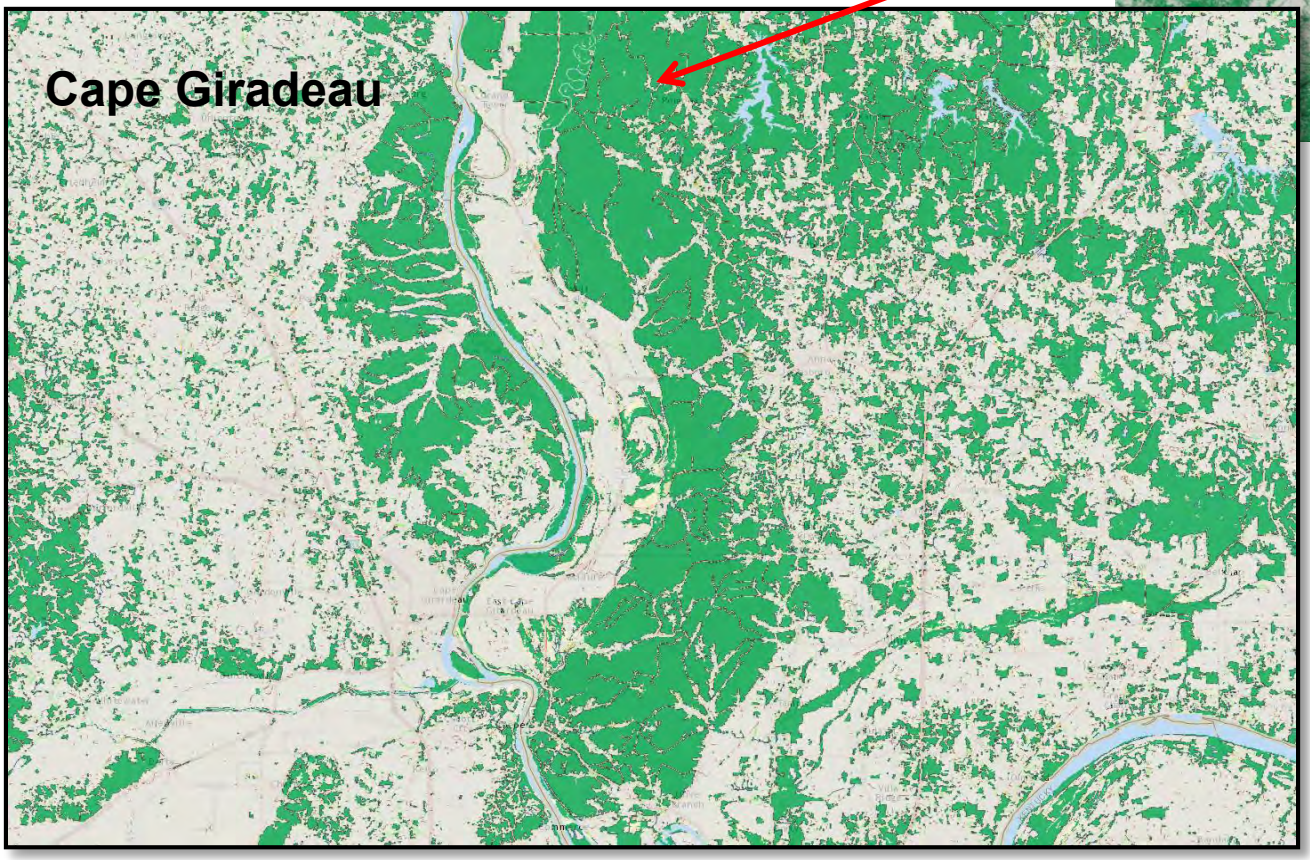
Example Benefit Categories:
Biodiversity Conservation

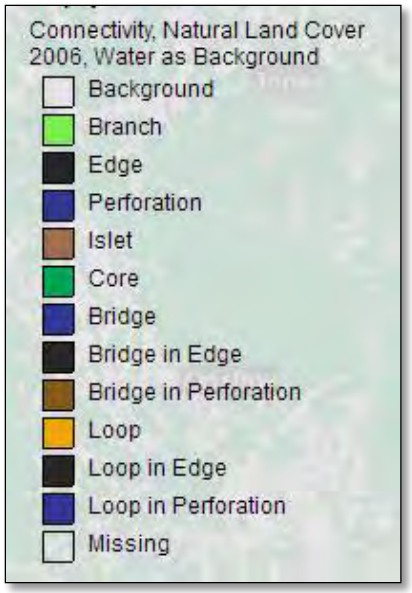




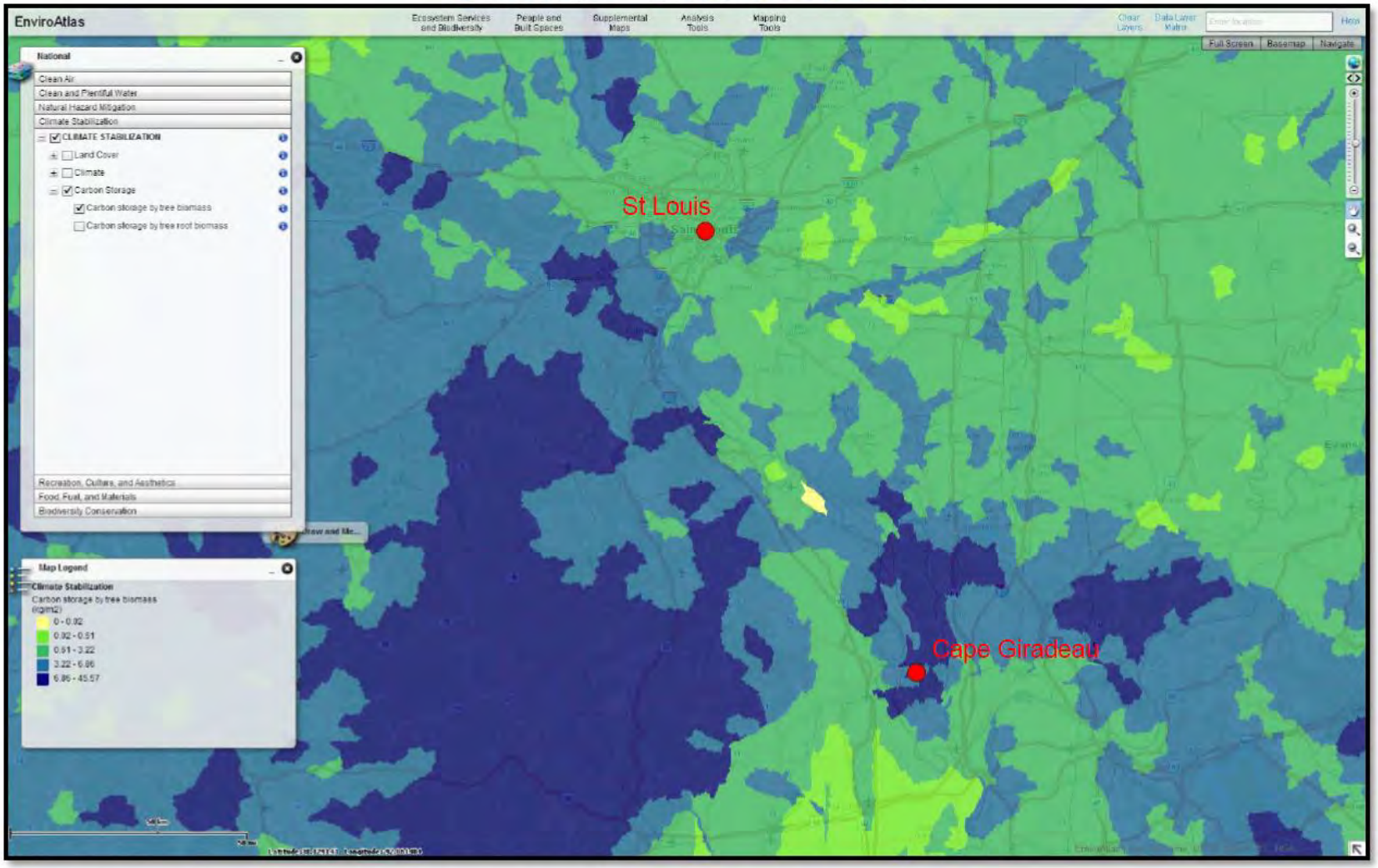


Example Benefit Categories:
Biodiversity Conservation
Landscape fragmentation





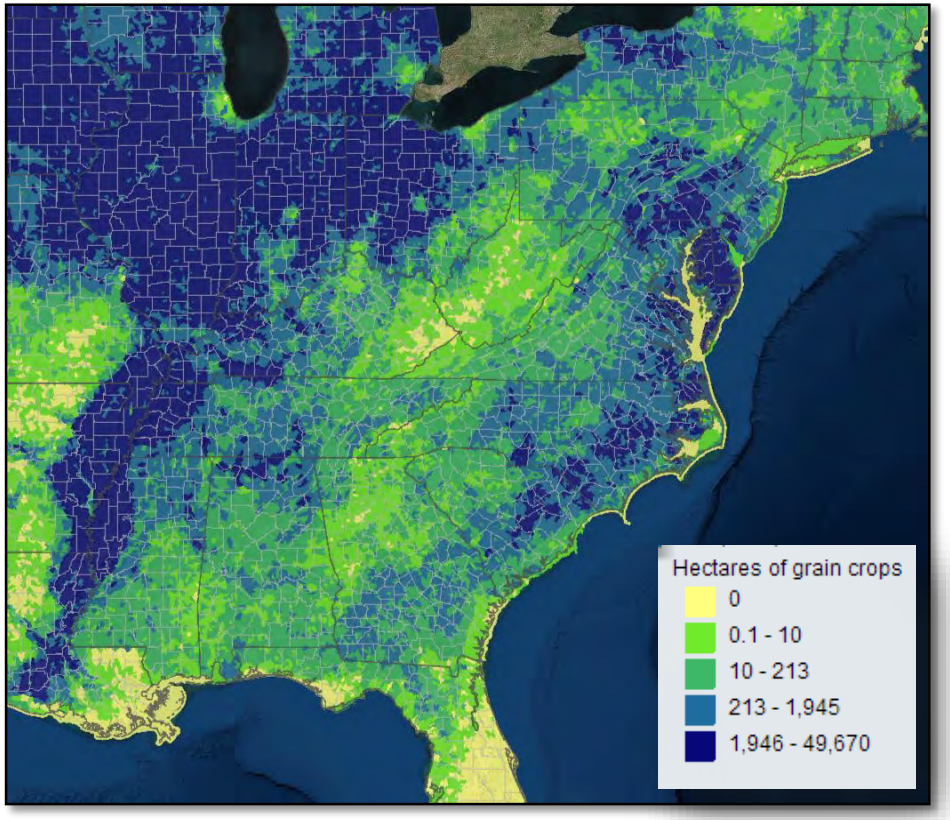
Example Benefit Category:
Climate Stabilization



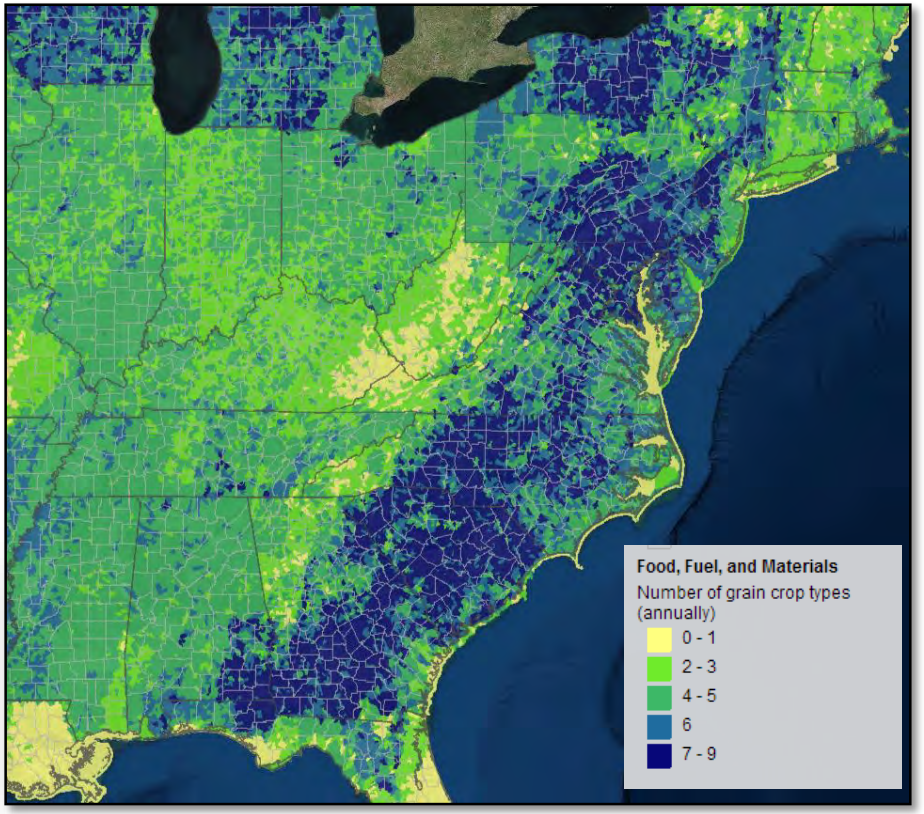
Based on National Biomass and Carbon Dataset 2001 – Woods Hole

Example Benefit Categories:
Food, Fuel, and Materials

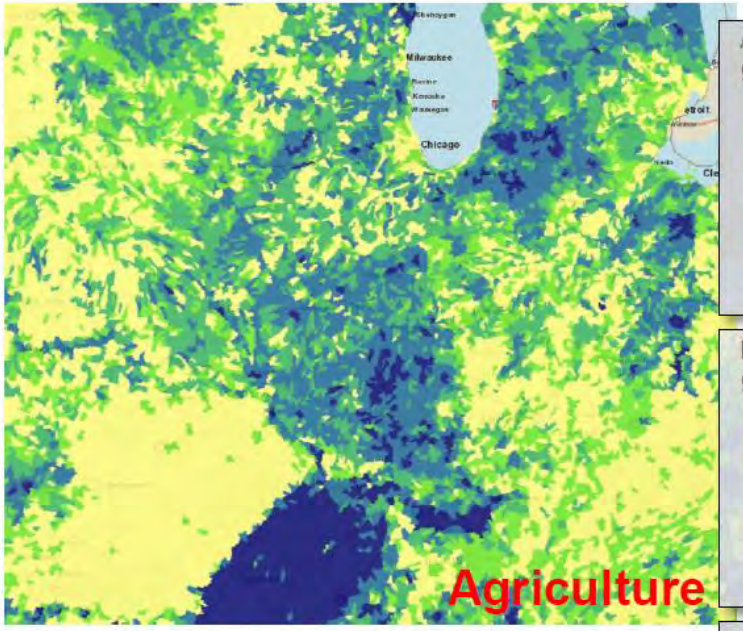
Hectares of Grain Crops



Percent Pasture

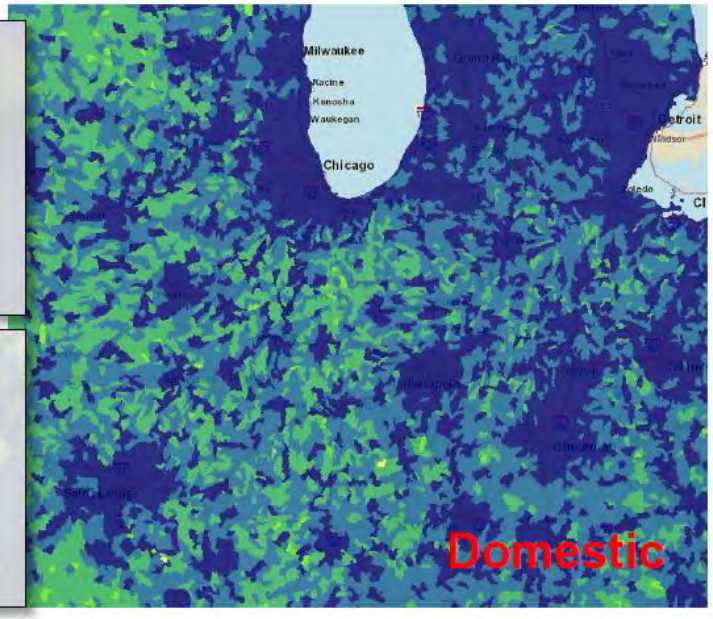


Water Demand

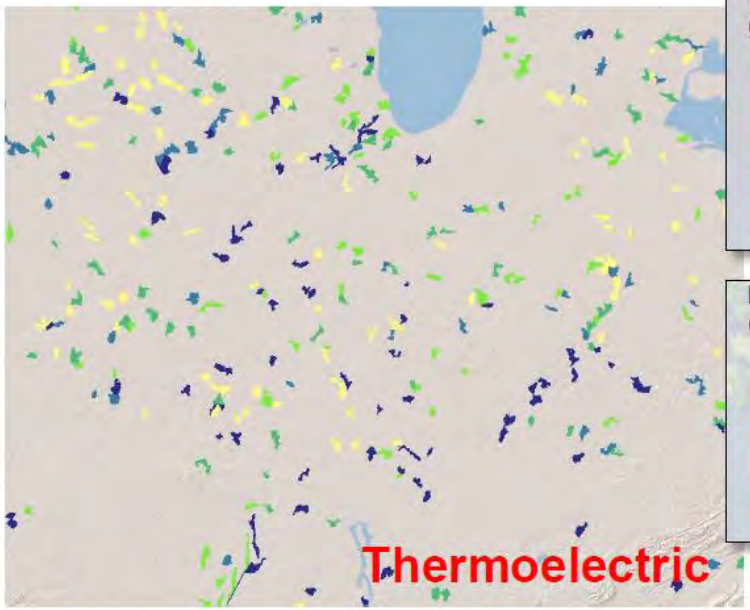


Agricultural water use (million gallons/day)
- 0
- 0.0 - 0.03
- 0.03 - 0.23
- 0.23 - 1.52
- 1.52 - 453.53

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

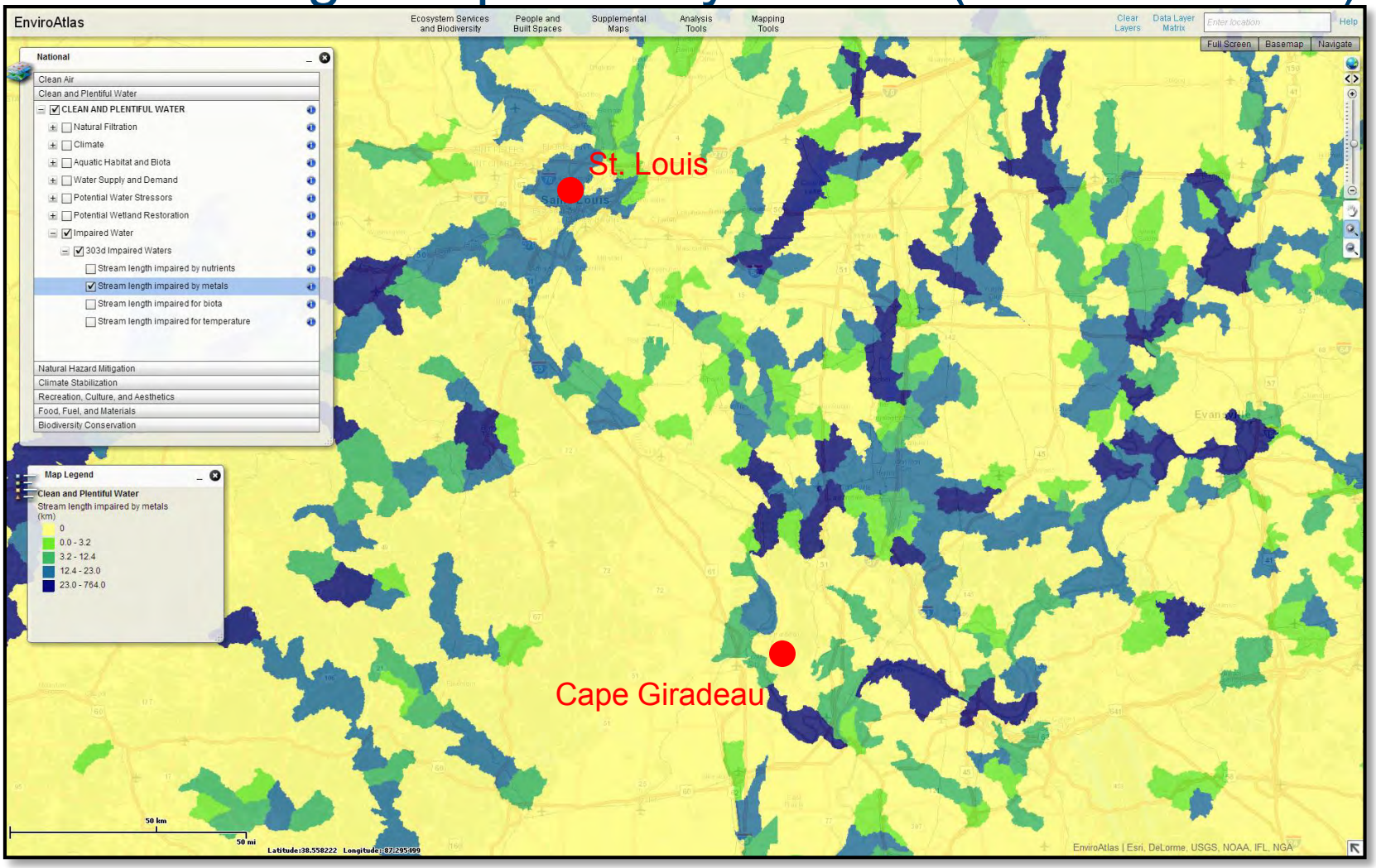


Thermoelectric water use (million gallons/day)
- 0 - 0.035
- 0.035 - 3.747
- 3.757 - 38.08
- 38.1 - 362.2
- 362.3 - 12,464

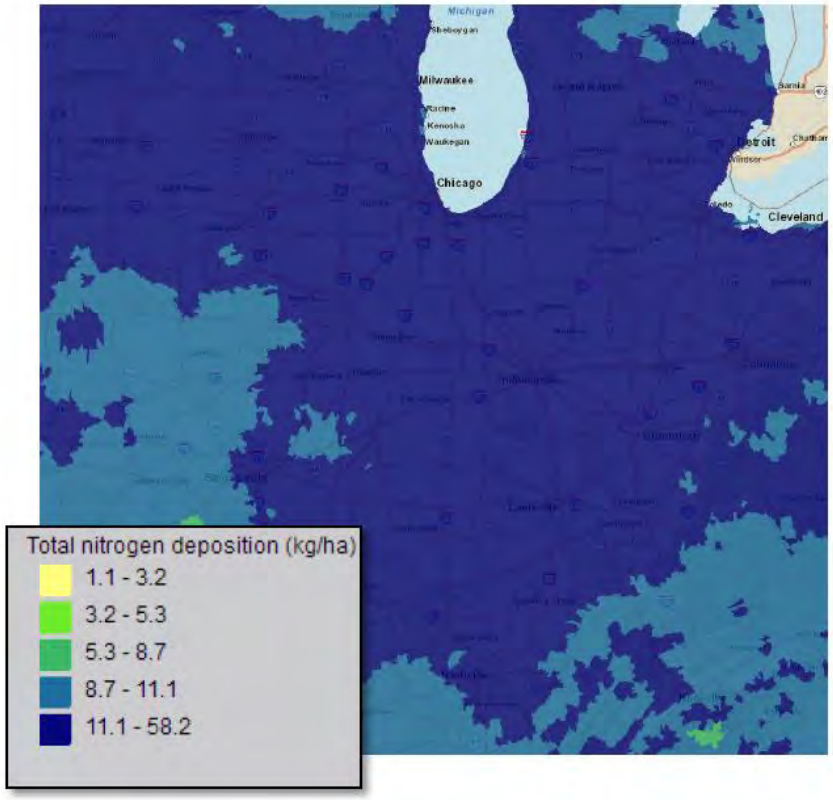


Industrial water use (million gallons/day)
- 0.000 - 0.004
- 0.004 - 0.016
- 0.016 - 0.051
- 0.051 - 0.195
- 0.195 - 425.228

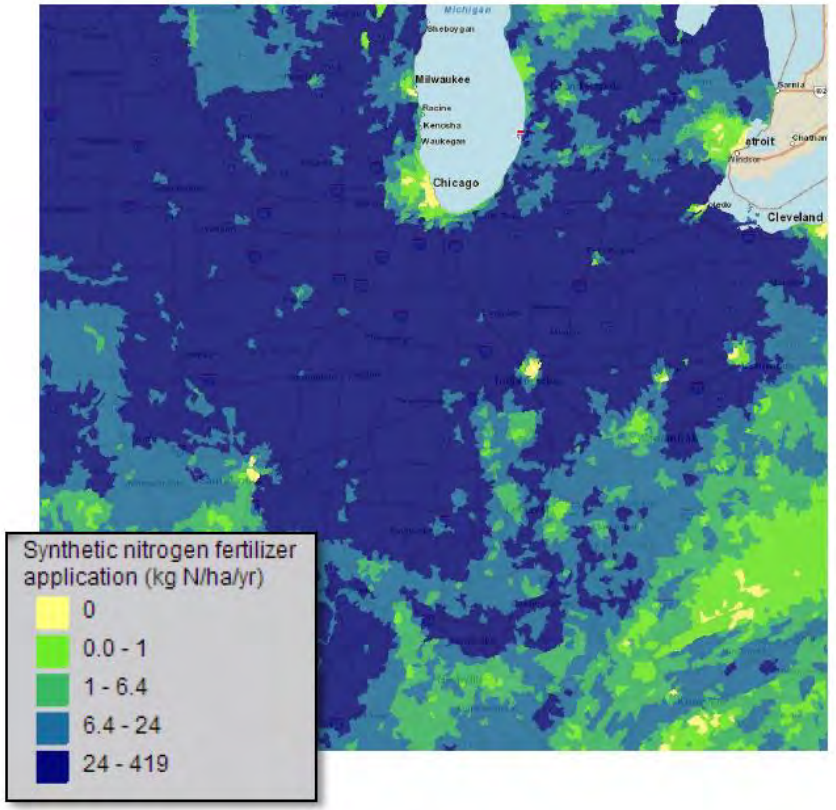
Example Benefit Category – Clean Water
Stream length impaired by metals (from 303d list)



Water Stressors

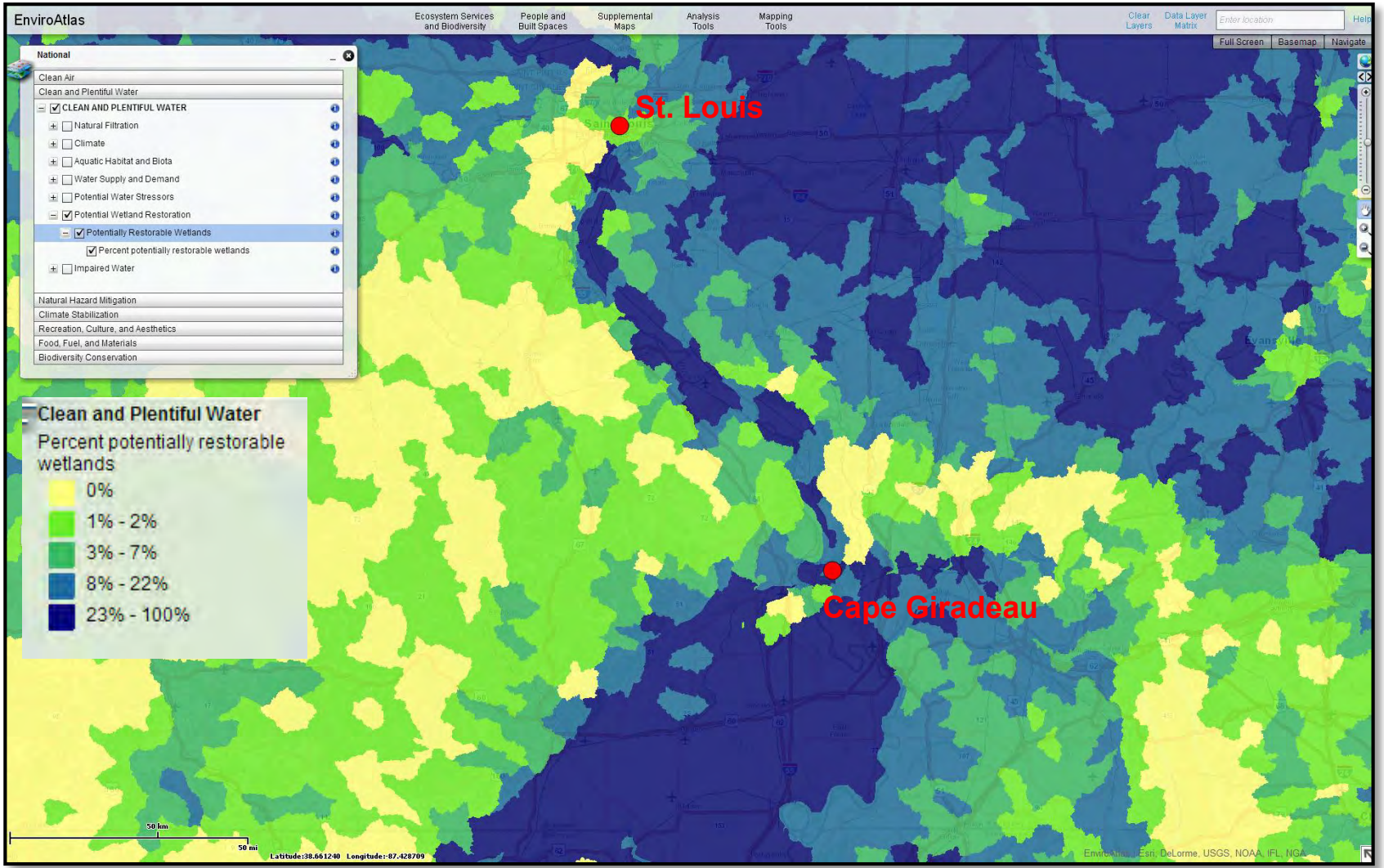


Total Nitrogen Deposition

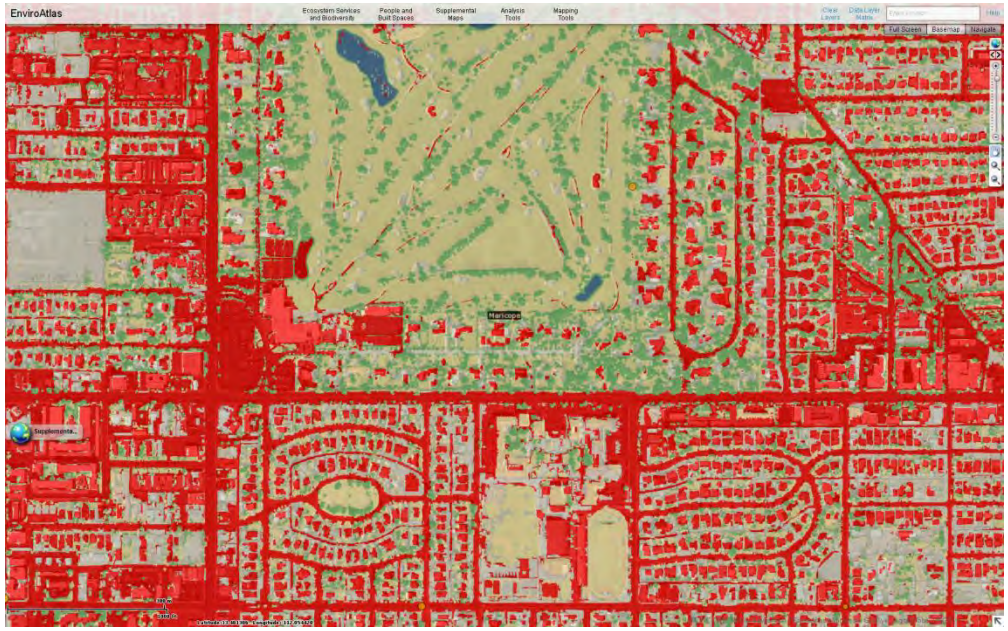


Synthetic Nitrogen Fertilizer Application

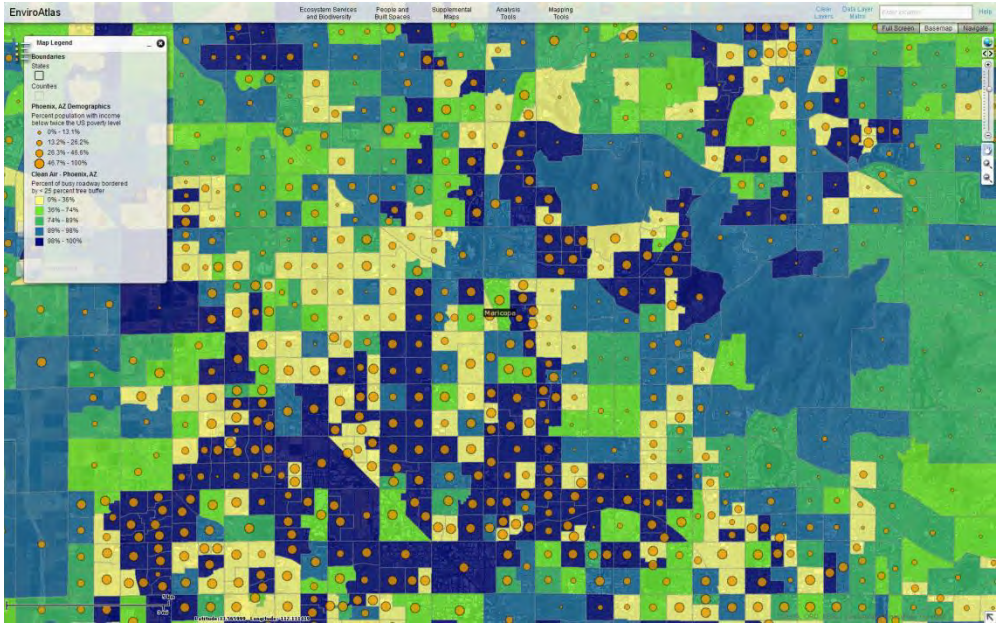
Example National Data Layer
Percent Potentially Restorable Wetlands



Communities – Phoenix, AZ



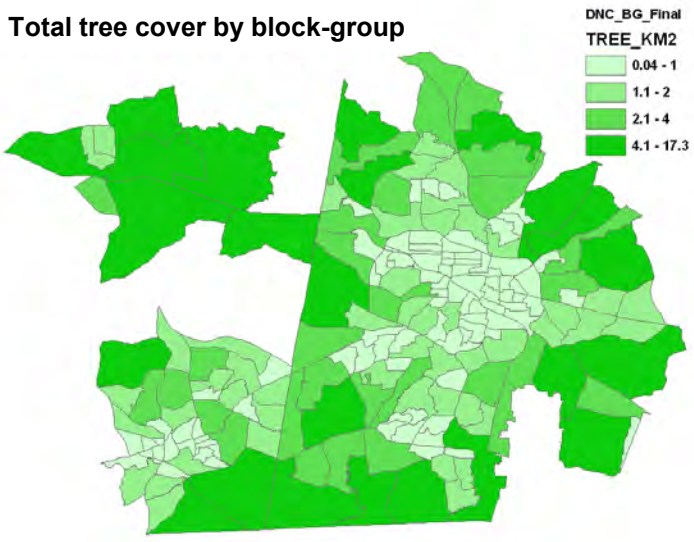
Begins with 1 meter land cover classification



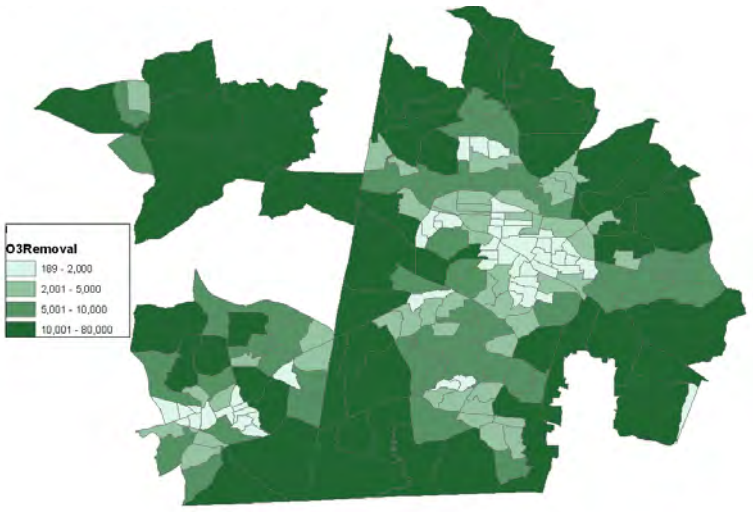
Allows for examination of ecosystem services and socio-economic data

We partner with USFS to evaluate tree cover within communities and the health related benefits.

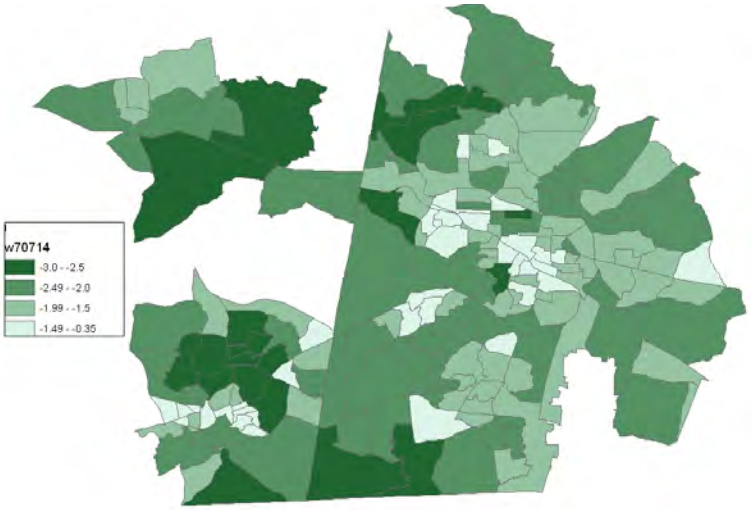
Total tree cover by block-group



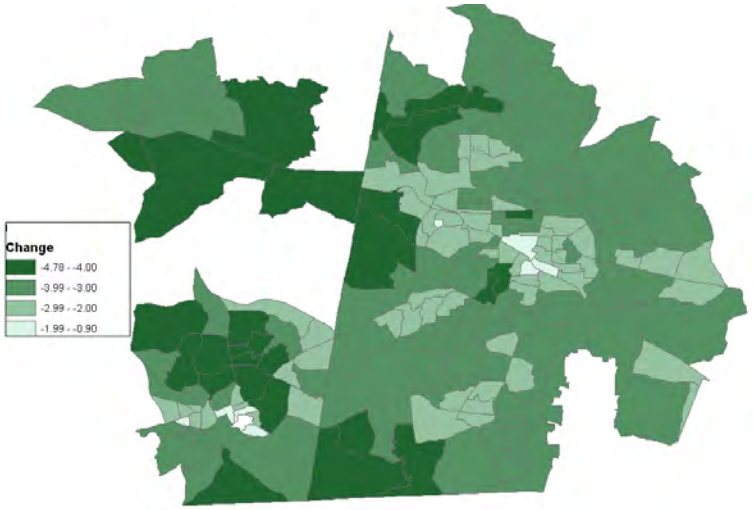
Ozone removal (kg/yr) by tree cover



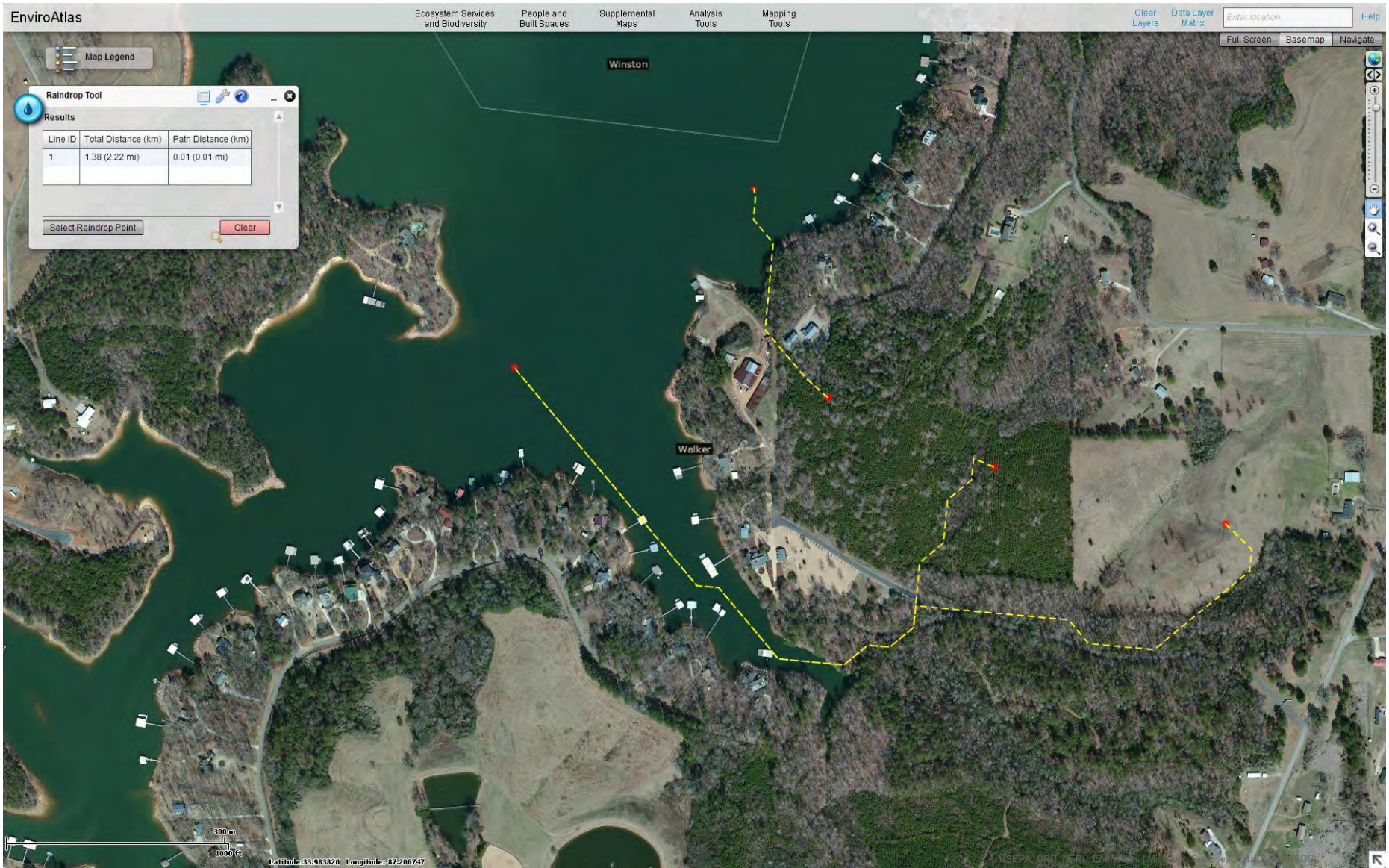
Reduc. ambient temp. (07/07/10 @2pm) due to tree cover



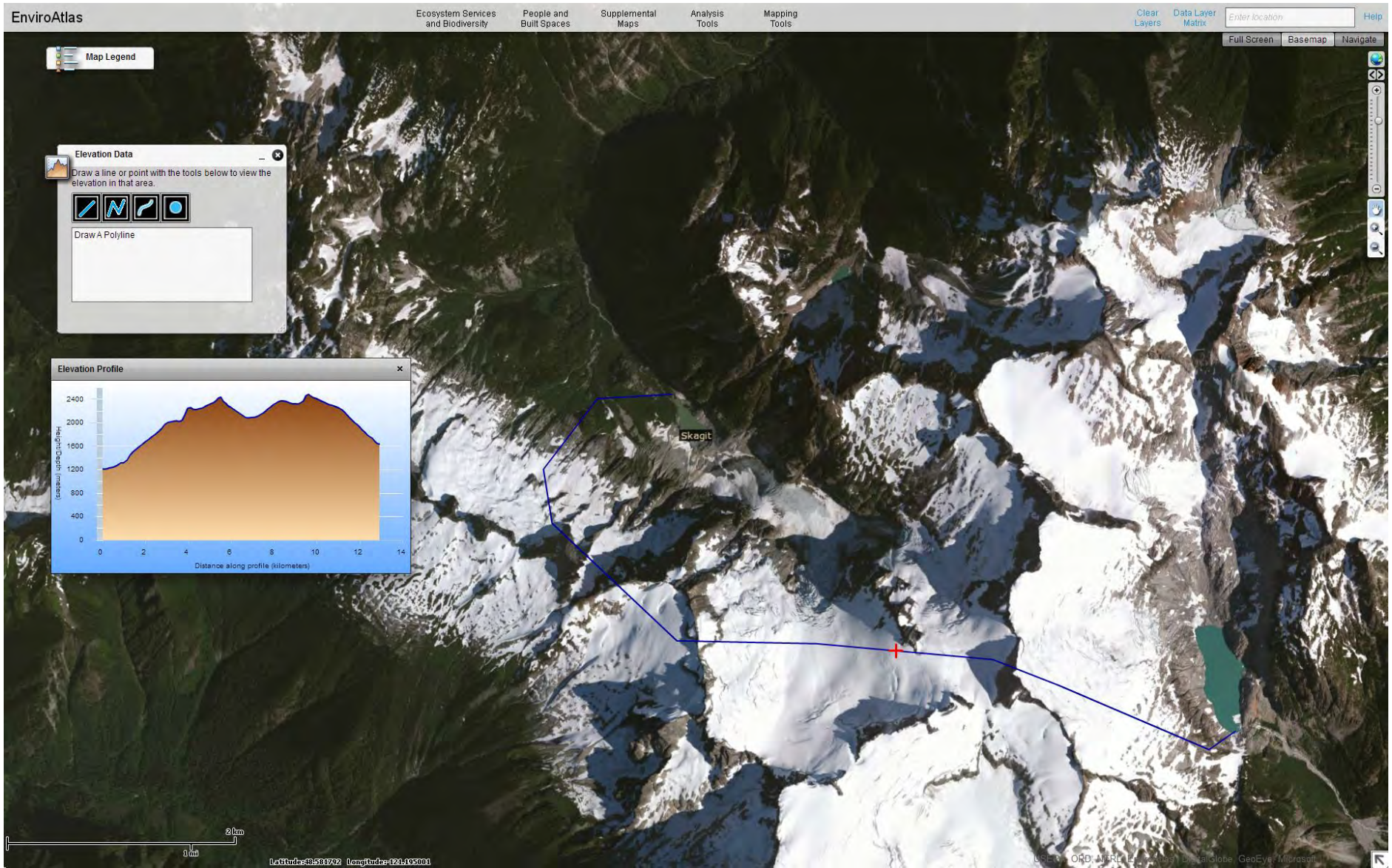
Percent change in streamflow (m^3/yr) due to tree cover



Analytic tools within EnviroAtlas: Raindrop tool



Analytic tools within EnviroAtlas: Elevation Profiles

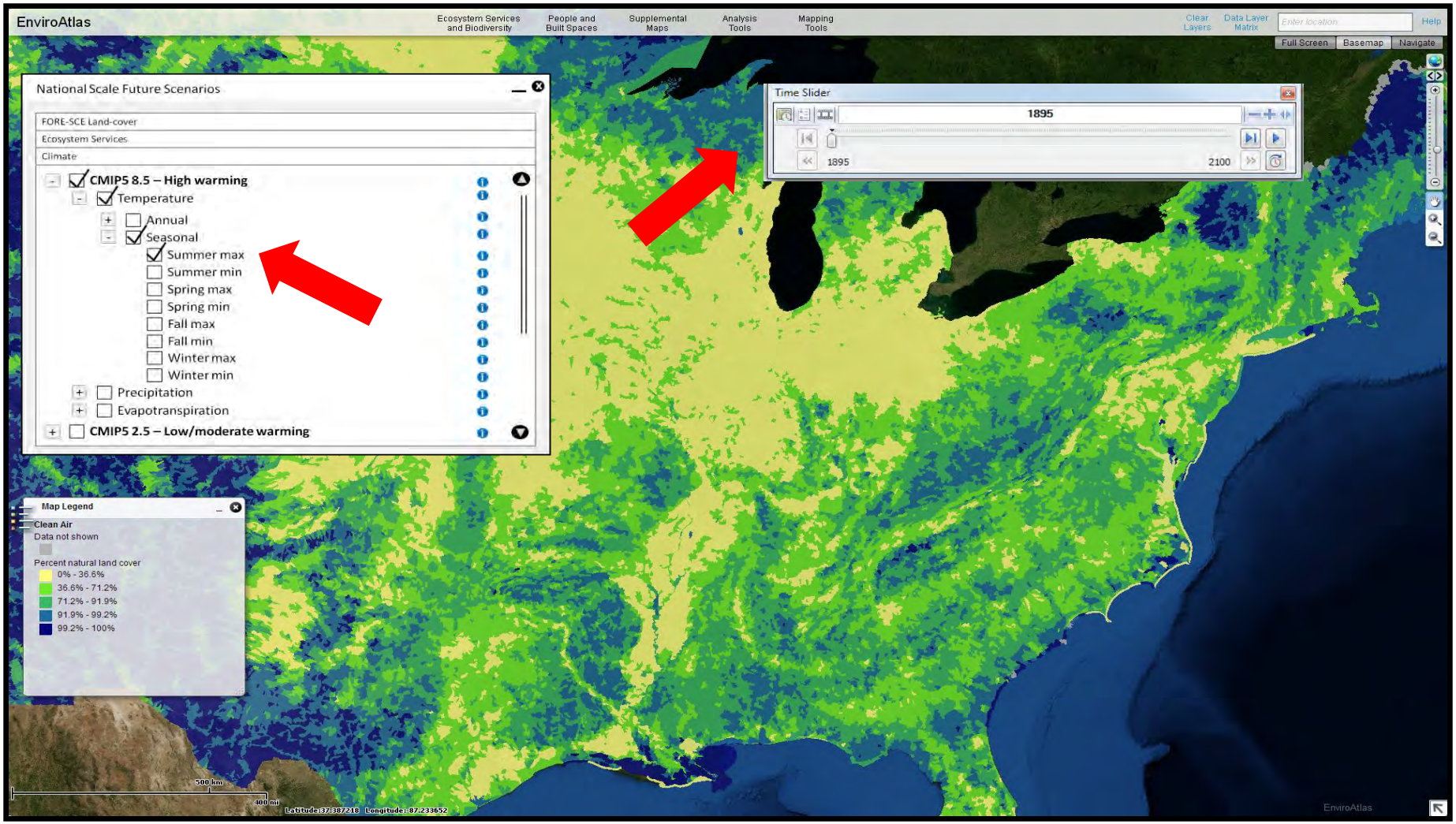


EnviroAtlas: Connecting People, Health, Nature, and Economy

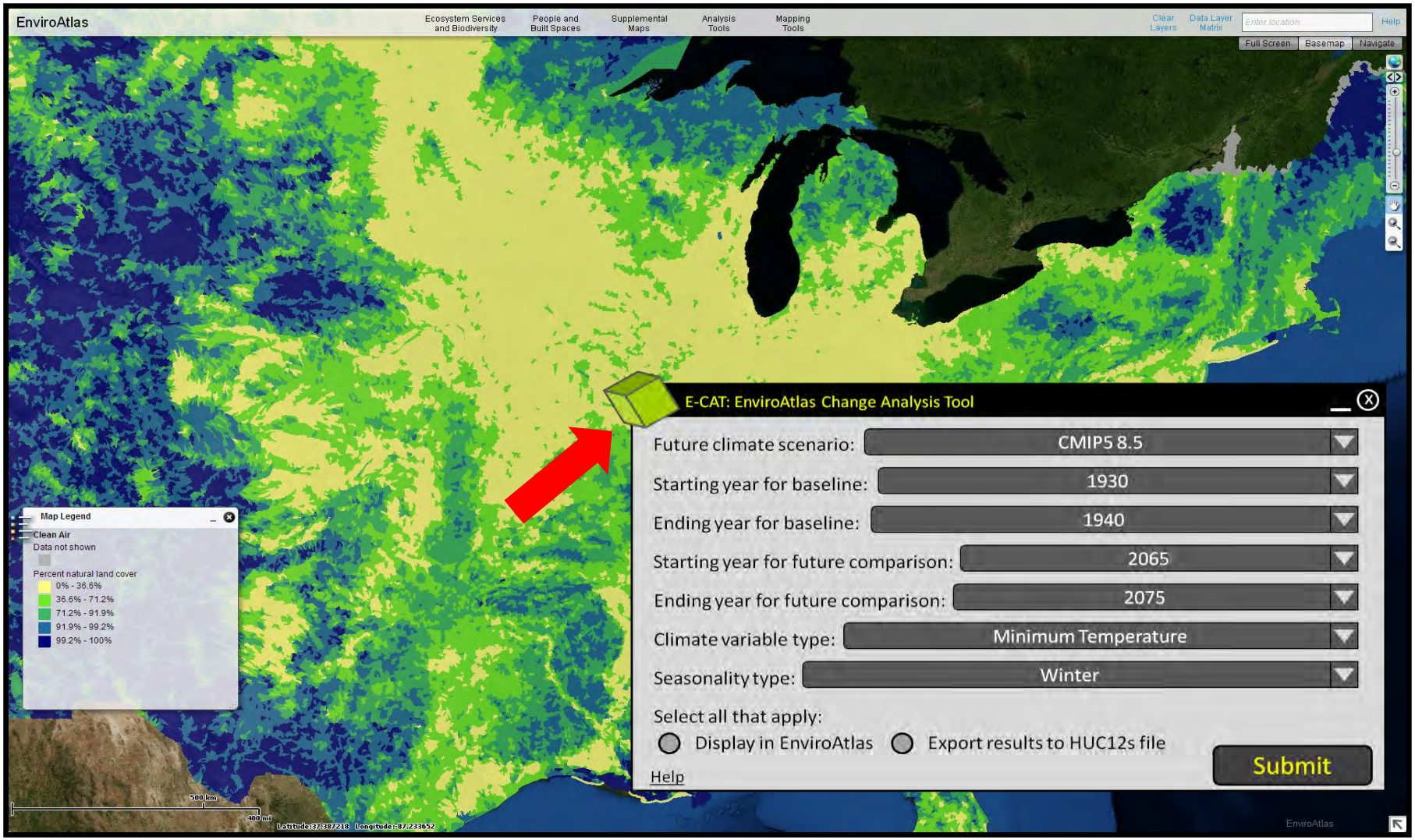
Future version of EnviroAtlas will include:

- Future land use scenarios
- Future climate scenarios
- Future water needs scenarios
- Summarized (modeled) point discharges, nutrients, sediment, and toxics
- Percent headwater area
- Amount of agriculture not draining through natural buffer
- Nitrogen removal efficiency indicators
- Runoff indicators
- Ability to navigate up and downstream

Future Climate Scenarios



Climate change analysis tools:



Many Opportunities to Collaborate with EnviroAtlas

- Spatial Analysis Tools
- Spatially explicit indicators
- Use of data and tools to develop “Use Cases”
- Interoperability with other Tools
- Non Spatial Tools

- Clean air
- Clean and plentiful water
- Biodiversity conservation
- Food and raw materials
- Natural hazard mitigation
- Climate stabilization
- Recreation, culture, and aesthetics
- Linkages between ecosystems and human health

EnviroAtlas Spatially Explicit data & Tools

Project Charter to 2019

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…

An incredibly talented group of Student Services Contractors including: Alexandra Sears, Jessica Daniel, Jessica Jahre, Elena Horvath, Doug Browning, Emily Sanders, Jeremy Baynes, Mathew Dannenberg, Pat Johnson,

Public Health & ORISE Fellows: Kathleen Bush, Kevin Ramsey, Brian Pickard, Samantha Sifleet

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

Thank You

ENVIROATLAS available at:

http://enviroatlas.epa.gov/EnviroAtlas/