Assessing the Impact of Ecological Considerations on Forest Biomass Projections

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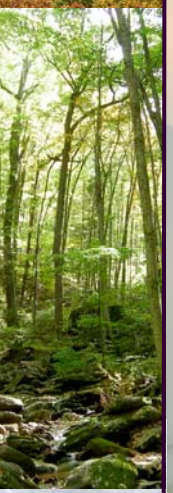
Forest Biomass

- Replaces fossil fuels with a cleaner, renewable alternative
- Lowers CO_2 emissions, helping achieve climate change goals
- Reduces dependence foreign oil and gas imports
- Supports growth of agricultural, forestry, and rural economies
- Fosters new domestic innovation and industry

- Climate impacts from extraction, transportation, refining and burning
- Soil degradation
- Increased water run-off and pollution
- Land use change, leading to habitat loss and decreasing biodiversity
- Pressure for conversion from diverse habitat to managed resource


- Forest biomass extraction can conflict with critical ecological values and sustainability goals.
- The ecological consequences are not adequately understood and have not been fully prepared for.
- In order to move toward ecological sustainability, biomass energy production must avoid or not degrade important ecological values.

Study Area

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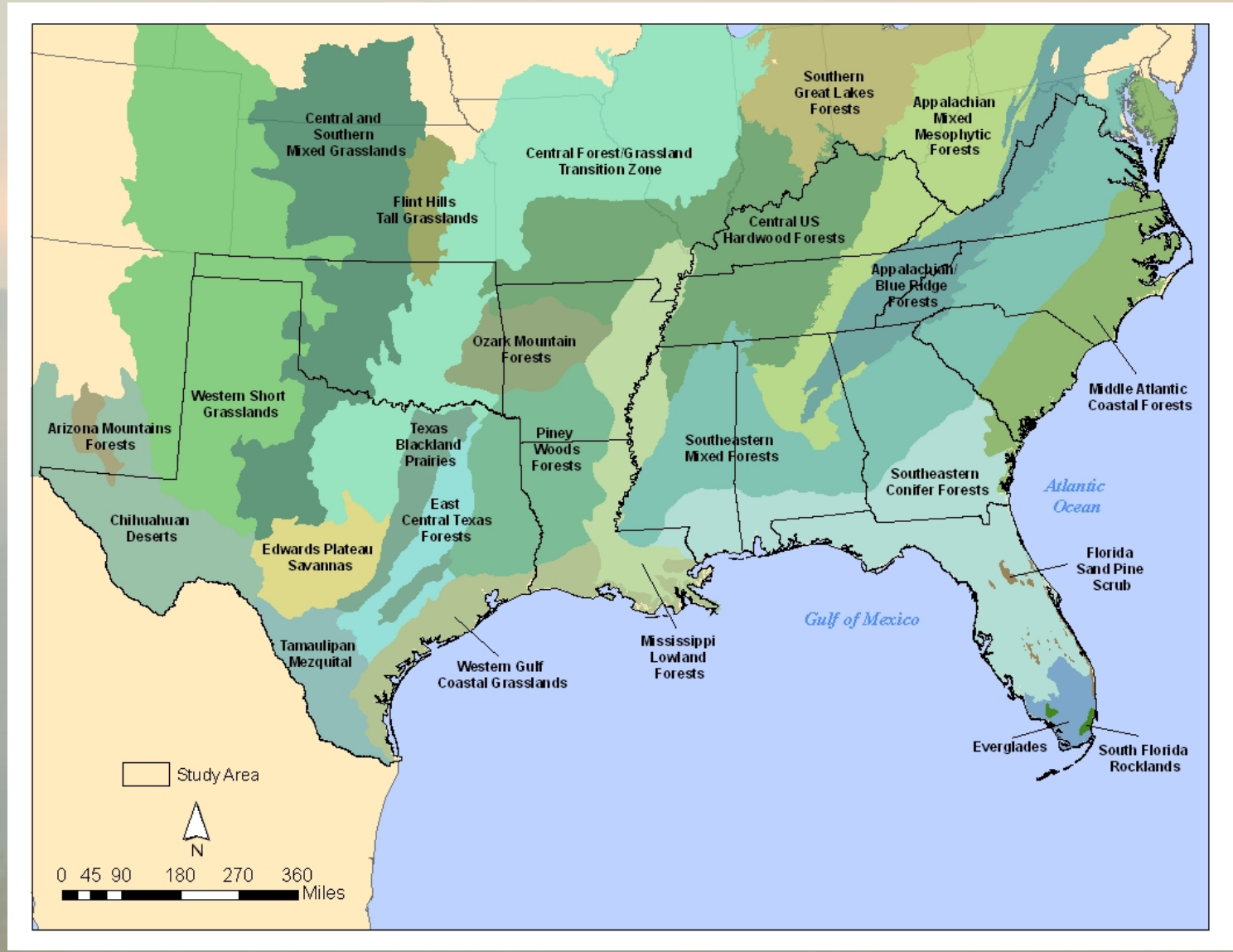
Central and Southern Mixed Grasslands
Central Forest/Grassland Transition Zone
Southern Great Lakes Forests
Appalachian Mixed Mesophytic Forests
Flint Hills Tall Grasslands
Central US Hardwood Forests
Appalachian/ Blue Ridge Forests
Ozark Mountain Forests
Western Short Grasslands
Arizona Mountains Forests
Texas Blackland Prairies
Piney Woods Forests
Southeastern Mixed Forests
Middle Atlantic Coastal Forests
Southeastern Conifer Forests
Atlantic Ocean
Chihuahuan Deserts
East Central Texas Forests
Edwards Plateau Savannas
Florida Sand Pine Scrub
Gulf of Mexico
Tamaulipan Mezquital
Western Gulf Coastal Grasslands
Mississippi Lowland Forests
Everglades
South Florida Rocklands
Study Area
N
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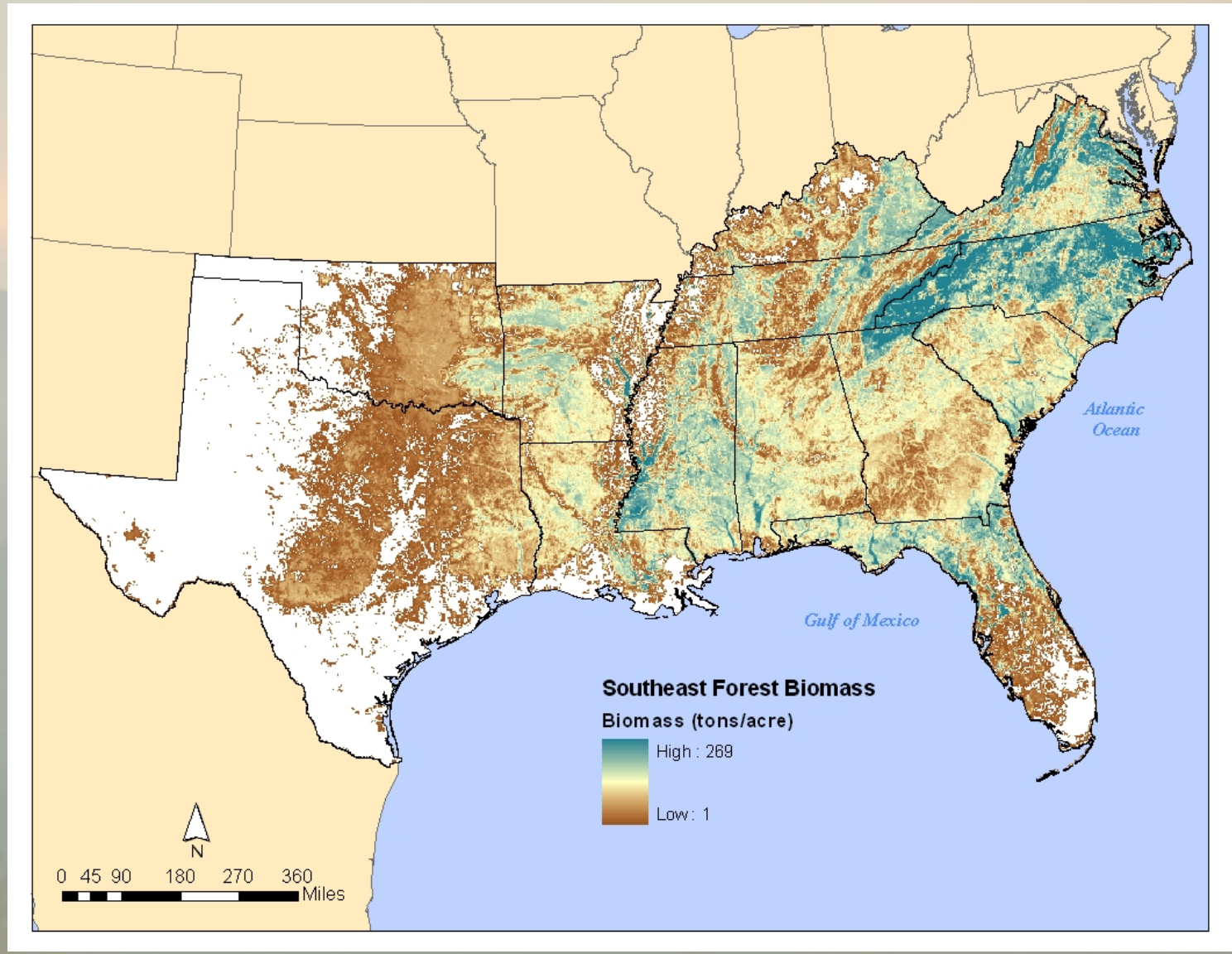
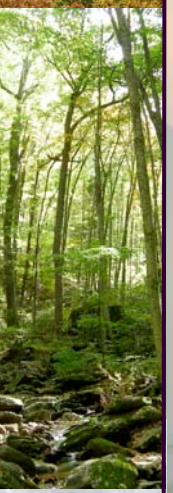
Miles

Forest Biomass



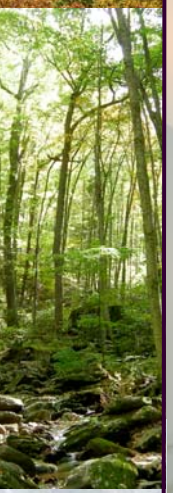




Methods

1. Analyze the effect of conservation values on biomass projections.

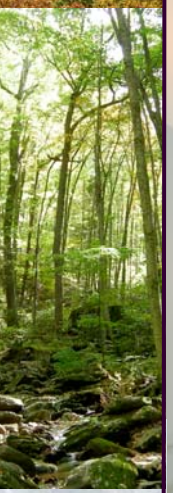
2. Quantify the effect of data resolution on resulting biomass values.

3. Consider the known occurrences of threatened and endangered species.


Methods: Conservation Values

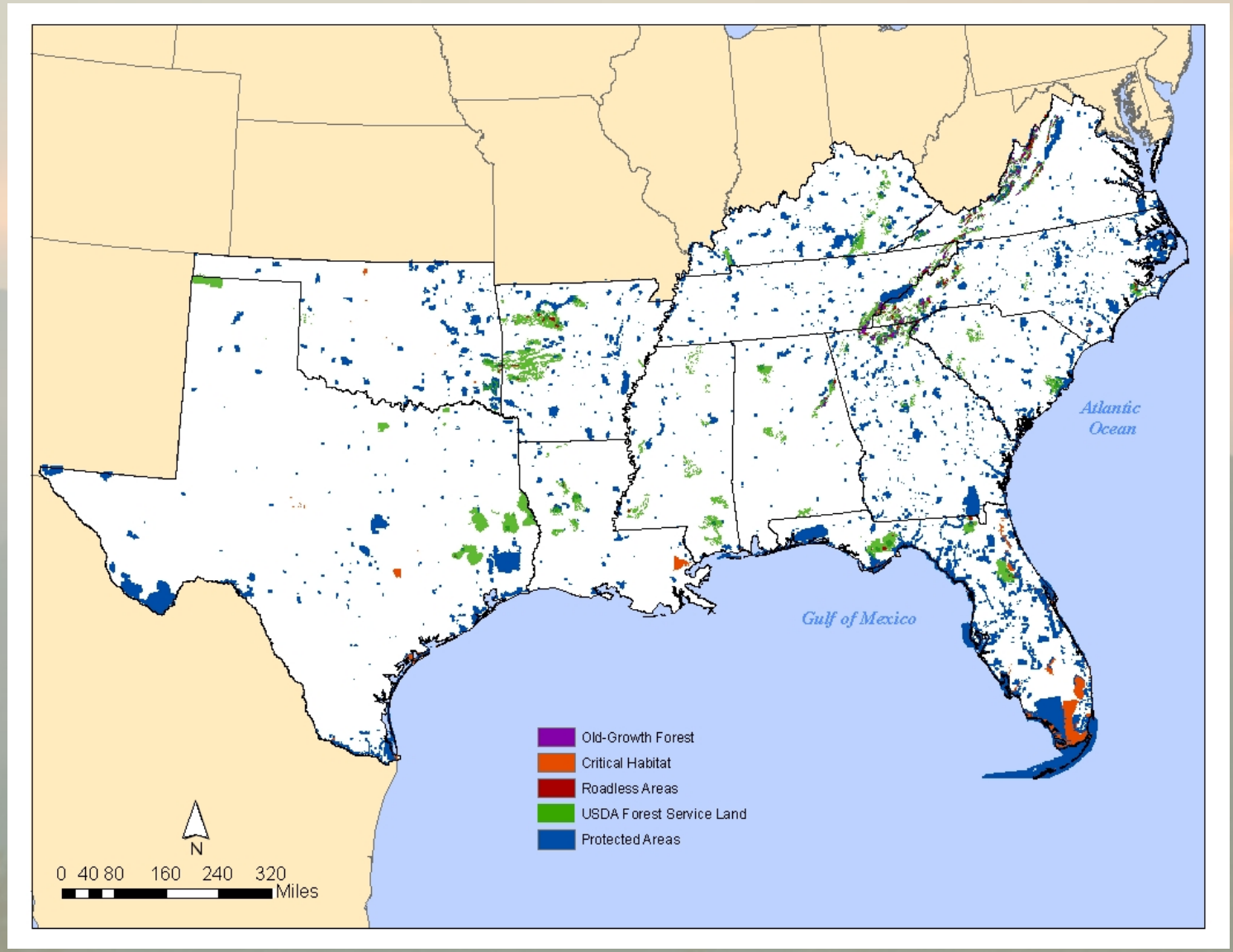
- Administrative
  - USDA Forest Service Land
  - Inventoried Roadless Areas
  - Existing Protected Areas
  - Designated Critical Habitat
- Ecological
  - Areas of Steep Slope
  - Old-Growth Forest
  - Wetlands
  - Freshwater and Coastline Buffers
- Wildland-Urban Interface (WUI)


Methods: Data

Name	Type	Scale/ Resolution	Source	Year
Contiguous U.S Biomass map	Raster	250 meter	USDA Forest Service	2007
Critical Habitat	Vector	Various	US Fish and Wildlife Service	2006
Inventoried Roadless Areas	Vector	1:24,000 - 1:126,720	USDA Forest Service	2008
National Hydrography Dataset	Vector	1:100,000	US Environmental Protection Agency US Geological Survey	2005
National Land Cover Dataset	Raster	30 meter	US Geological Survey	2001
National Wetlands Inventory	Vector	1:24,000/1:25,000	US Fish and Wildlife Service.	2007
Potential Old-Growth Forest	Vector	Unknown	Southern Appalachian Man and Biosphere Project	1996
Protected Areas Database	Vector	1:24,000 - 1:100,000	Conservation Biology Institute.	2006
SRTM Digital Elevation Data	Raster	90 meter	International Centre for Tropical Agriculture	2006
Wildland Urban Interface	Vector	1:100,000	SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin, Madison	2005

Methods: Data



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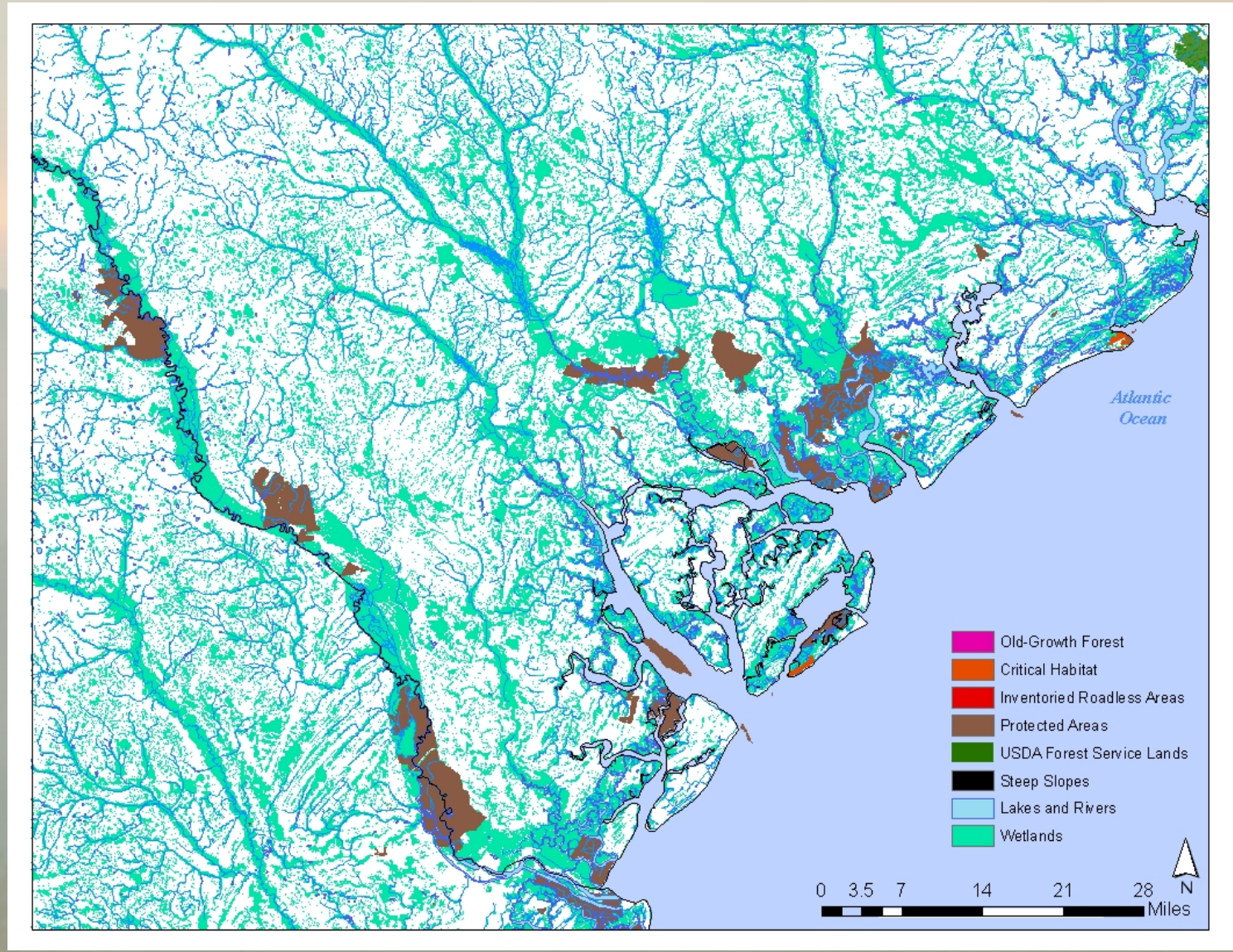
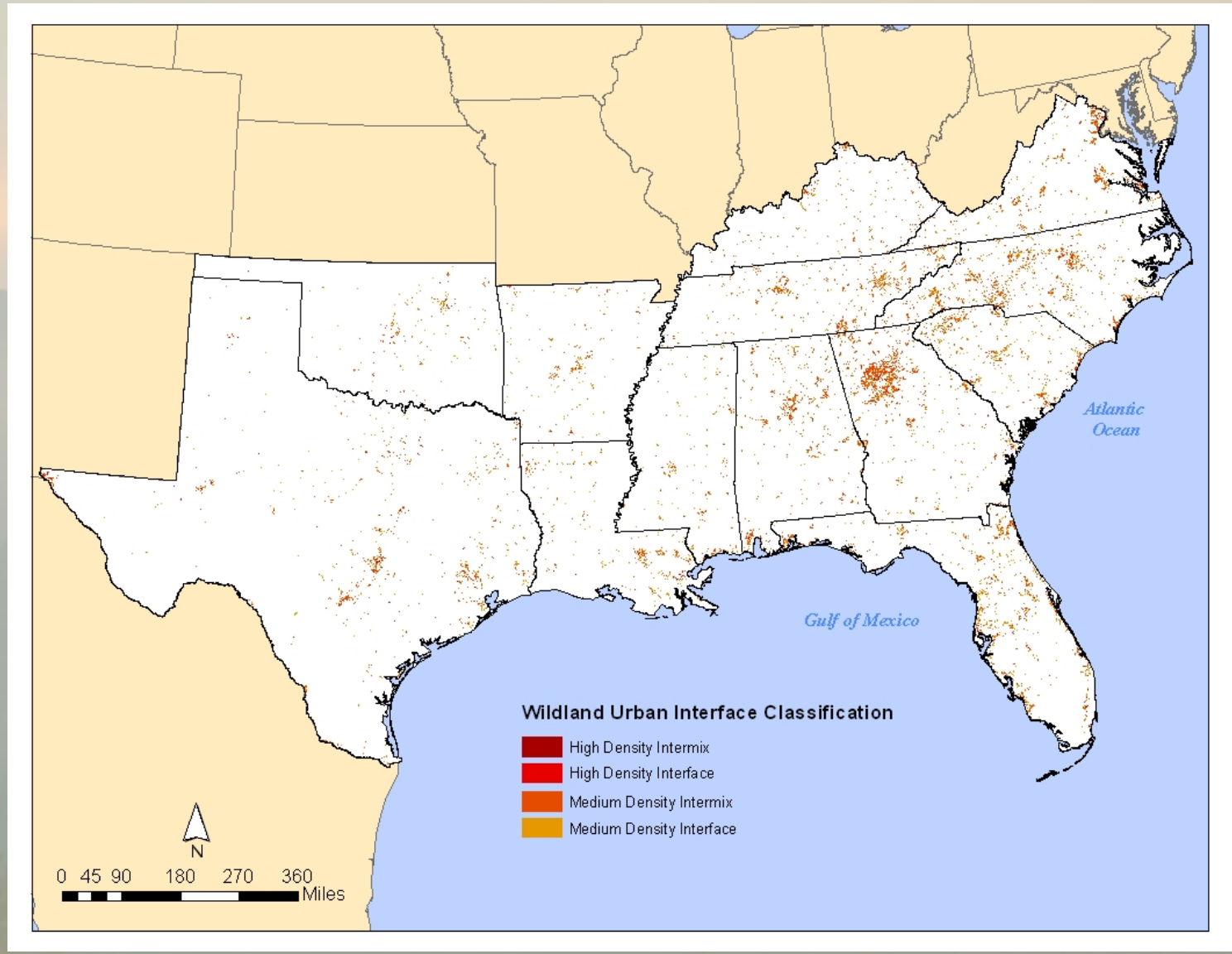


Ecological Values



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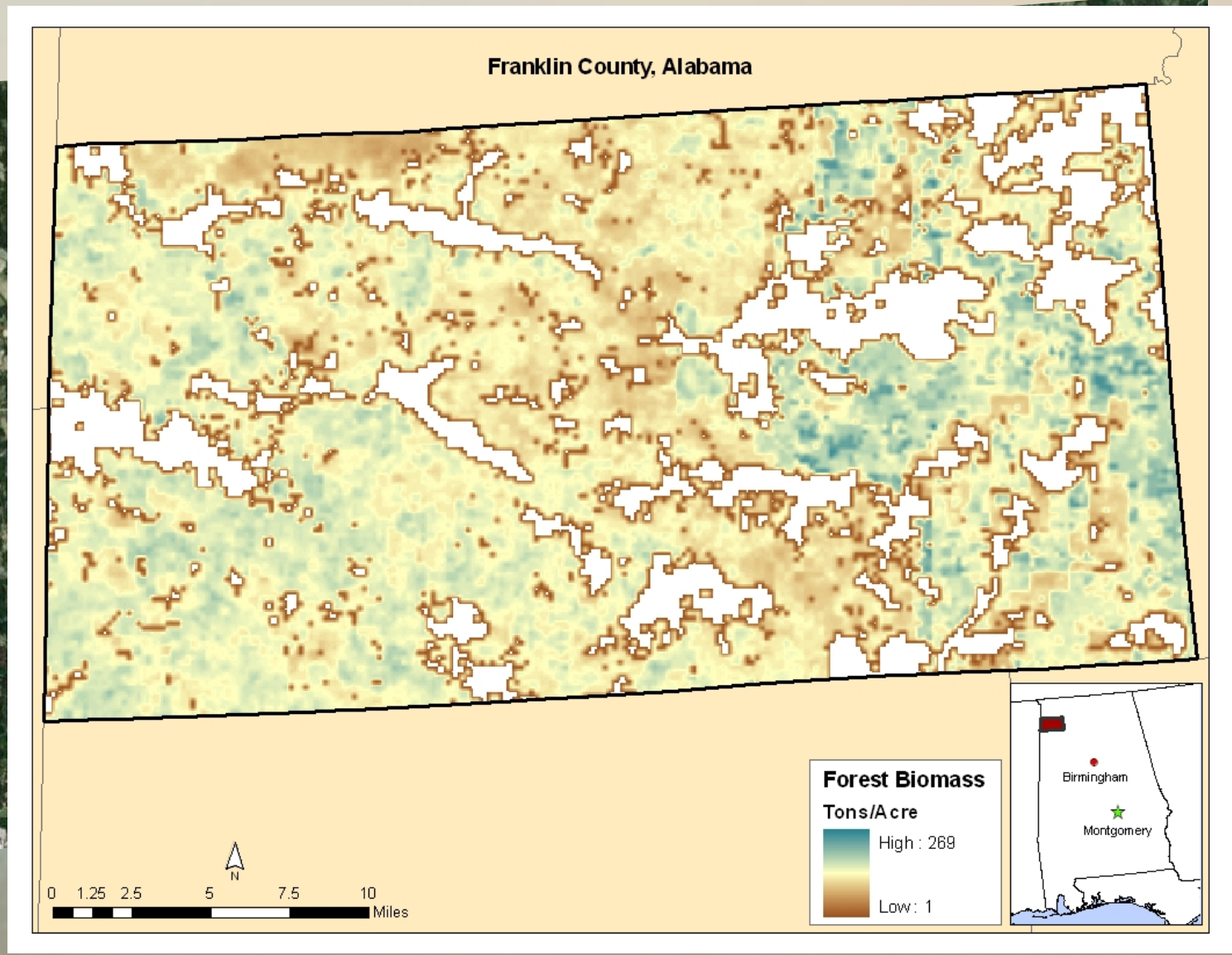

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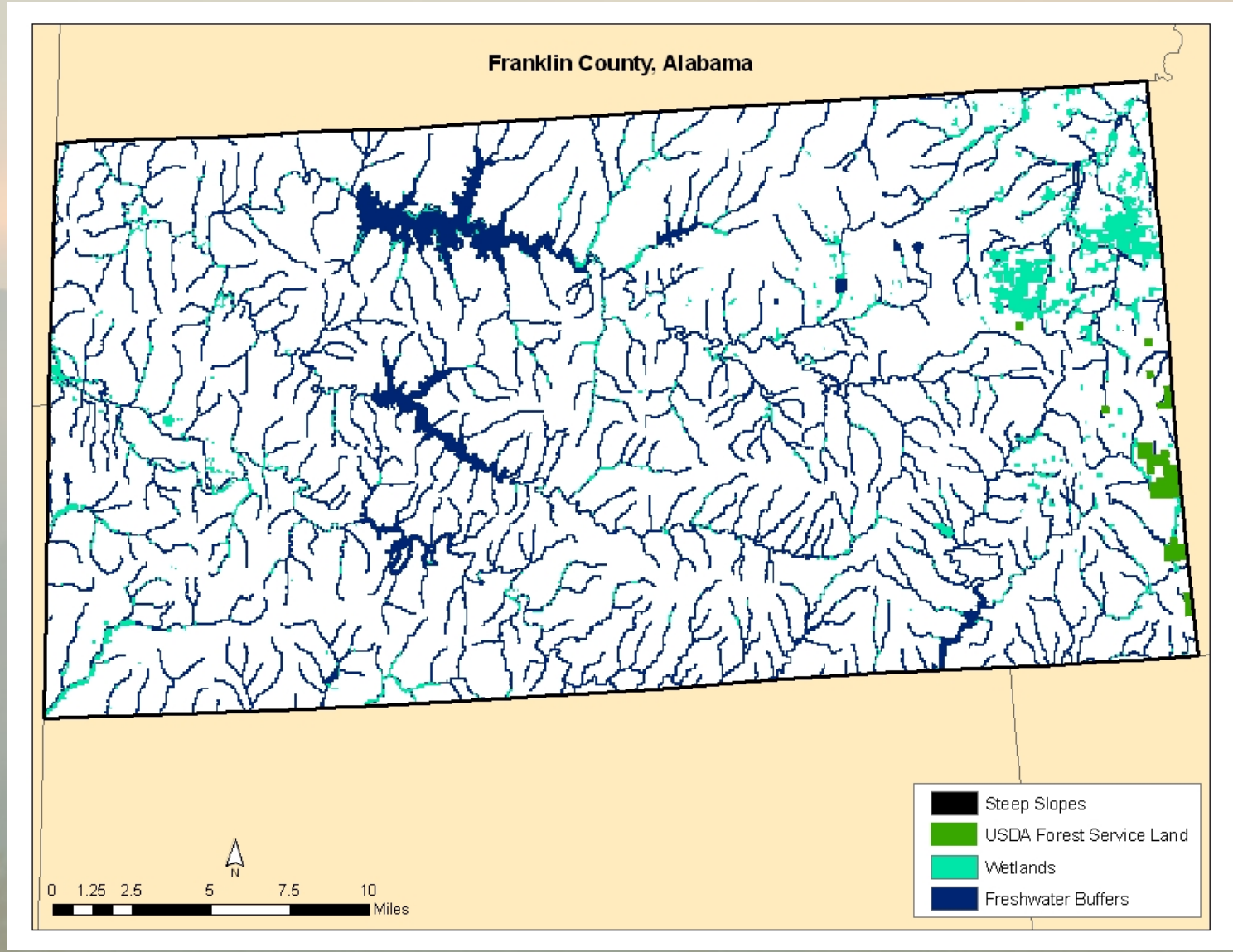

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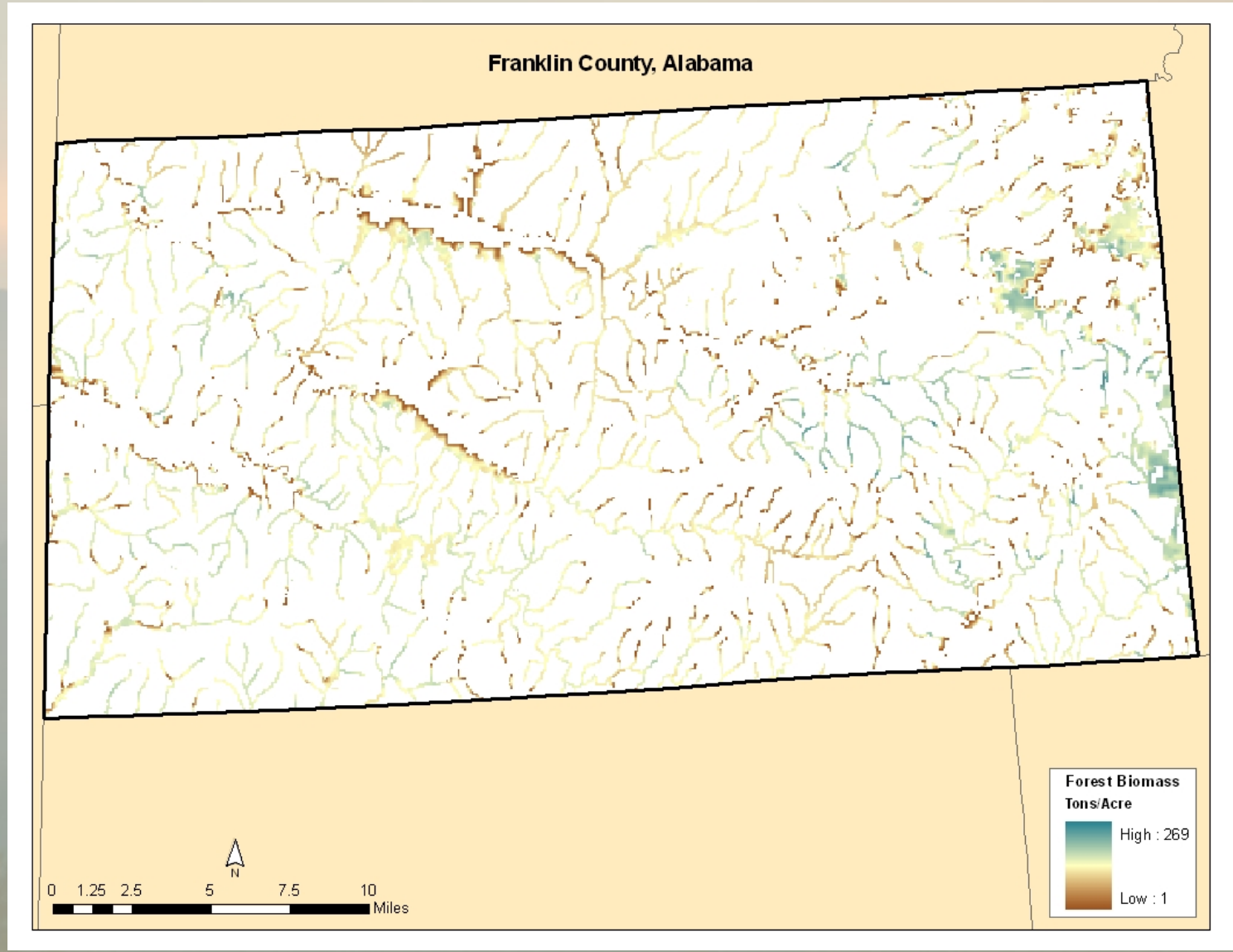

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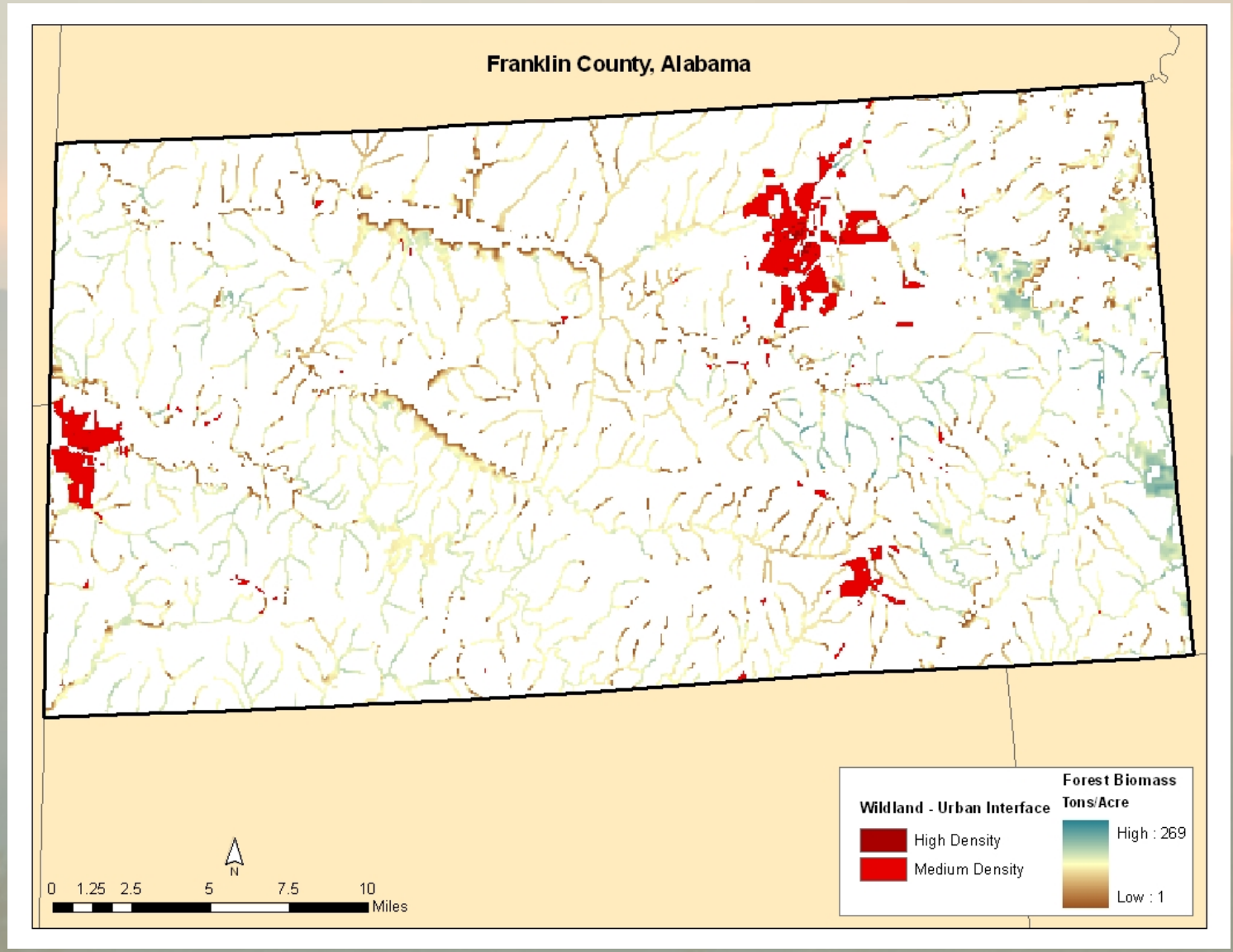

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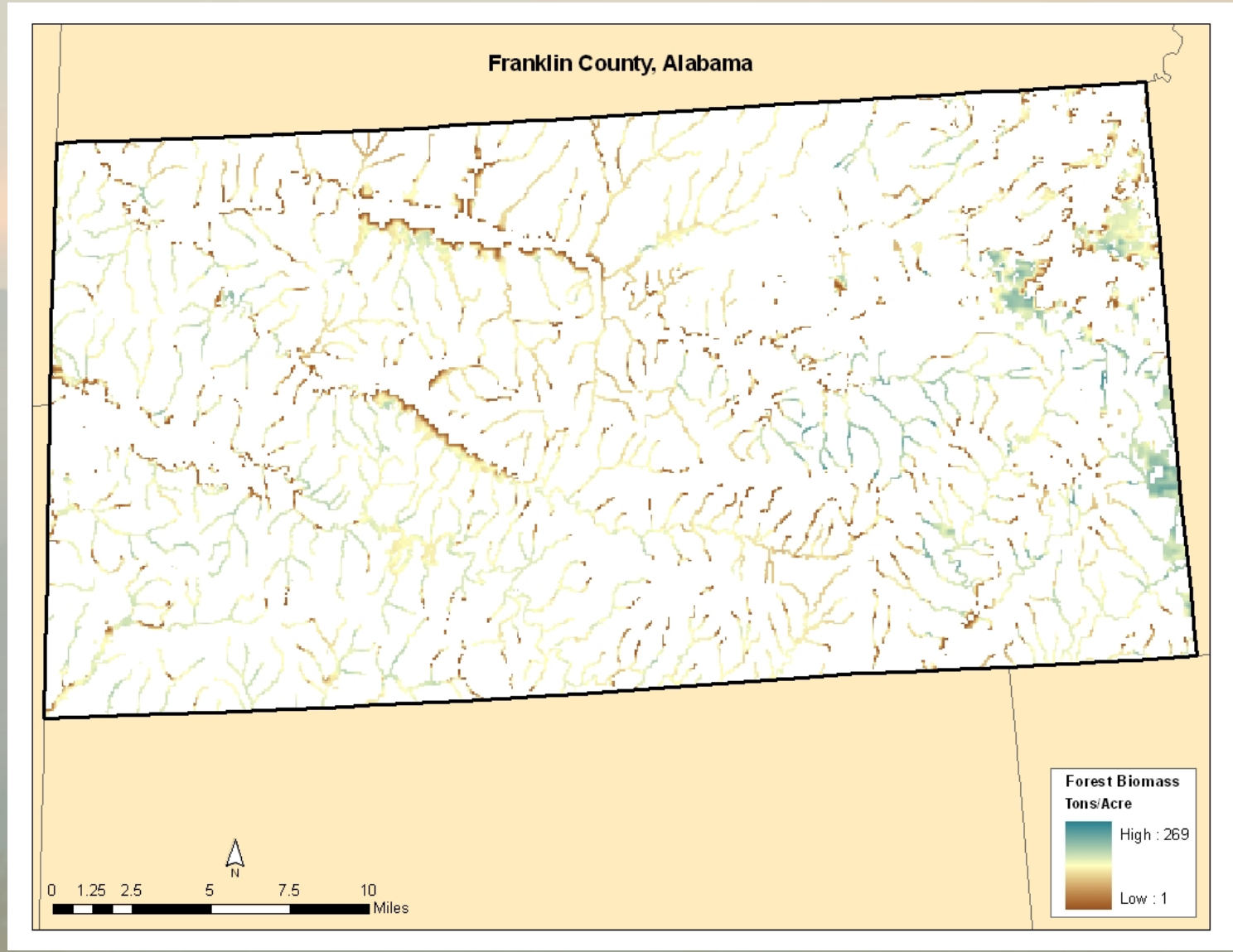

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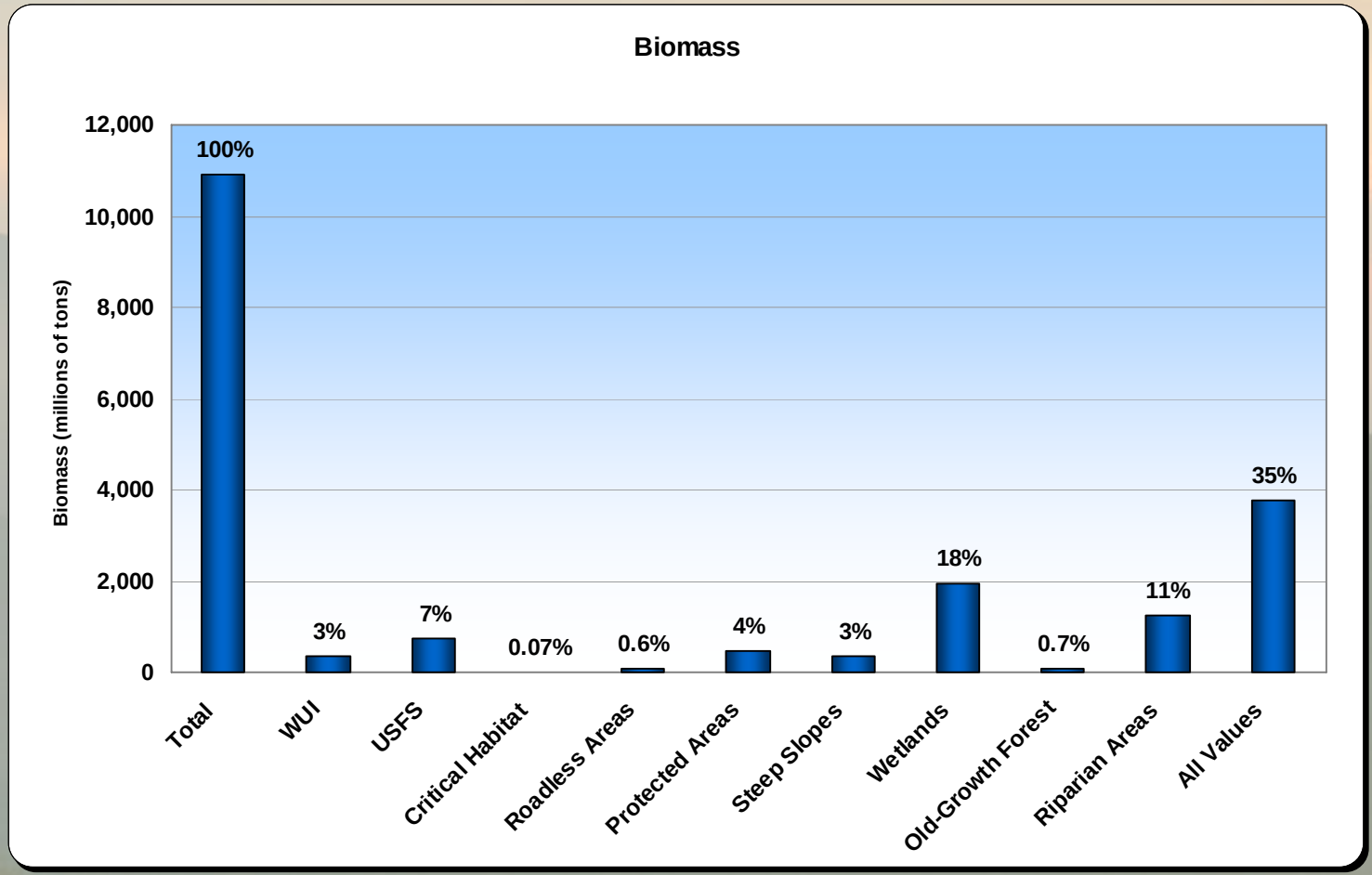

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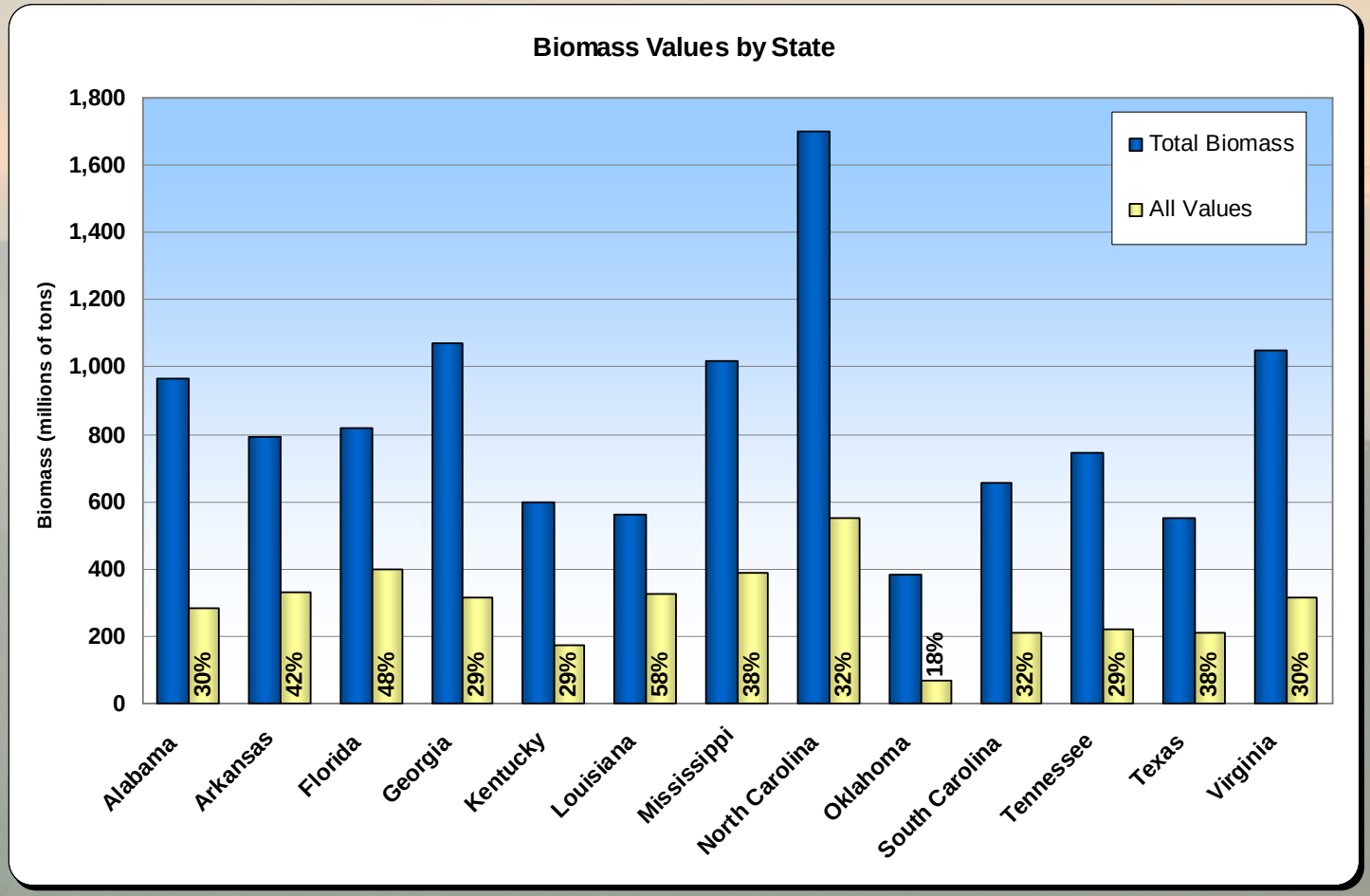

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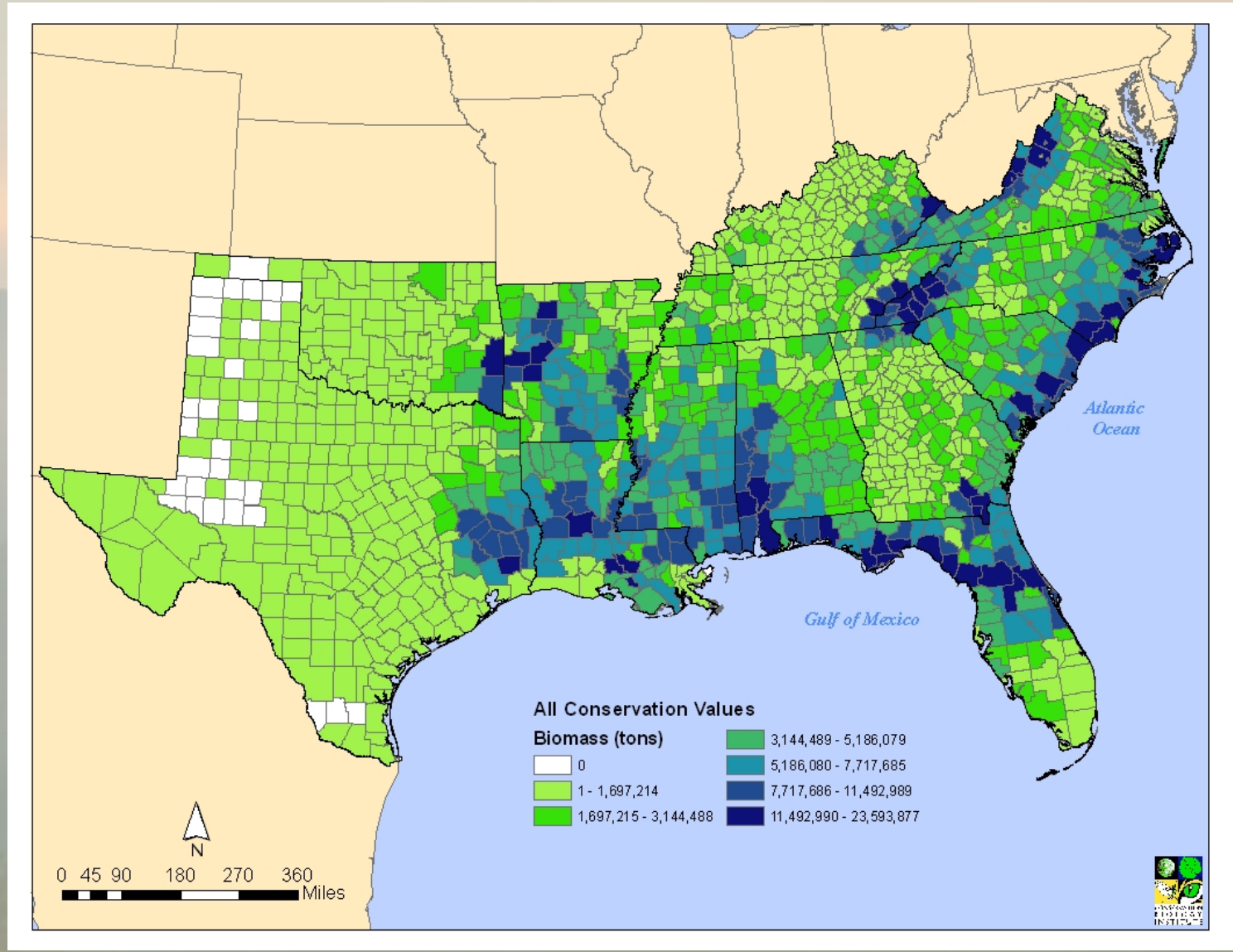

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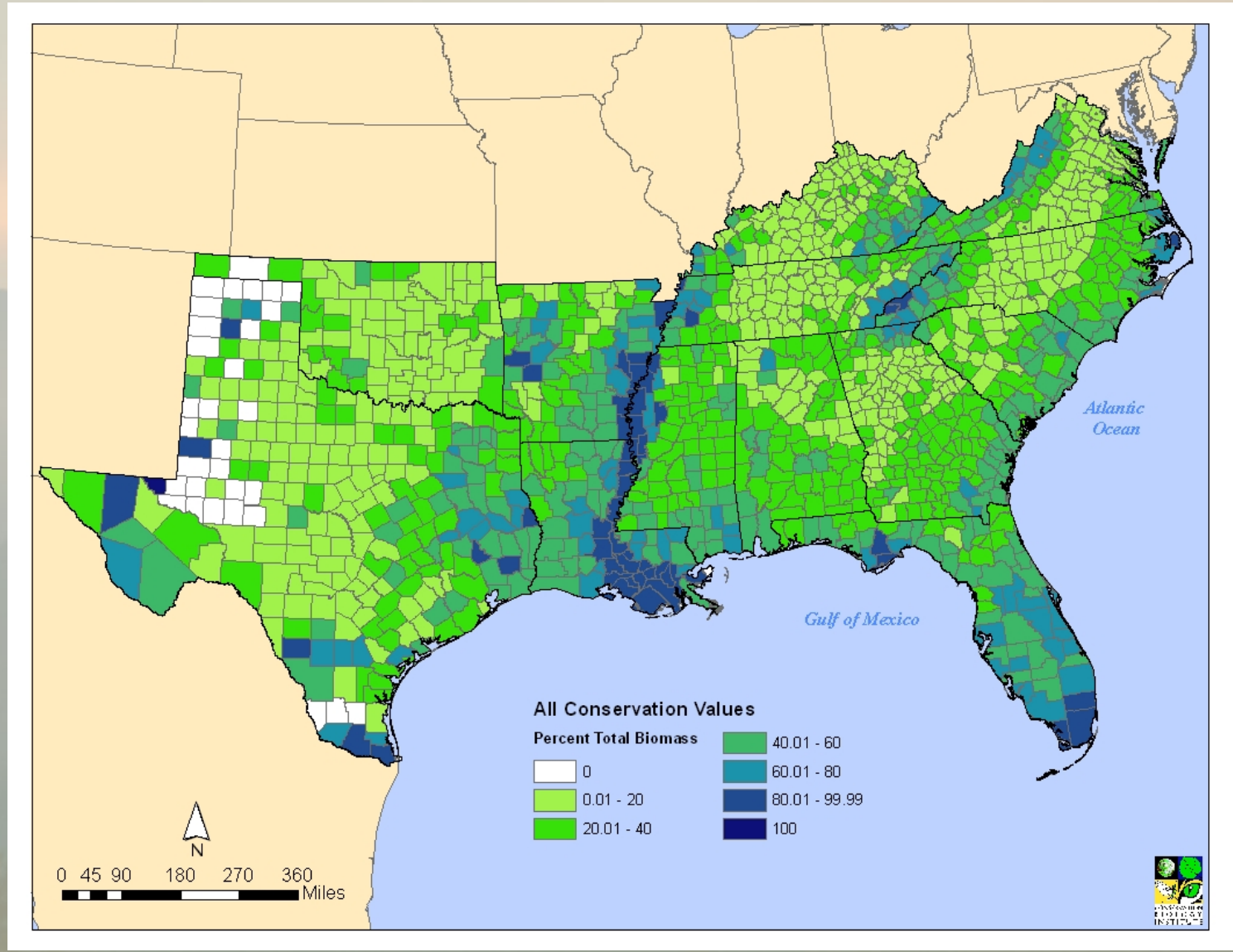


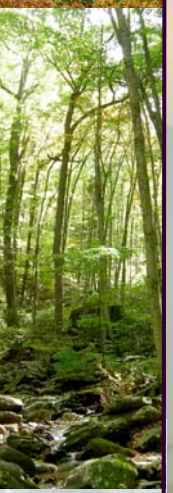


Process: Freshwater and Coastline buffers

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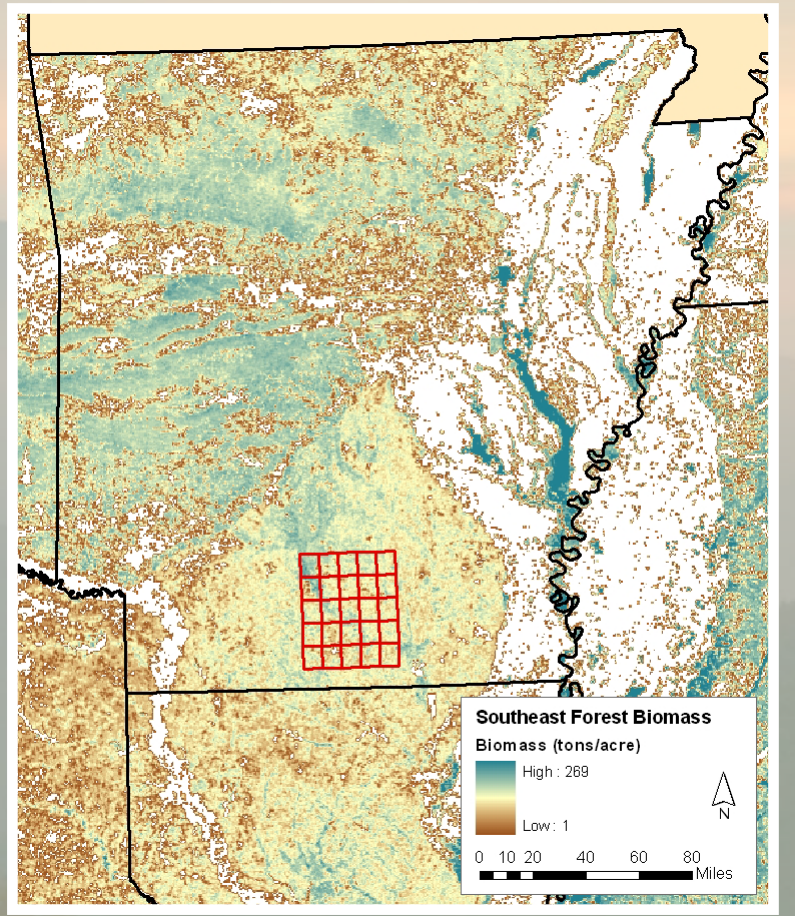
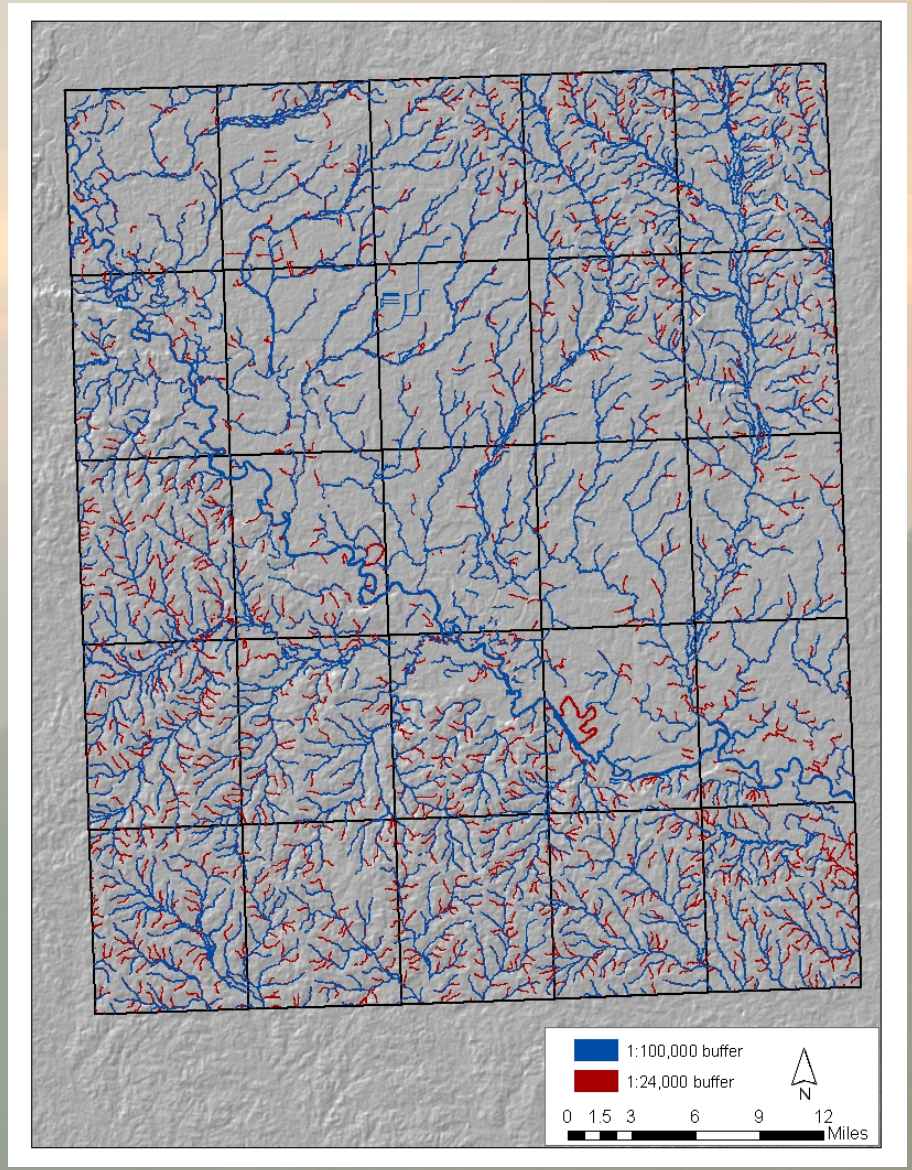
Process: Riparian Buffers





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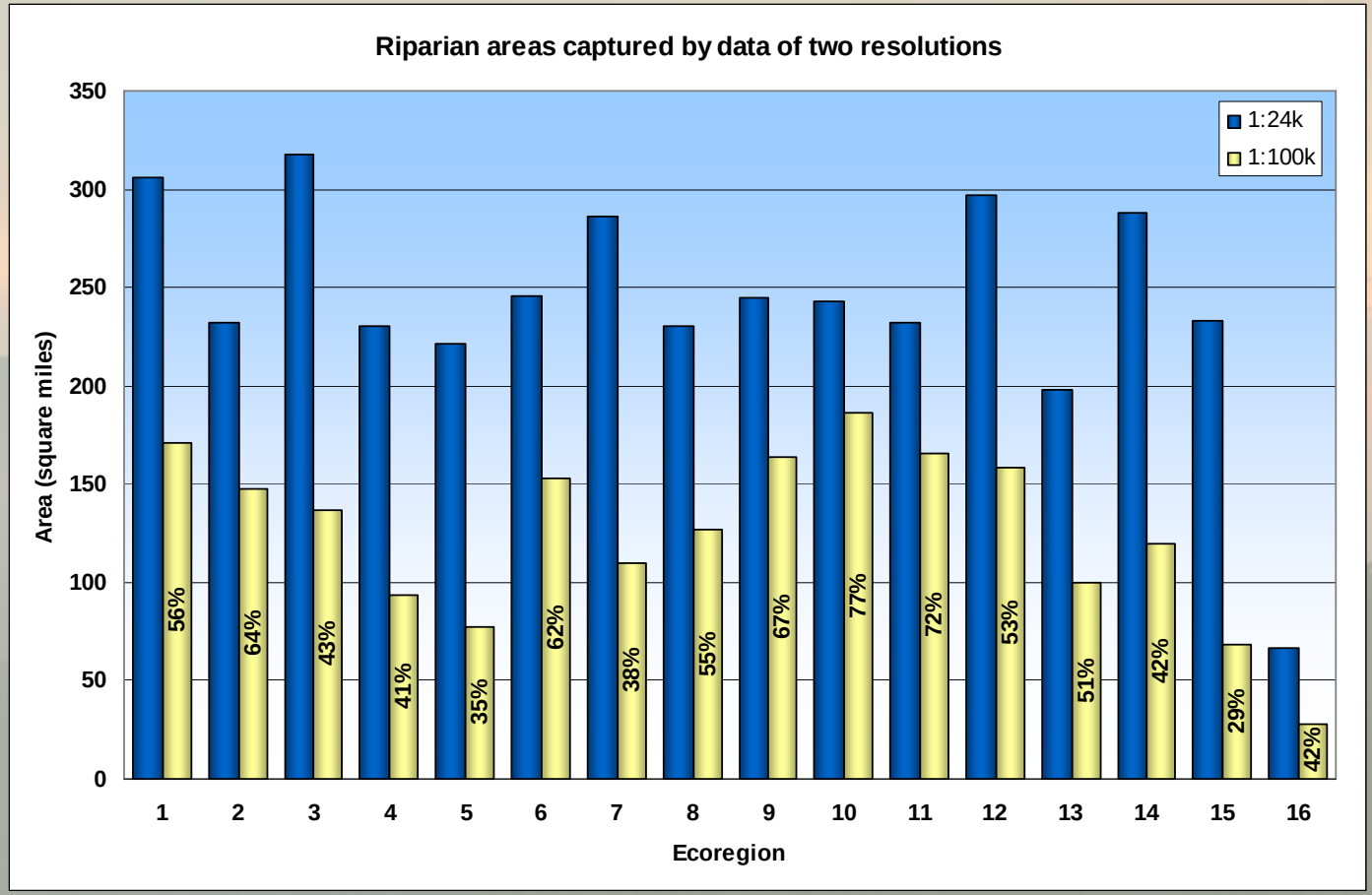
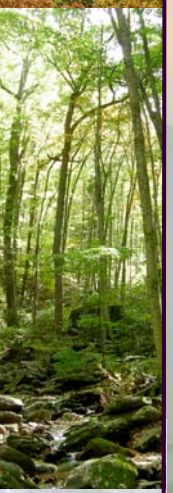


1	Appalachian/Blue Ridge Forests	7	Edwards Plateau Savannas	12	Southewastern Mixed Forests
2	Appalachian Mixed Mesophytic Forests	8	Middle Atlantic Coastal Forests	13	Tamaulipan Mezquital
3	Central Forest Grassland Transition Zone	9	Ozark Mountain Forests	14	East Central Texas Forests and Texas Blackland Priaries
4	Chihuahuan Deserts	10	Piney Woods Forests	15	Western Gulf Coastal Grasslands
5	Central and Southern Mixed Grasslands	11	Southeastern Conifer Forests	16	Western Short Grasslands
6	Central US Hardwood Forests				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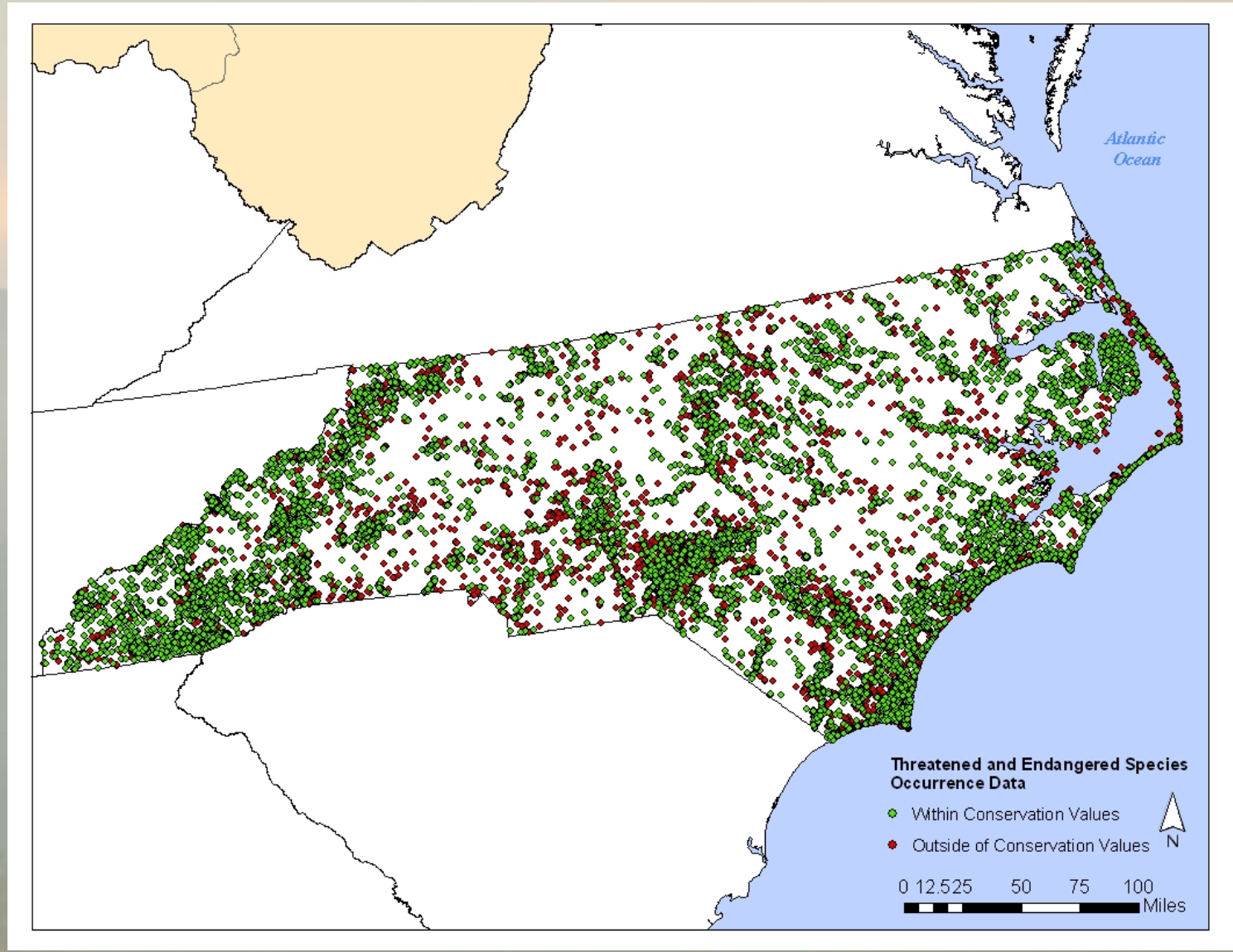
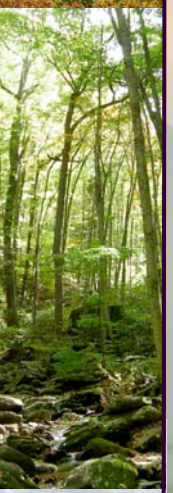
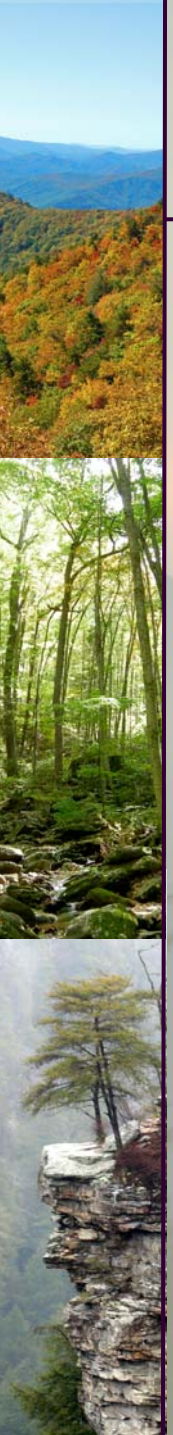



Conclusion

- Initial approach done with readily available spatial data.
- Easily replicable at many scales, in different areas, and for different values.
- Resolution of data must be taken into account when implementing biomass activities on the ground.
- Additional data, particularly from the region and locality of the project, should be taken into consideration.



Next Steps

- Share this process and work with the biomass industry
- Identify complimentary conservation values
- Update and implement conservation and biomass data
- Interpret results in ways that are useful to the biomass industry
- Identify lands to promote biomass extraction and development