



Using GIS to Map the Timeline of the American Frontier

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Background

- Pet academic project of mine for over 40 years.
- Mapping changes in population density.
- Paper maps and Mylar in the late 1960s.
- Used a blueprint set of historical county.
- My seminar students worked on various versions as GIS operations improved.
- Creating boundaries for counties in early censuses has always been the major problem.
- University of Minnesota released a new set of historical county maps as shapefiles and an associated database of county populations for each census decade 1790-2010.

Sources

Minnesota Population Center. National Historical Geographic Information System: Version 2.0. Minneapolis, MN: University of Minnesota 2011.

PURPOSE

- Outline methodology.
- Discussion of results.
- Summarize what results tell us.

Frontier

What does it mean?



The Significance of the Frontier in American History

- Frederick Jackson Turner
- Public Lecture at Chicago World's Fair in 1893
- Salient feature of American intellectual life for 100 years
- Turner suggested a quantitative definition
- Six people per square mile isopleth
- This study uses 10 people per square mile

Qualitative/Literary definitions

- **Boundary between civilization and wilderness**
- **Boundary between the steppe and the sown**
- **Edge of cultivation**
- **Edge between Europeans and First Peoples**

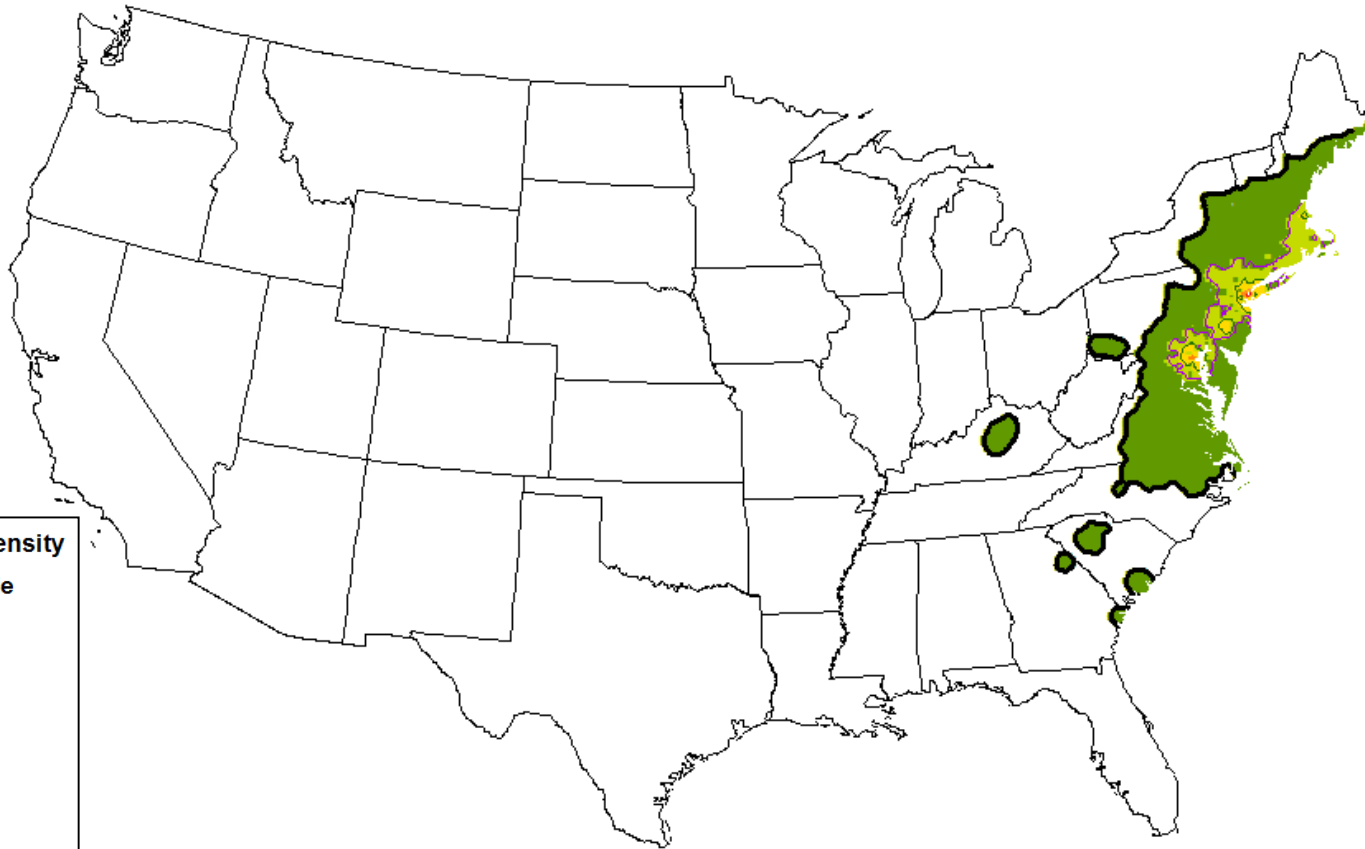
Methodology

- Calculate centroids of county polygons for each census decade.
- Calculate county areas (square miles)
- Join to population database
- Calculate population per square mile for each census year point file.
- Use Spatial Analyst to create an interpolated surface of density per square mile
- Create a grid surface and contours for visualization
- Generate animations for better visualization
- Caveat – centroids of larger western counties may not correspond to population clusters.

This Presentation

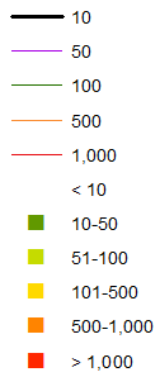
- Map by map excursion through time
- Highlight changes over time
- Discuss the openings and barriers revealed in the maps
- Demonstrate the historical importance of the 20” isohyet
- Mark the persistent edge of the “cultivation” frontier
- Illuminate the importance of “urban” frontiers in the west in the 20th – 21st centuries.

1790

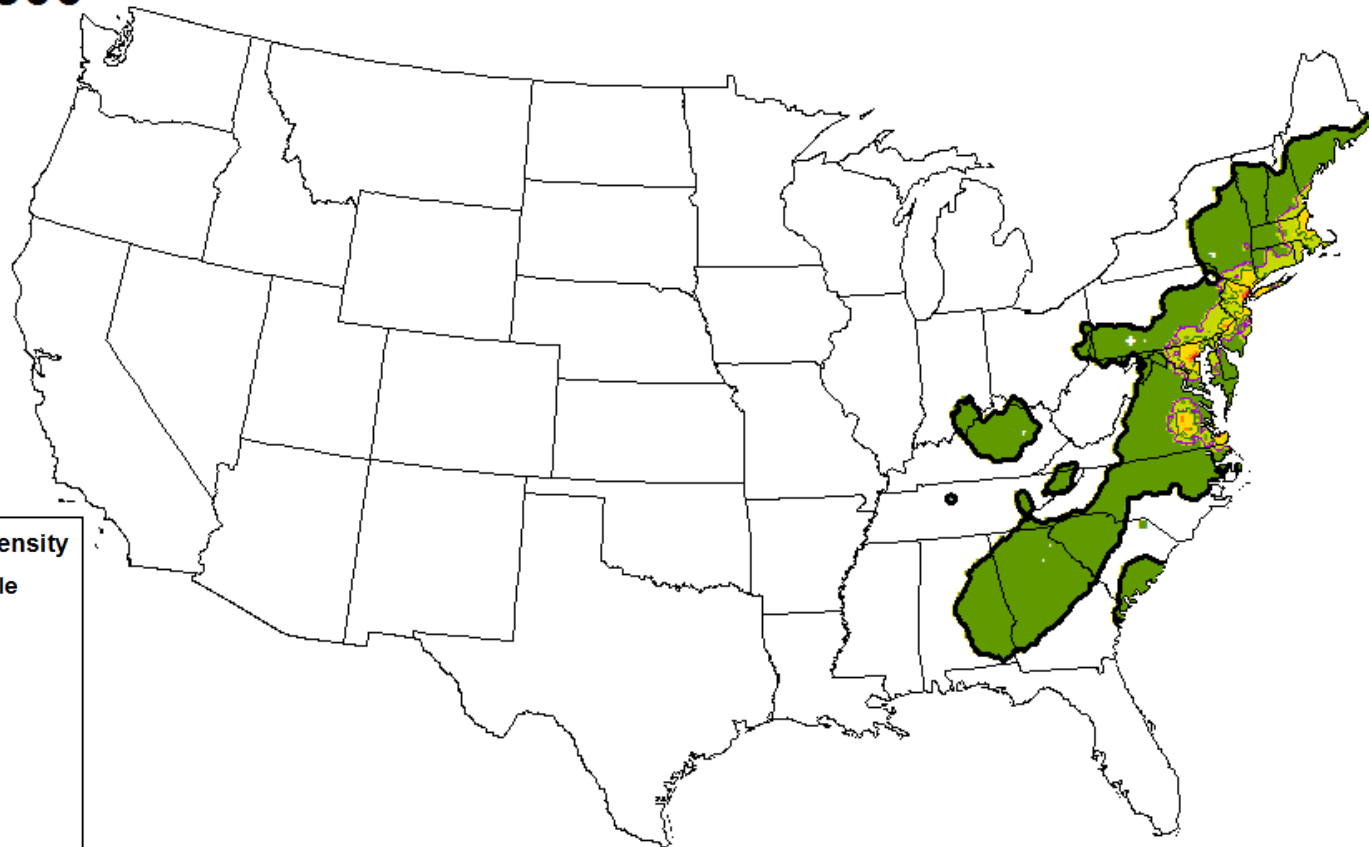


Population Density

Per square mile














1800

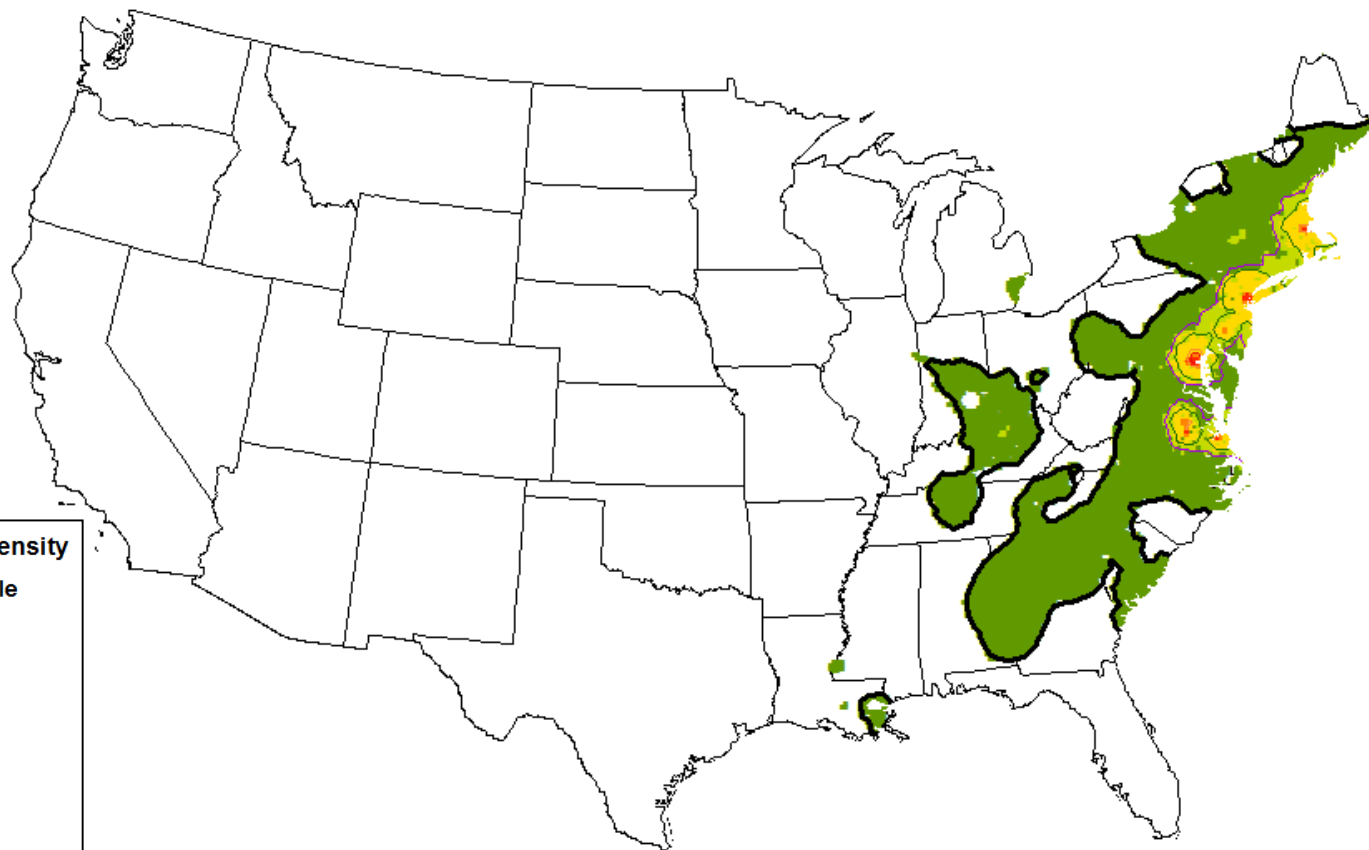


Population Density

Per square mile

-  10
-  50
-  100
-  500
-  1,000
-  < 10
-  10-50
-  51-100
-  101-500
-  500-1,000
-  > 1,000

1810

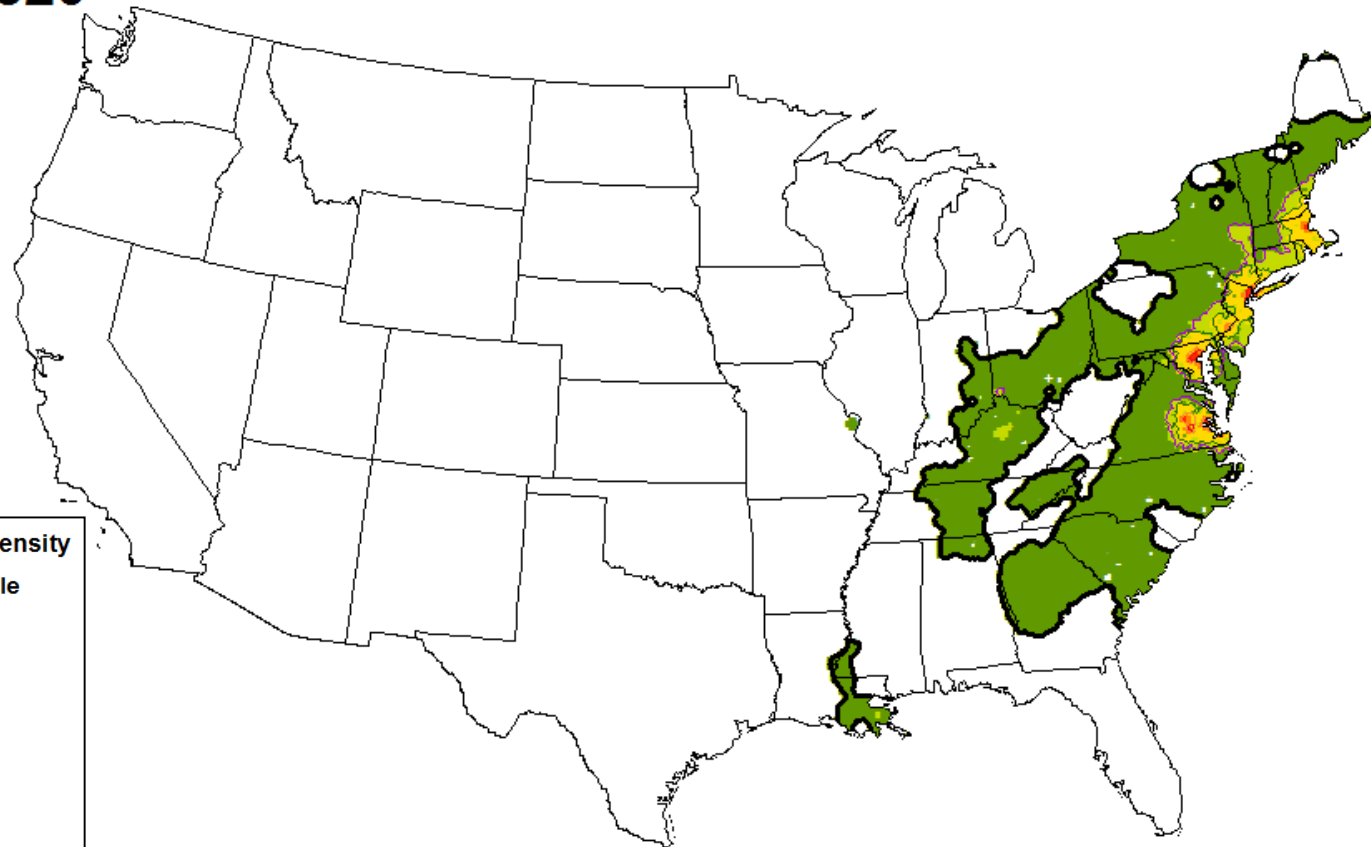


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1820

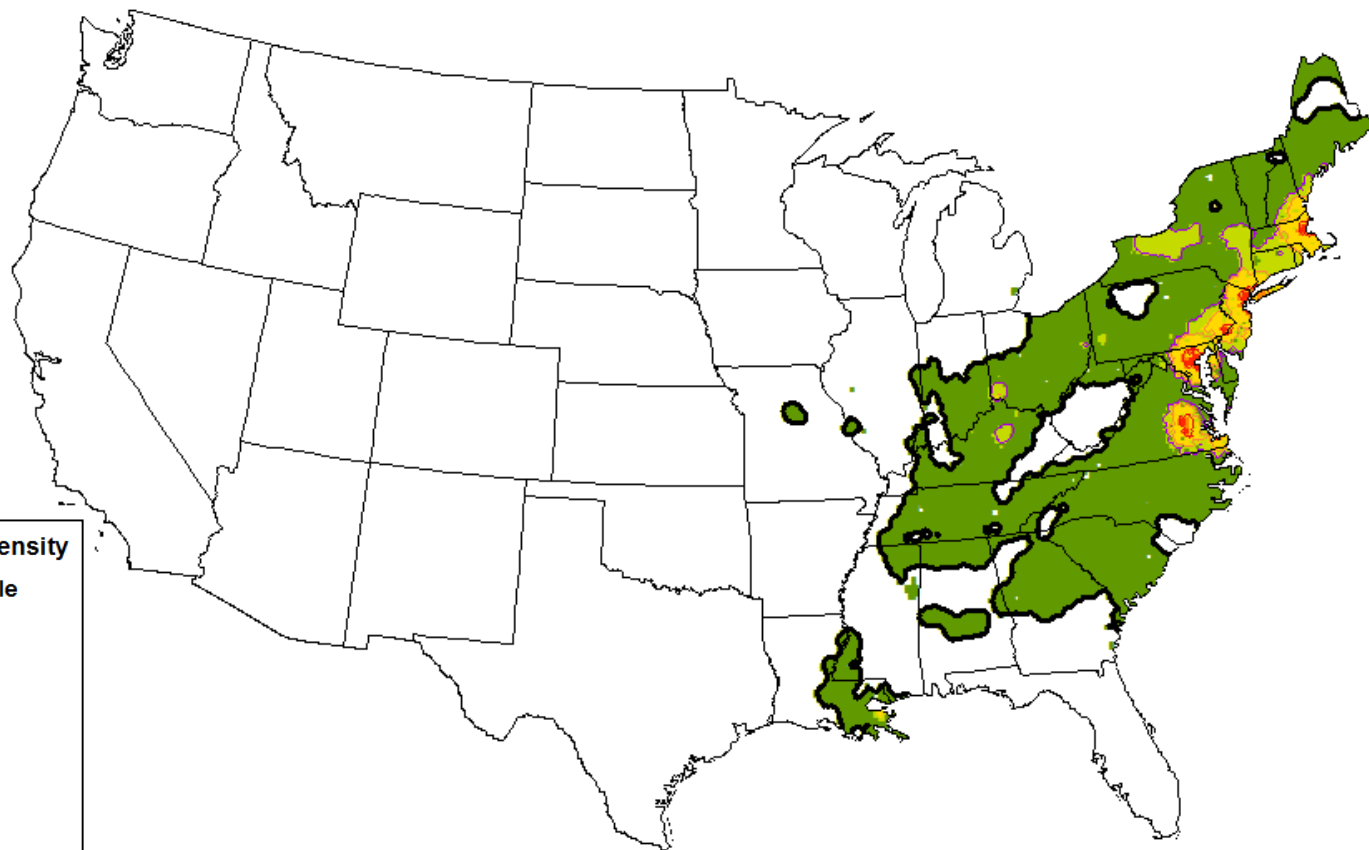


Population Density

Per square mile












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1830

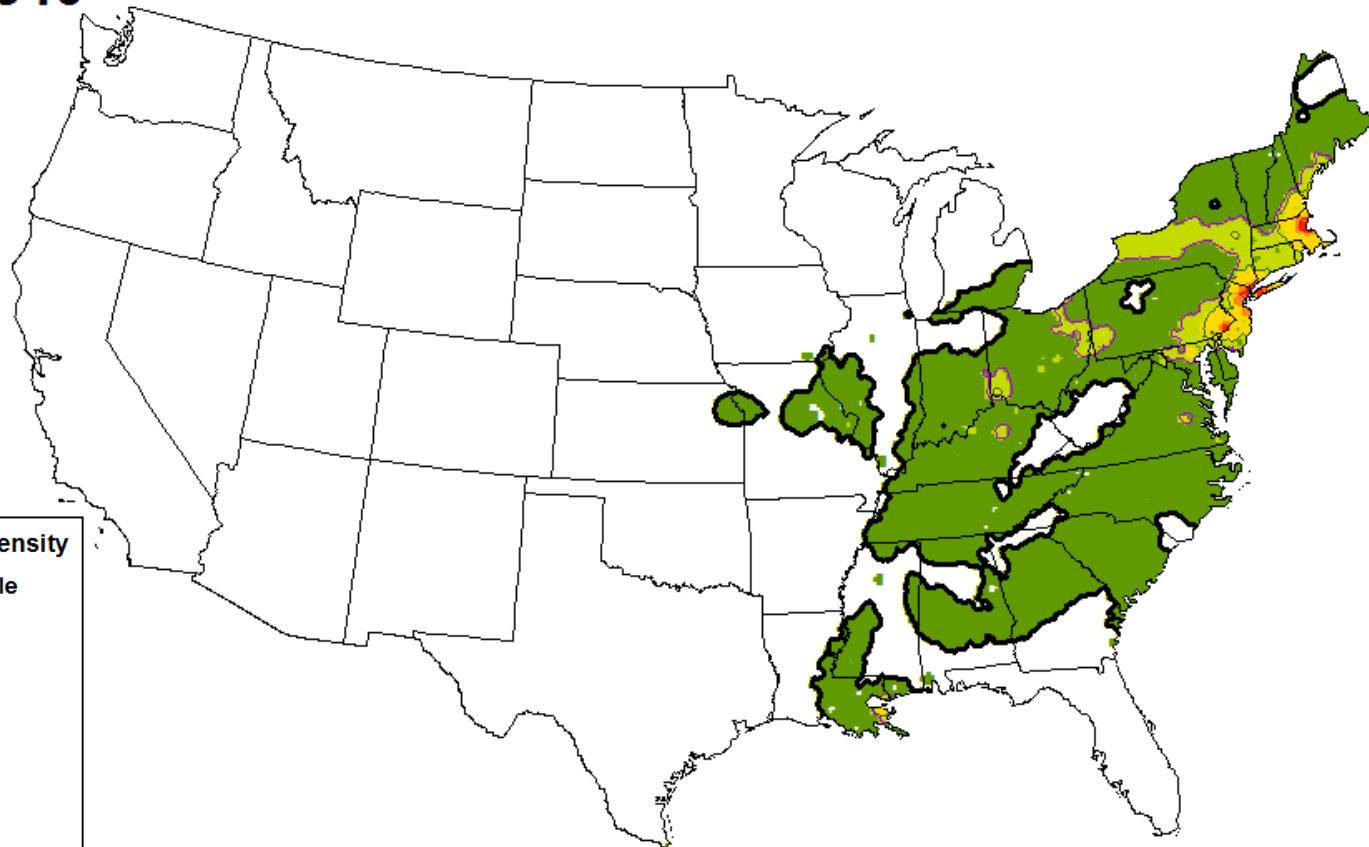


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1840

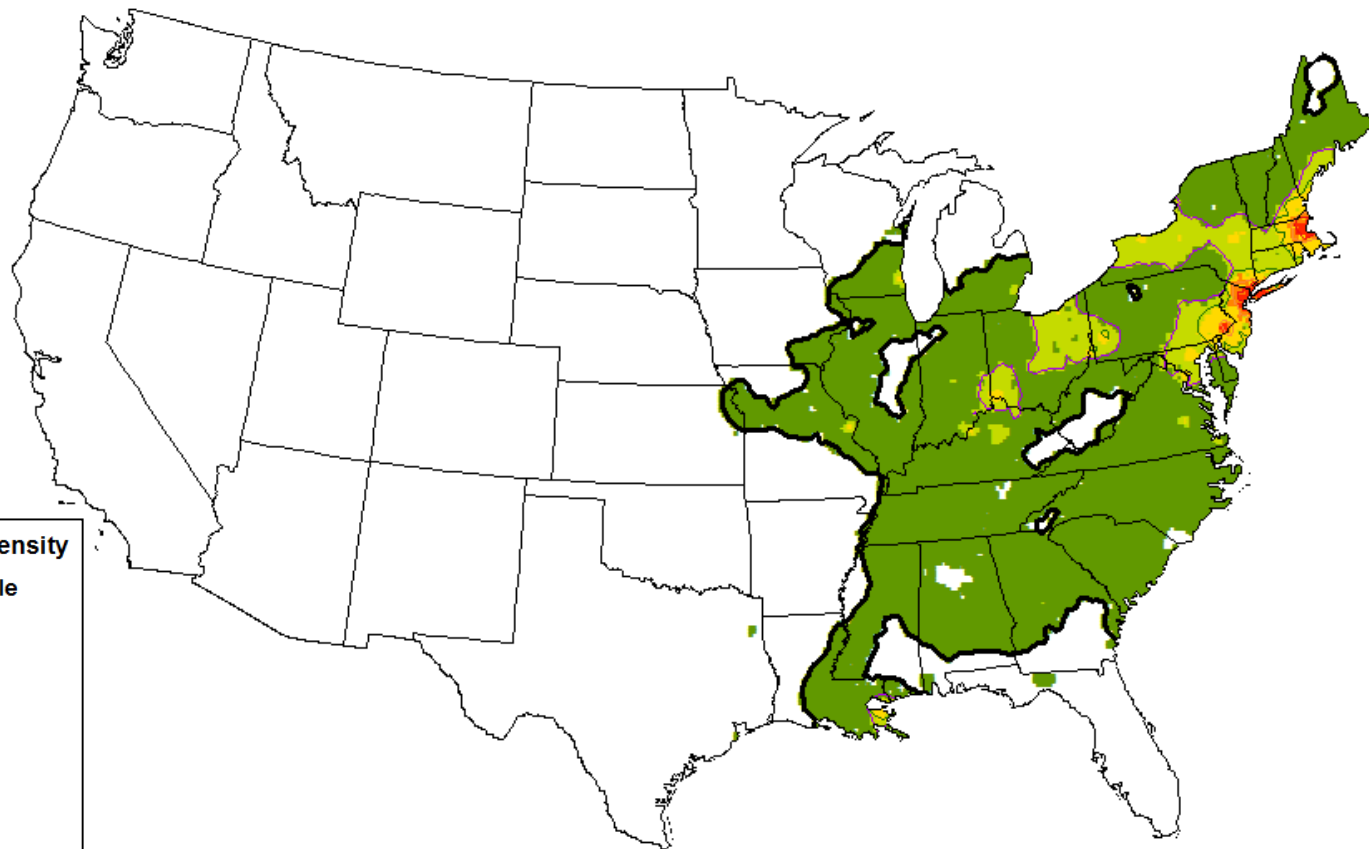


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1850

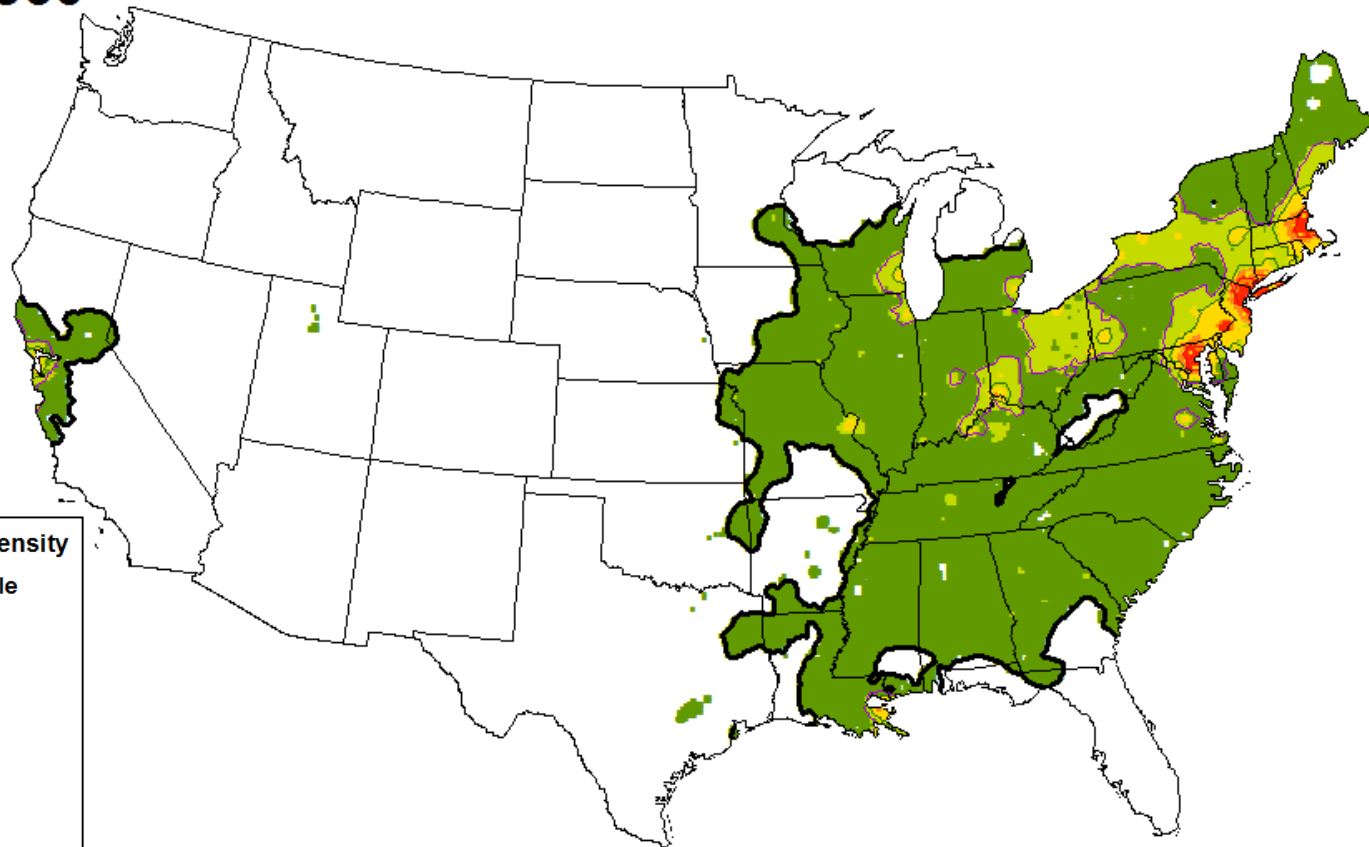


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1860

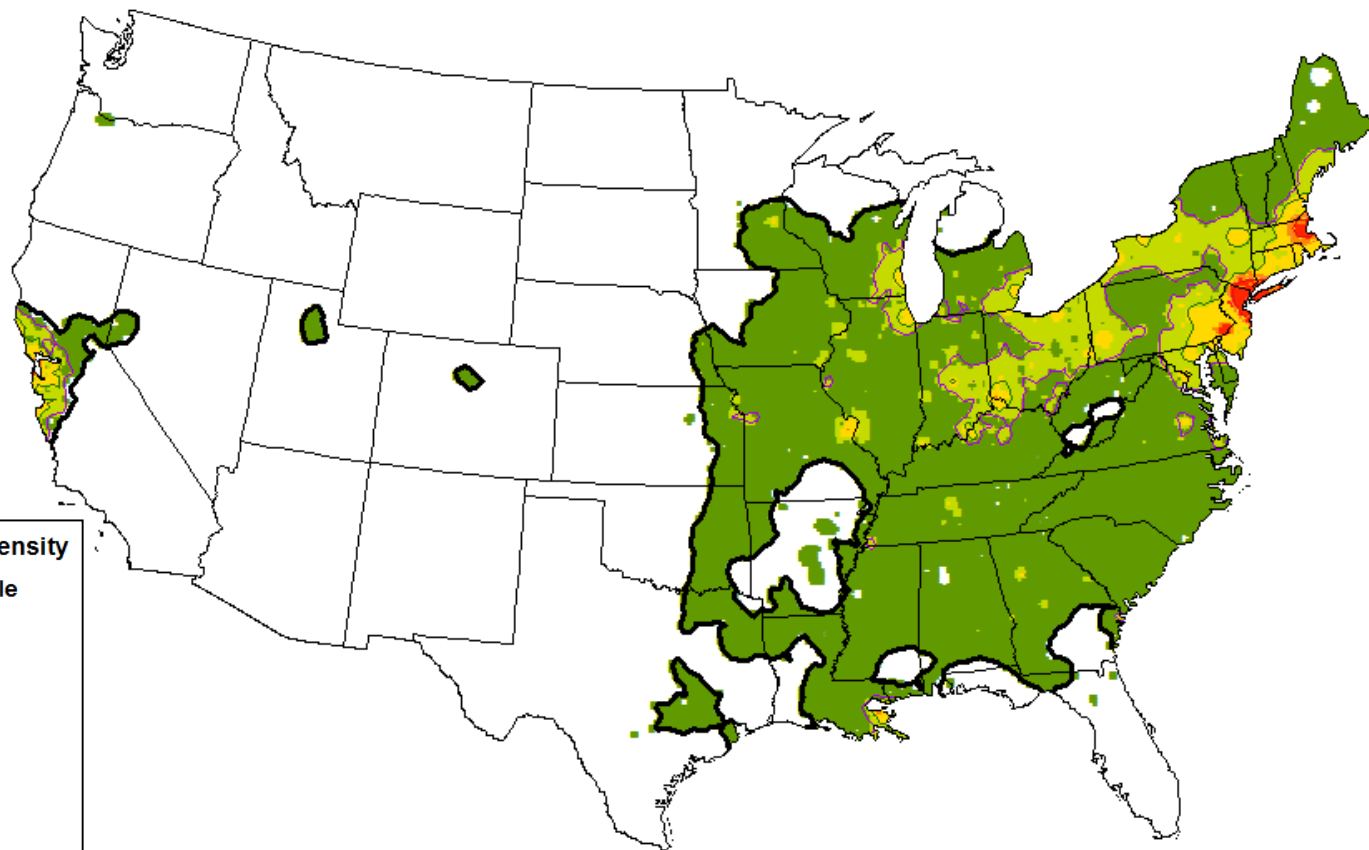


Population Density

Per square mile

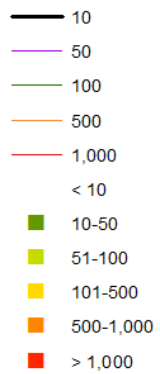
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1870

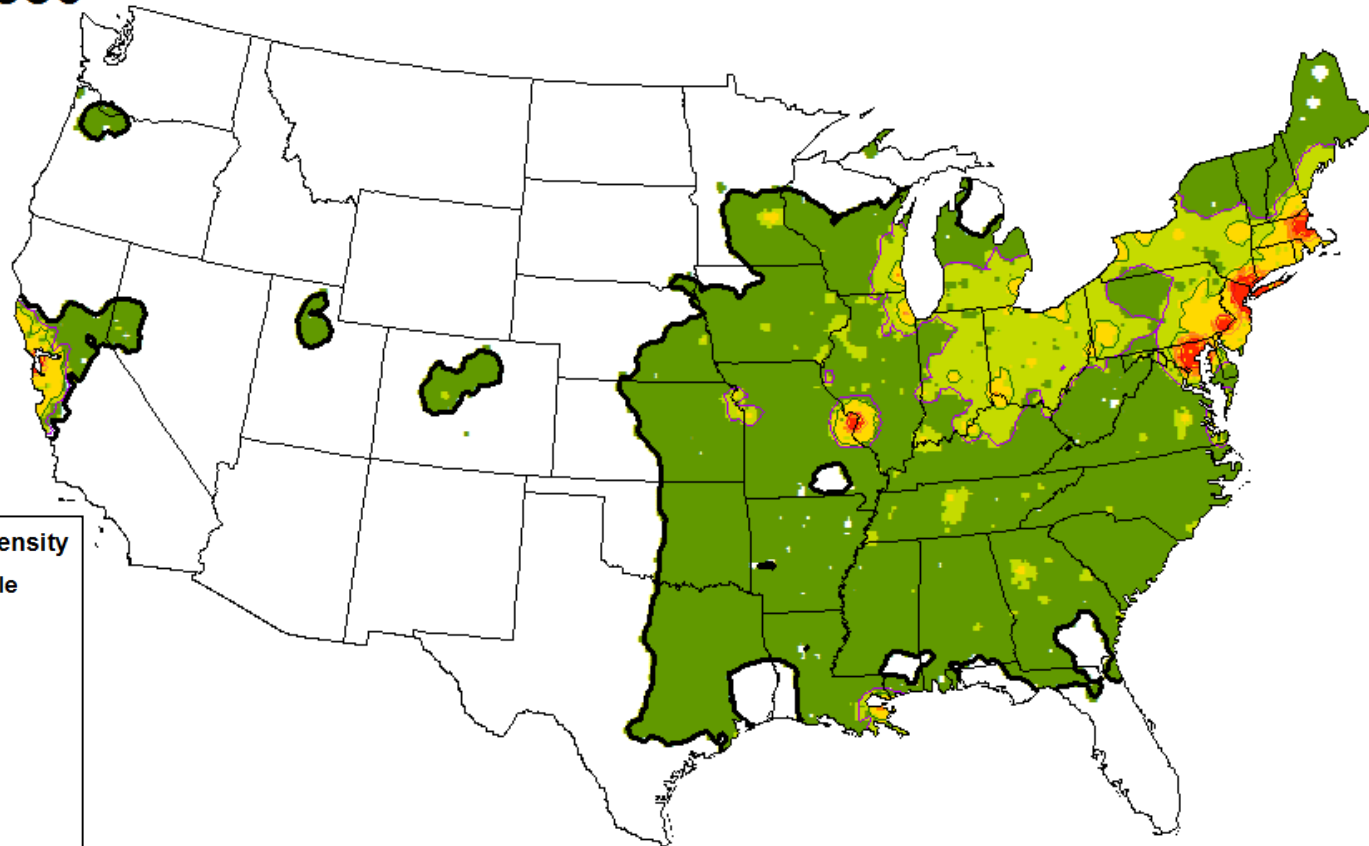


Population Density

Per square mile



1880

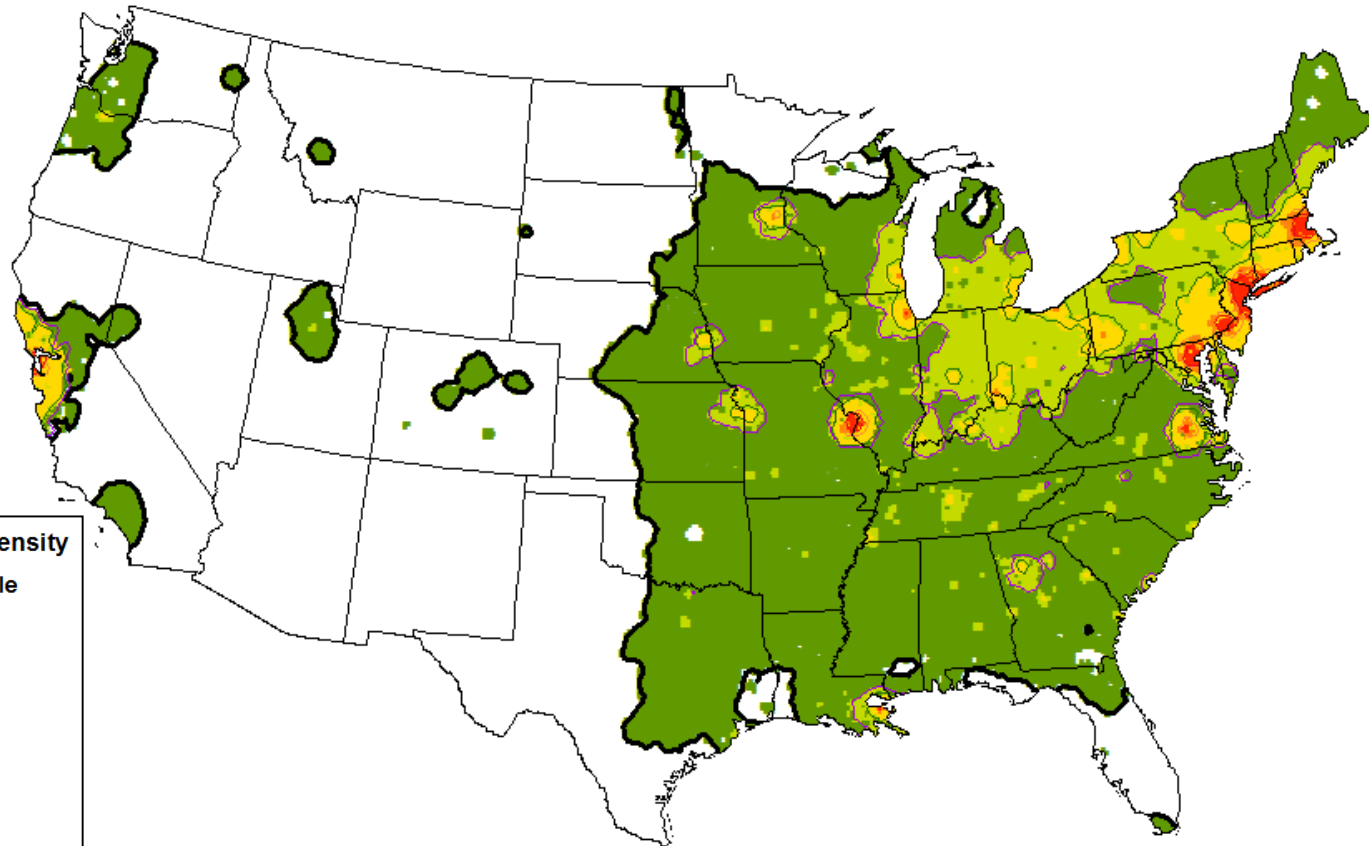


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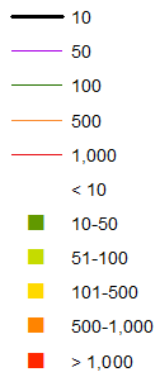
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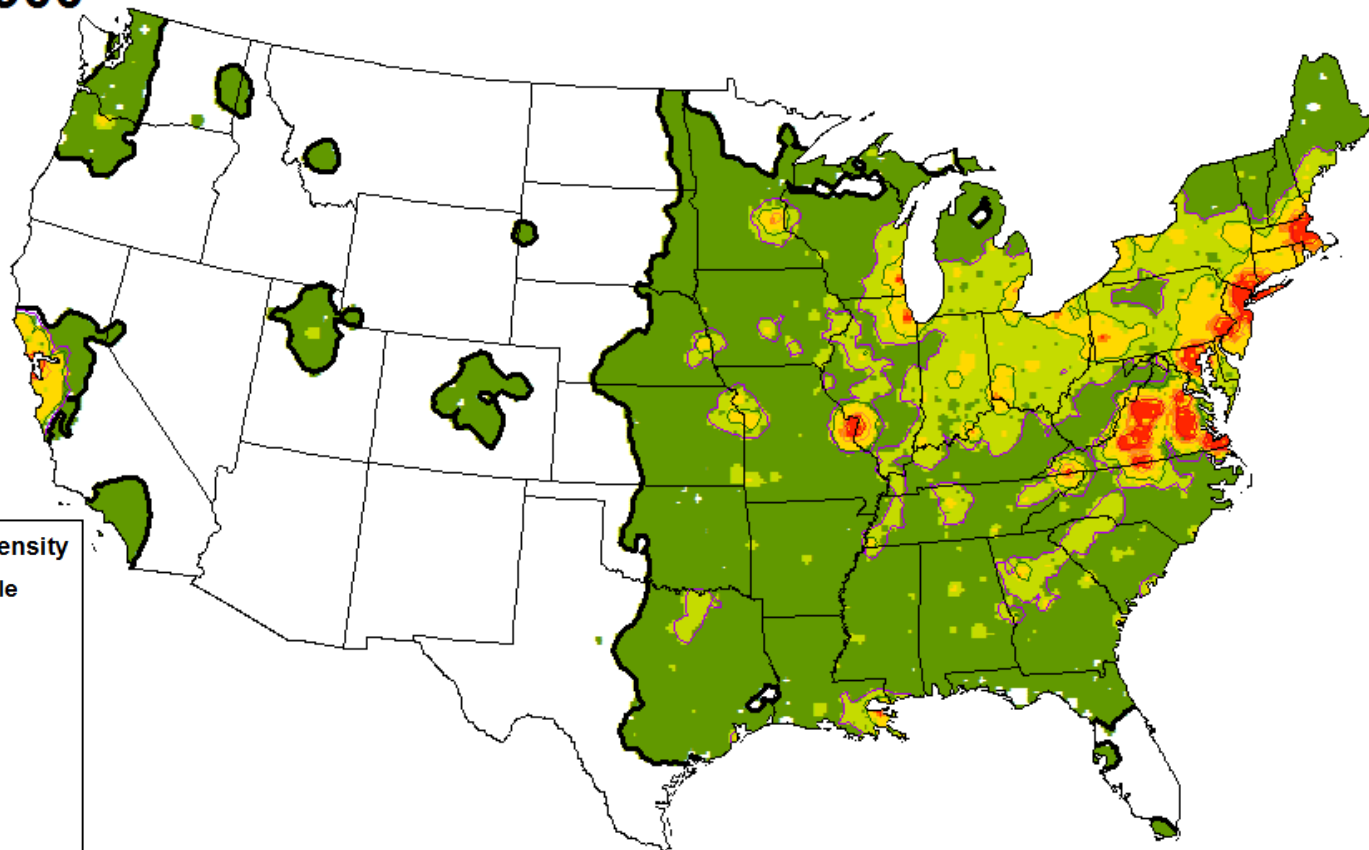


Population Density

Per square mile



1900

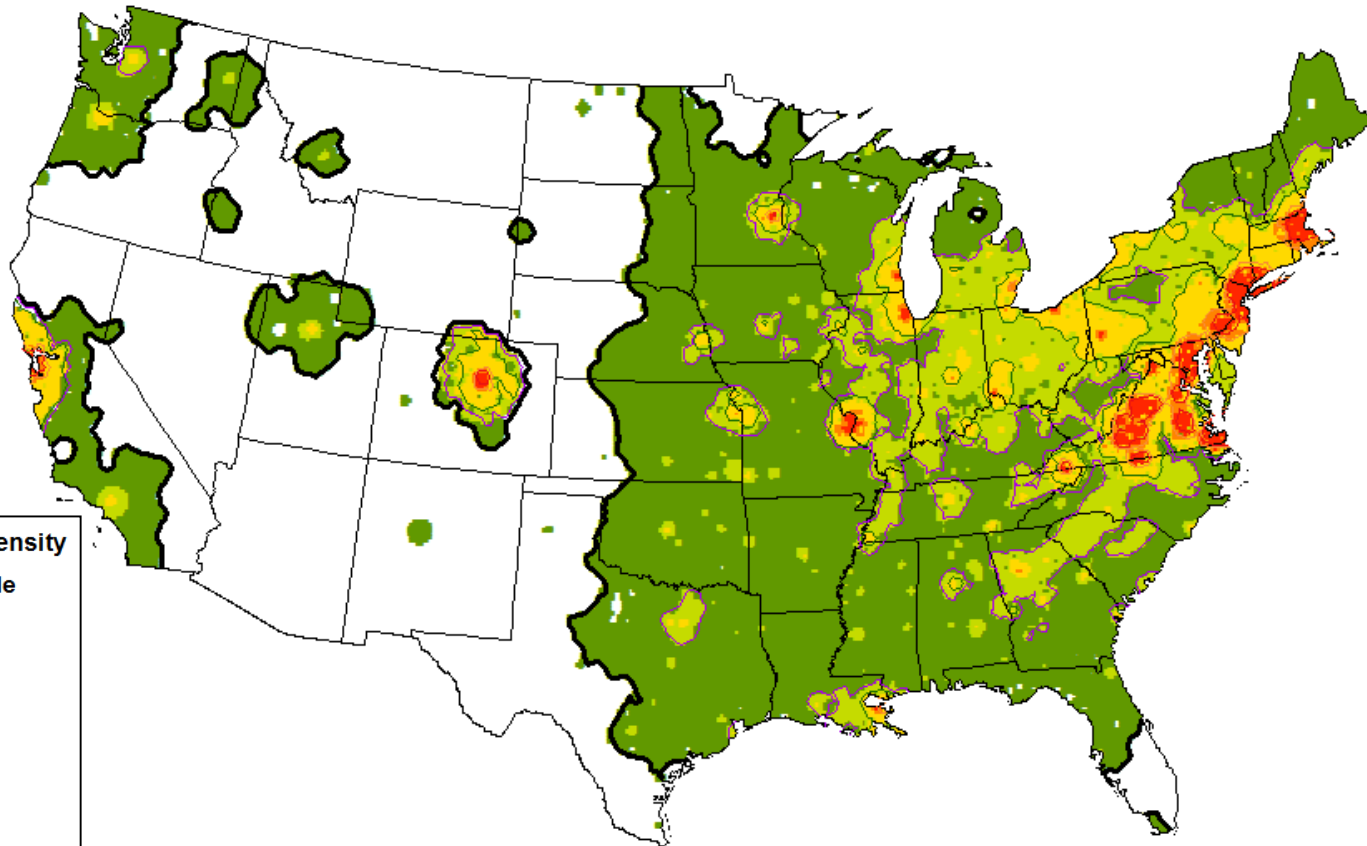


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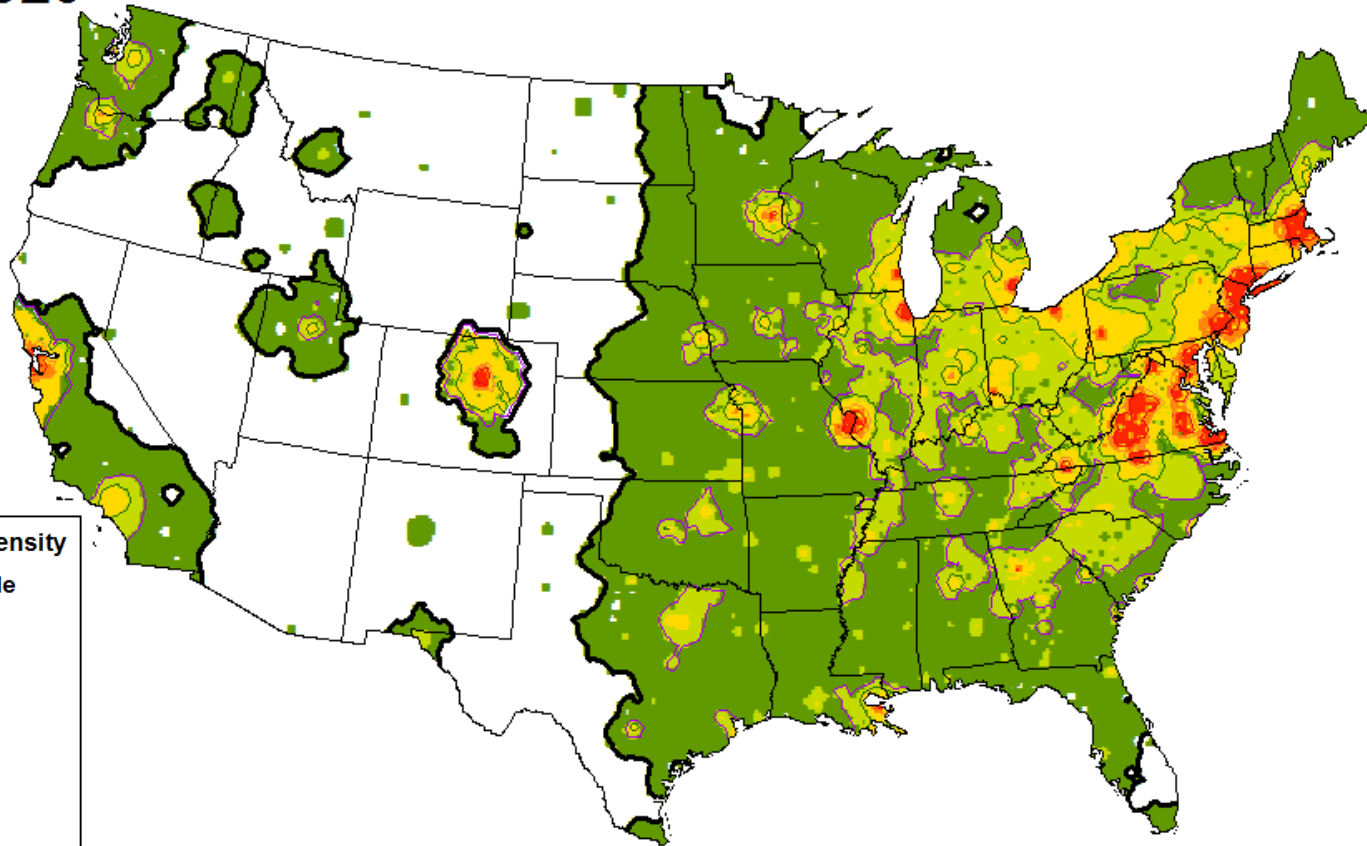


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1920

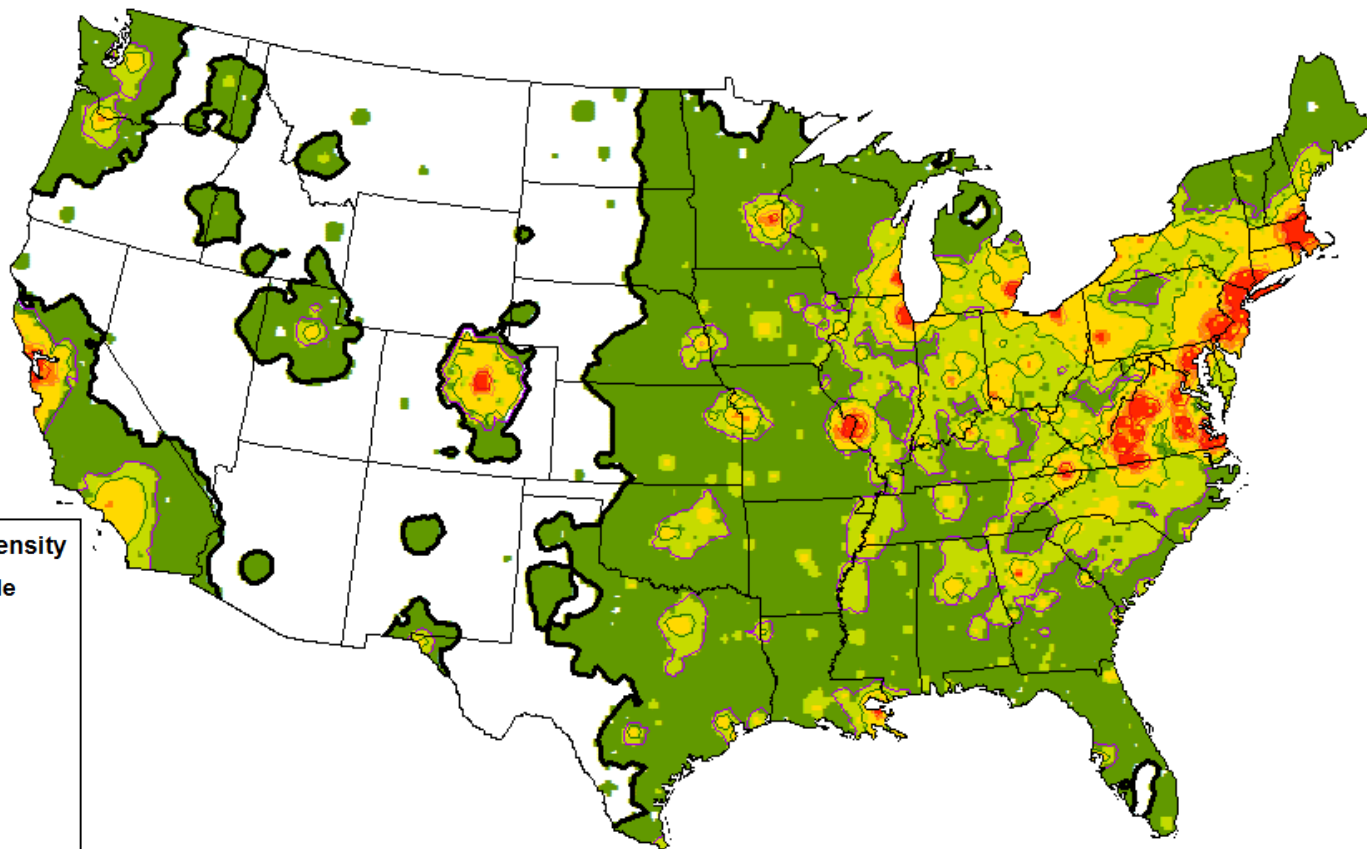


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1930

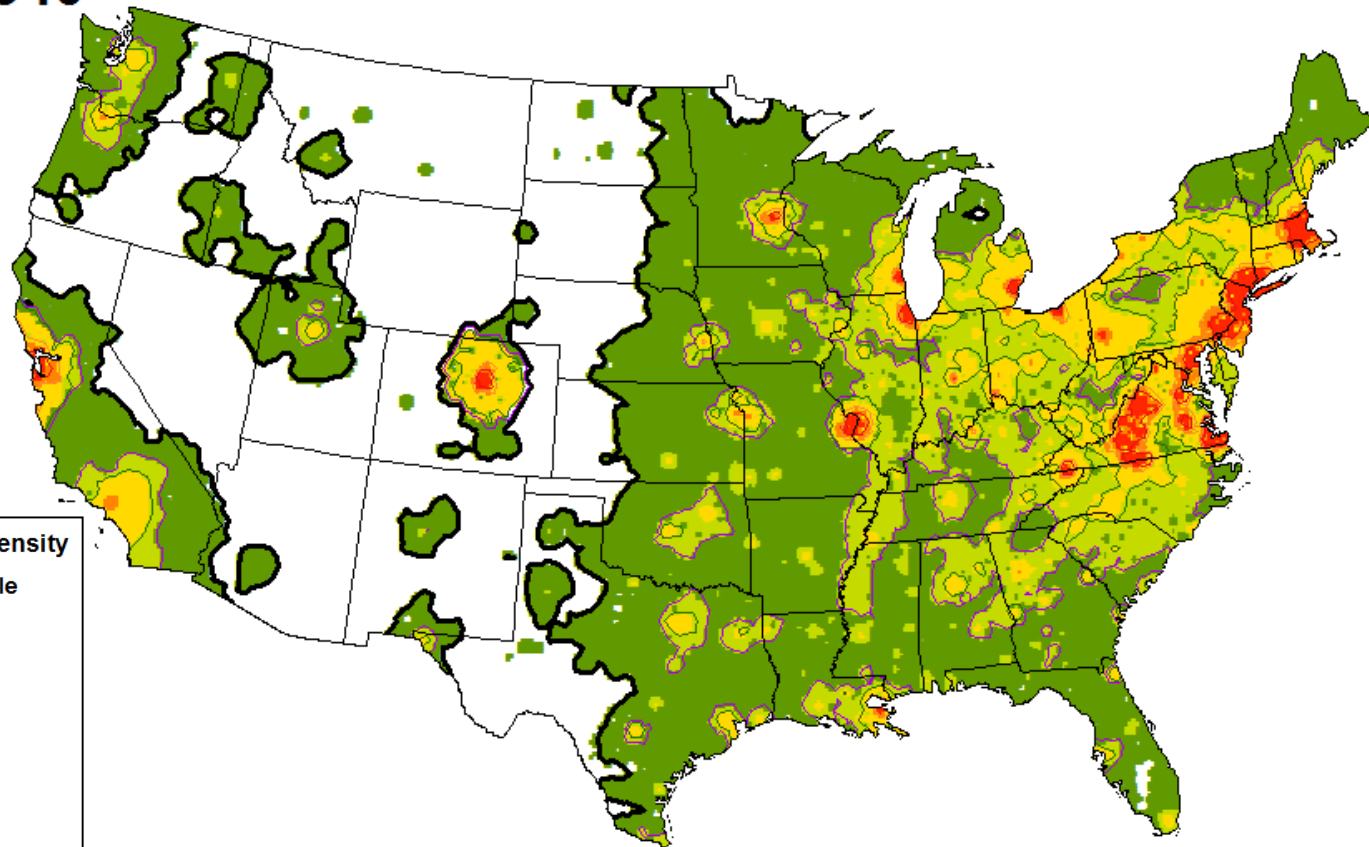


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1940

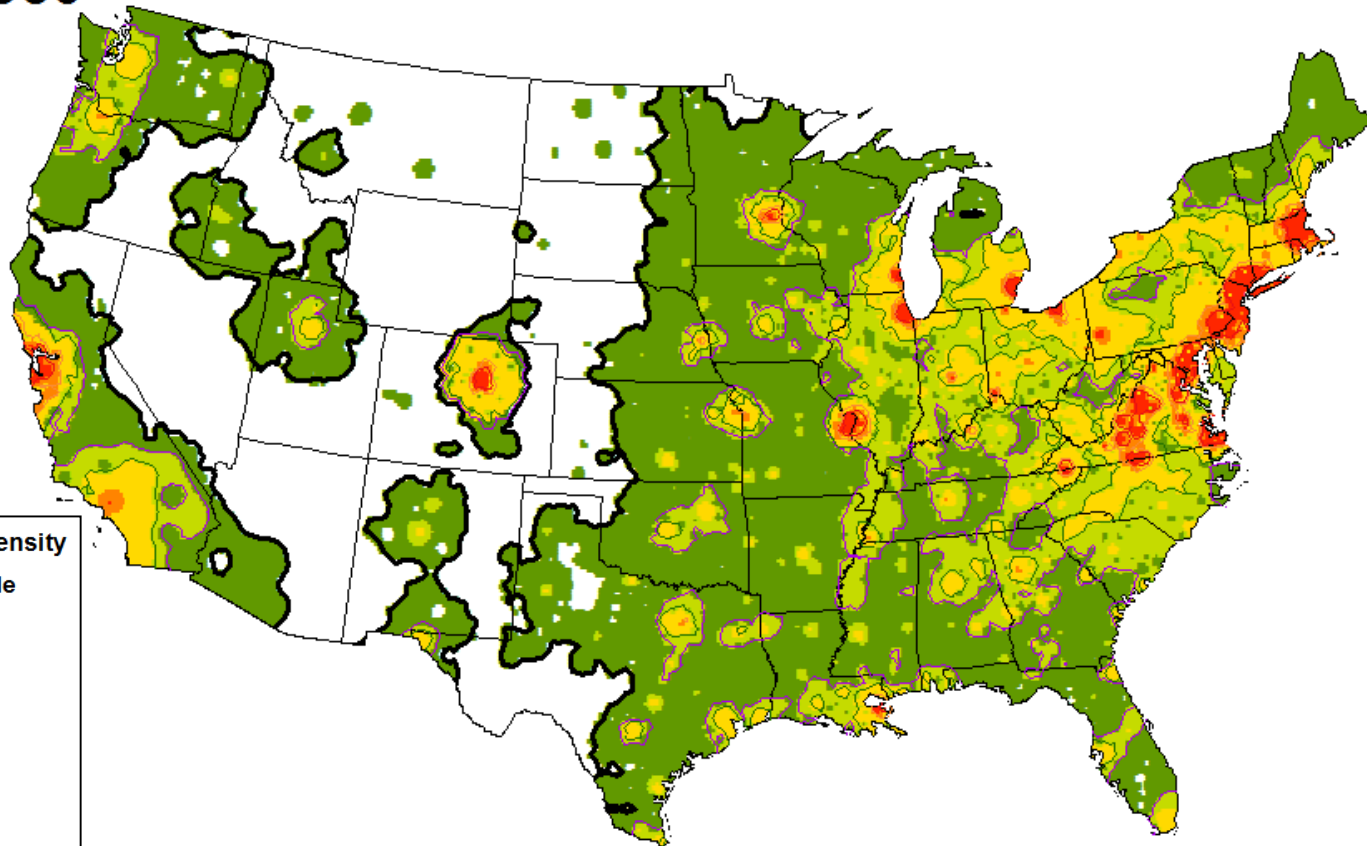


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1950

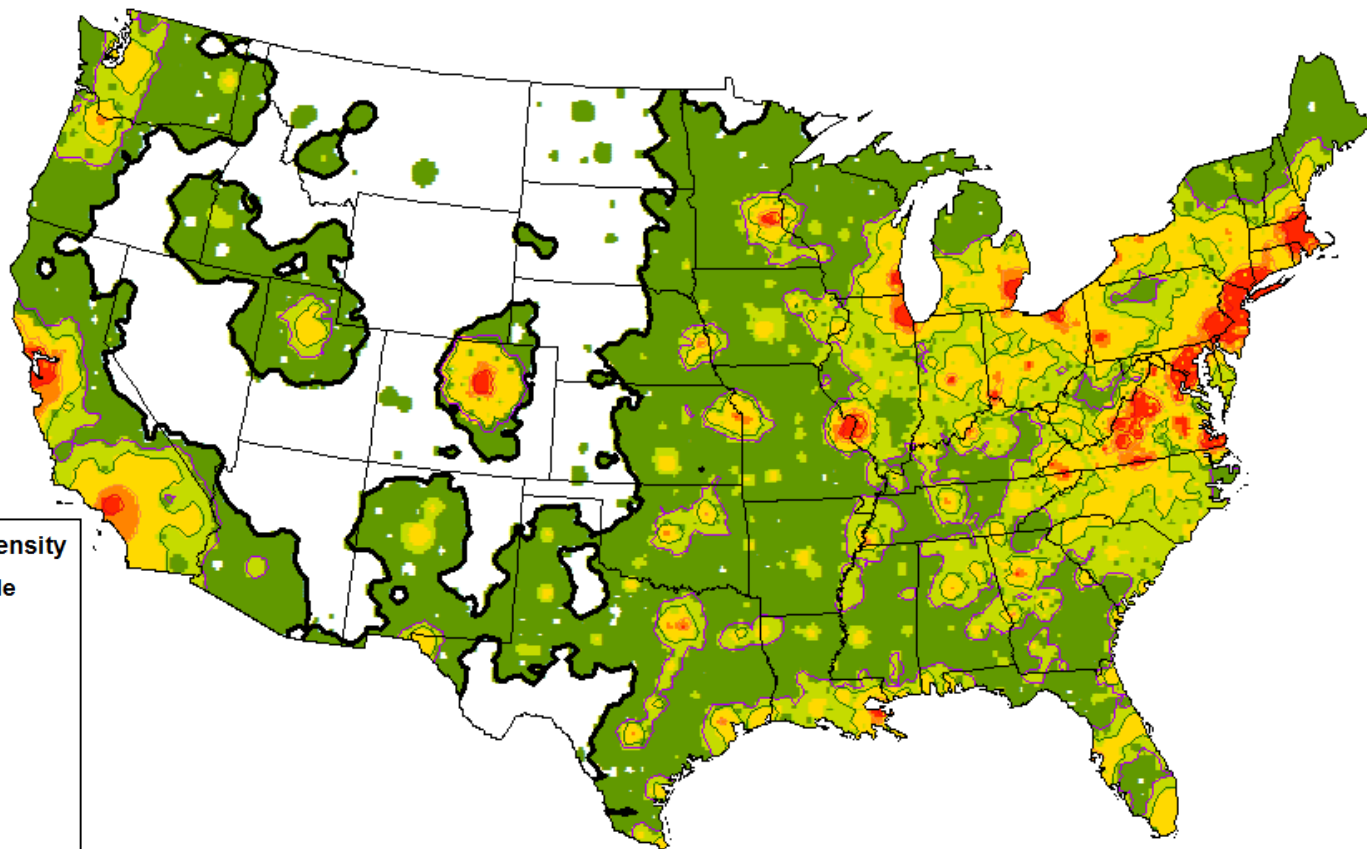


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1960

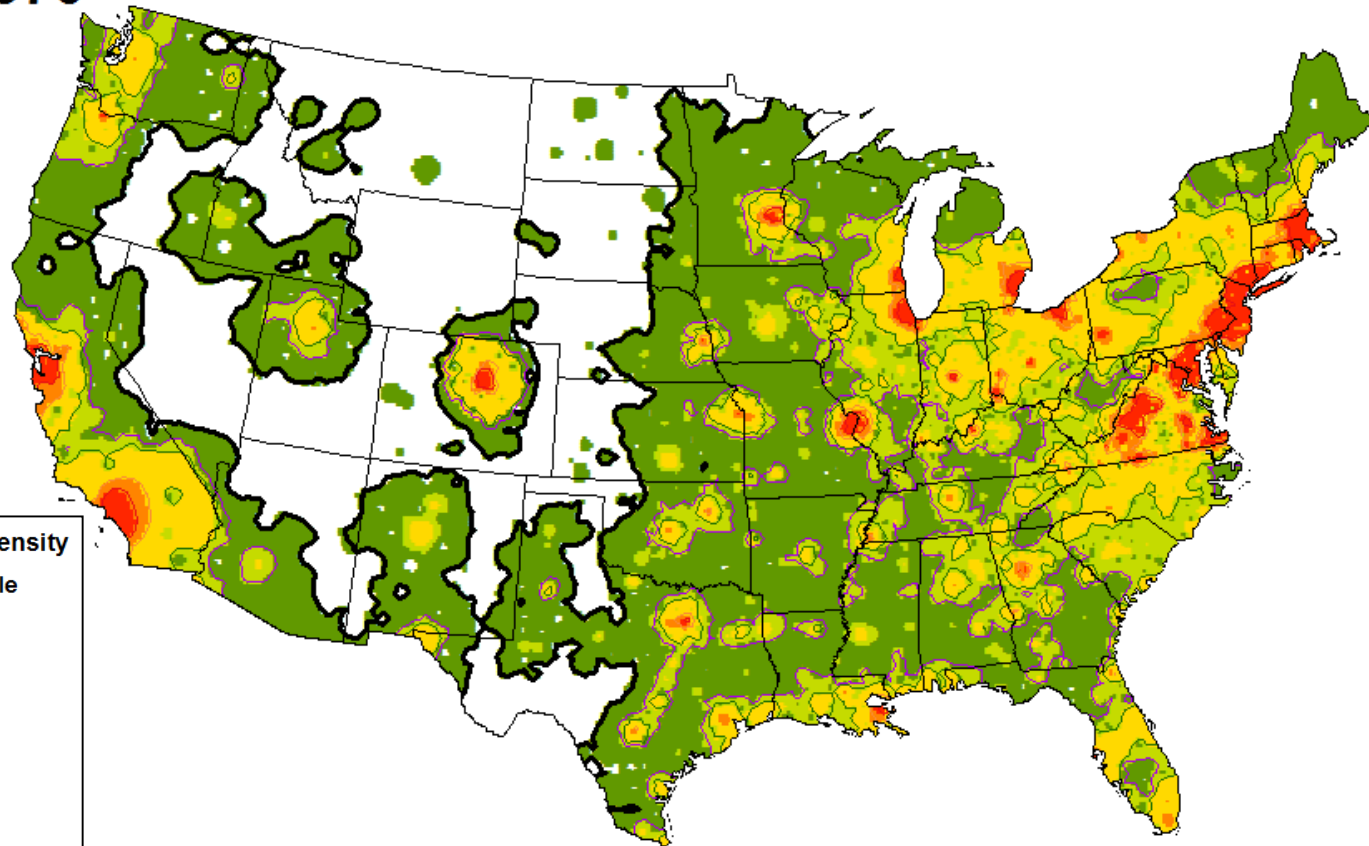


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1970

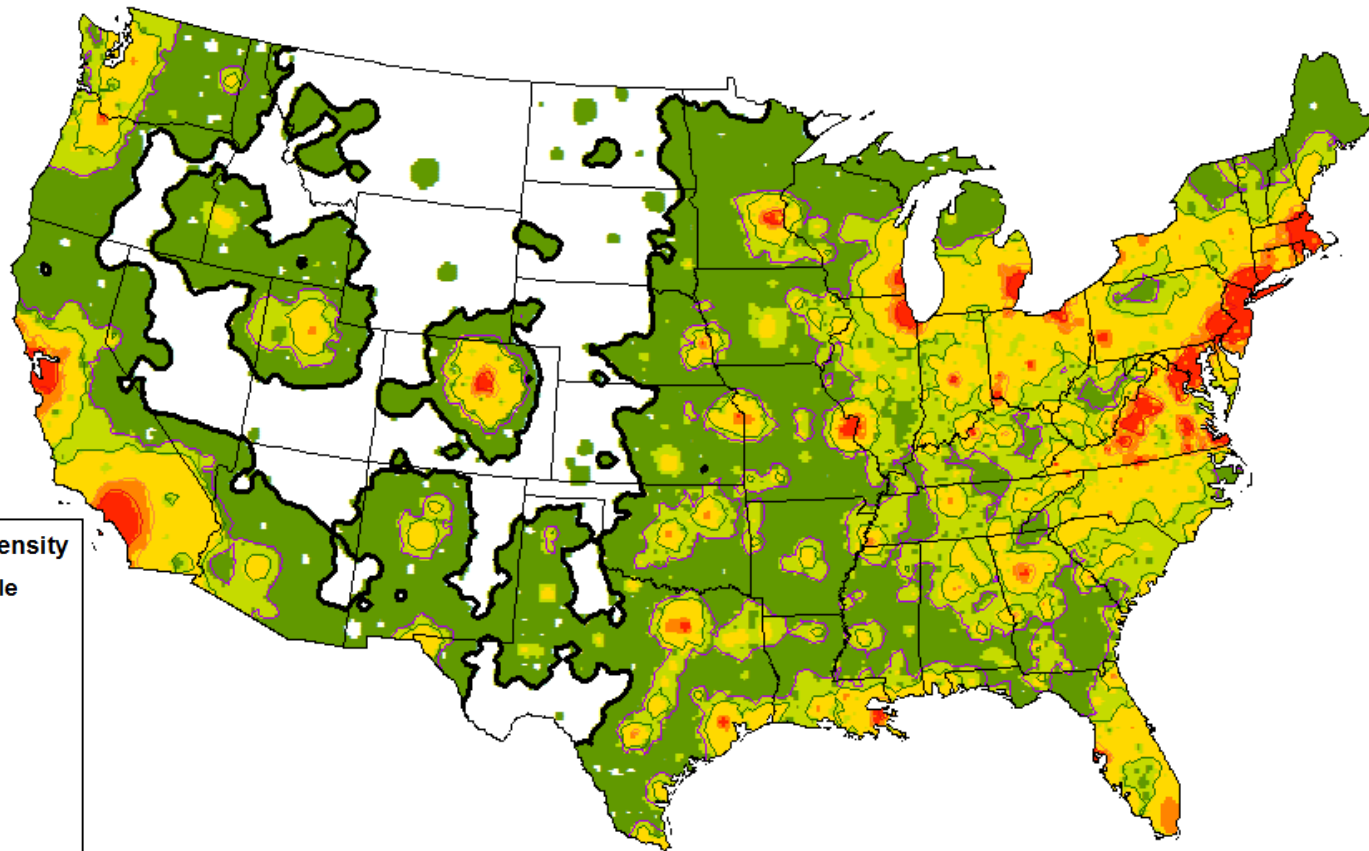


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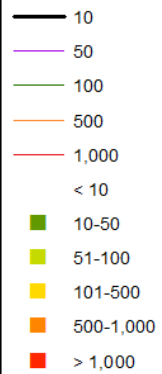
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1980

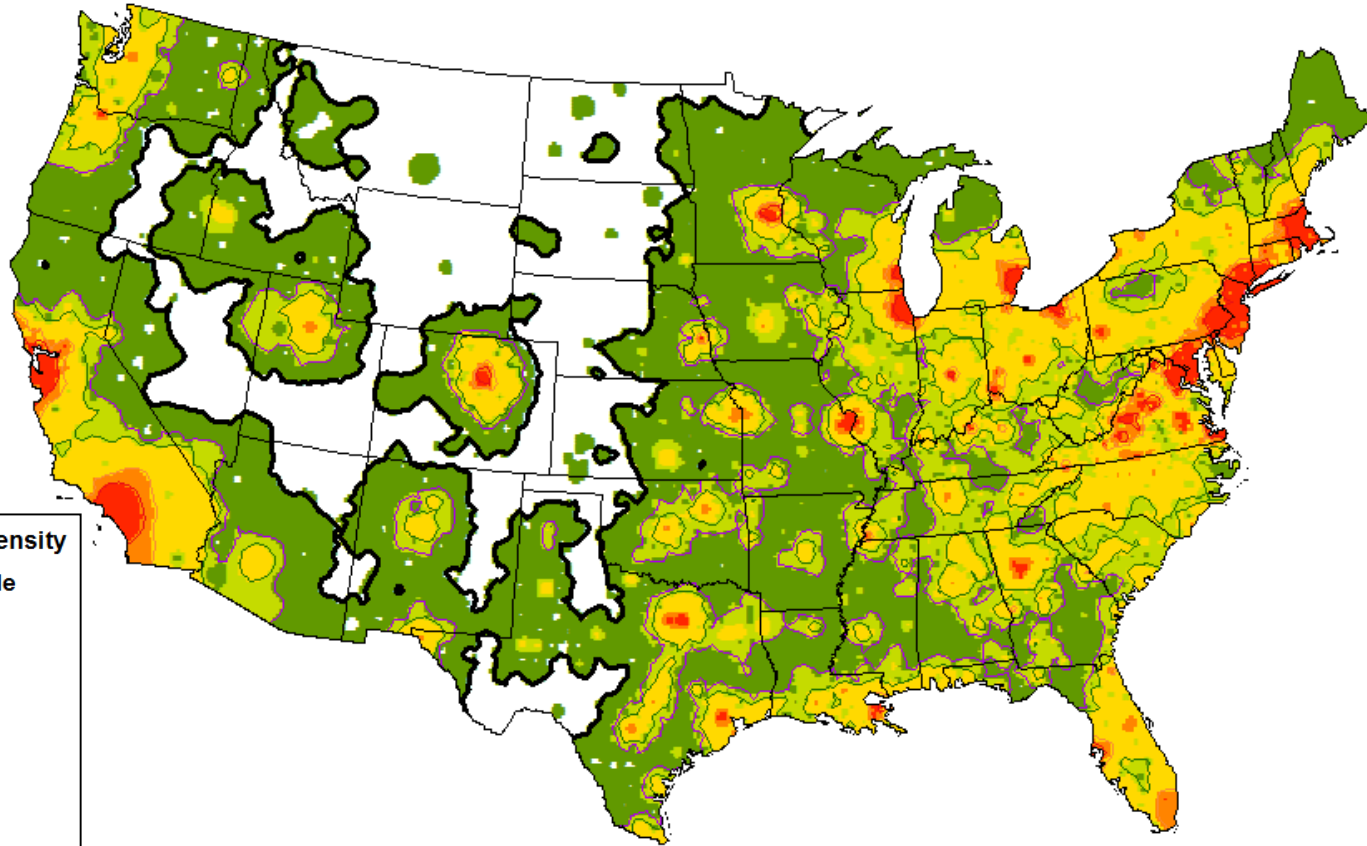


Population Density

Per square mile



1990

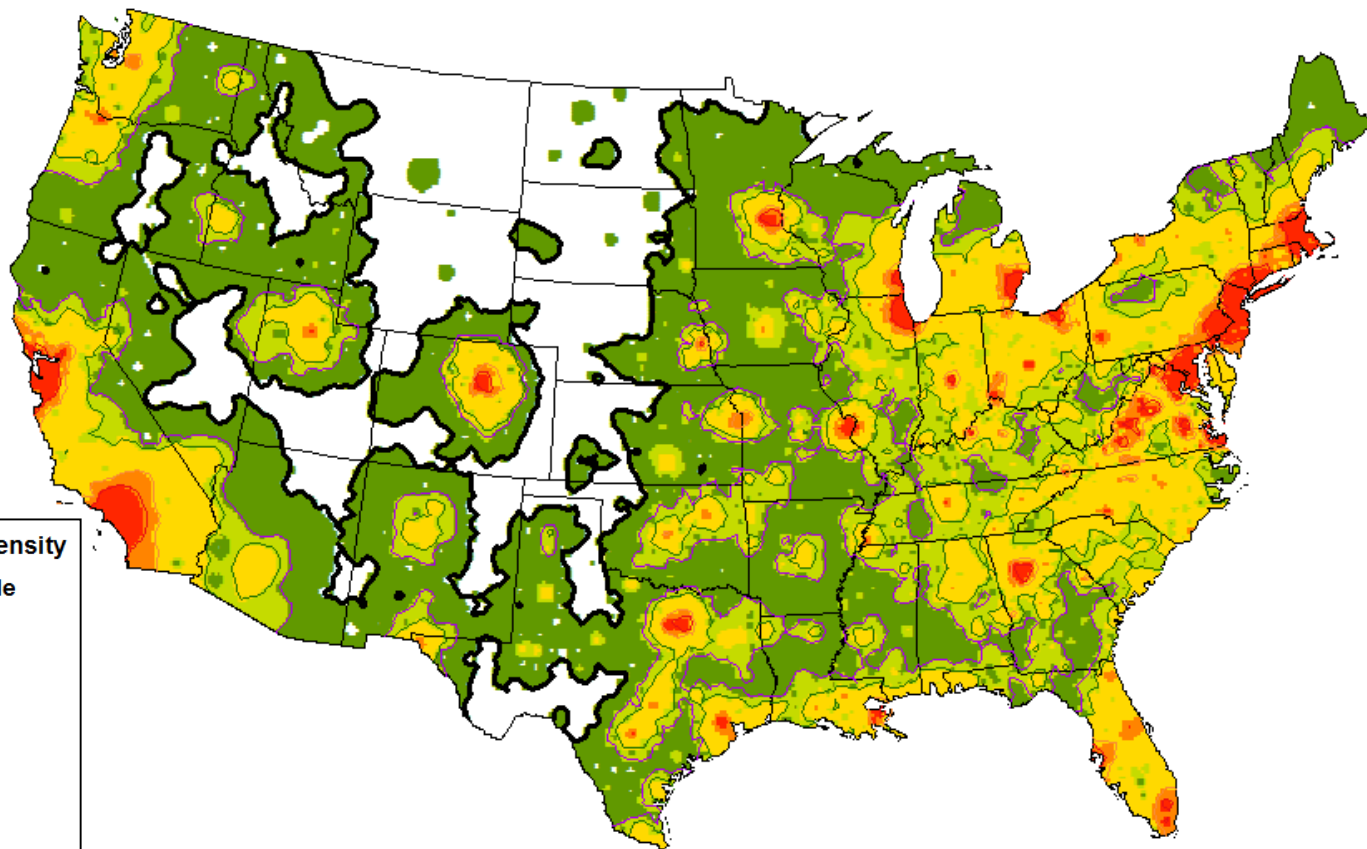


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2000

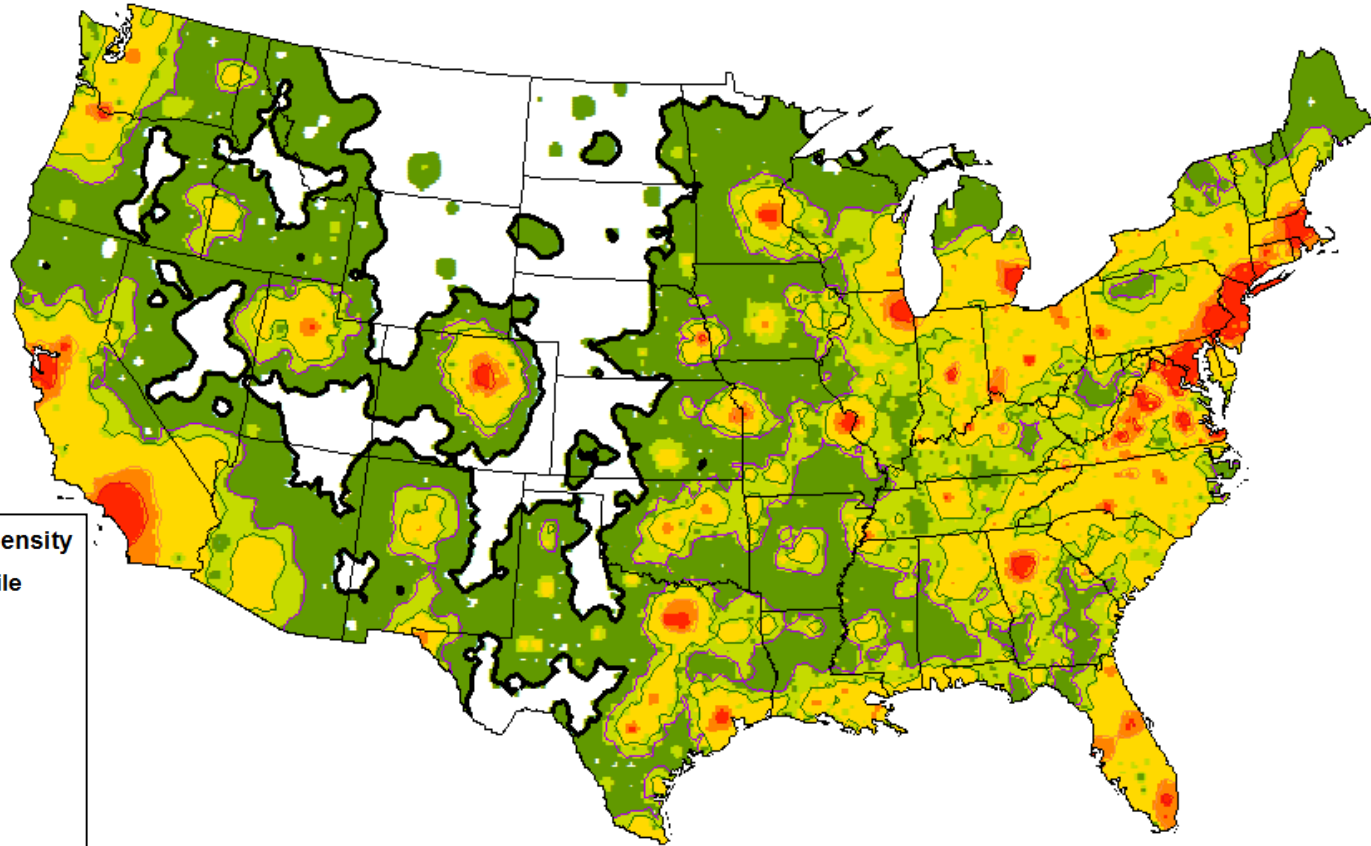


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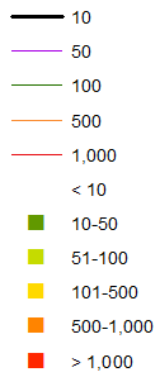
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2010

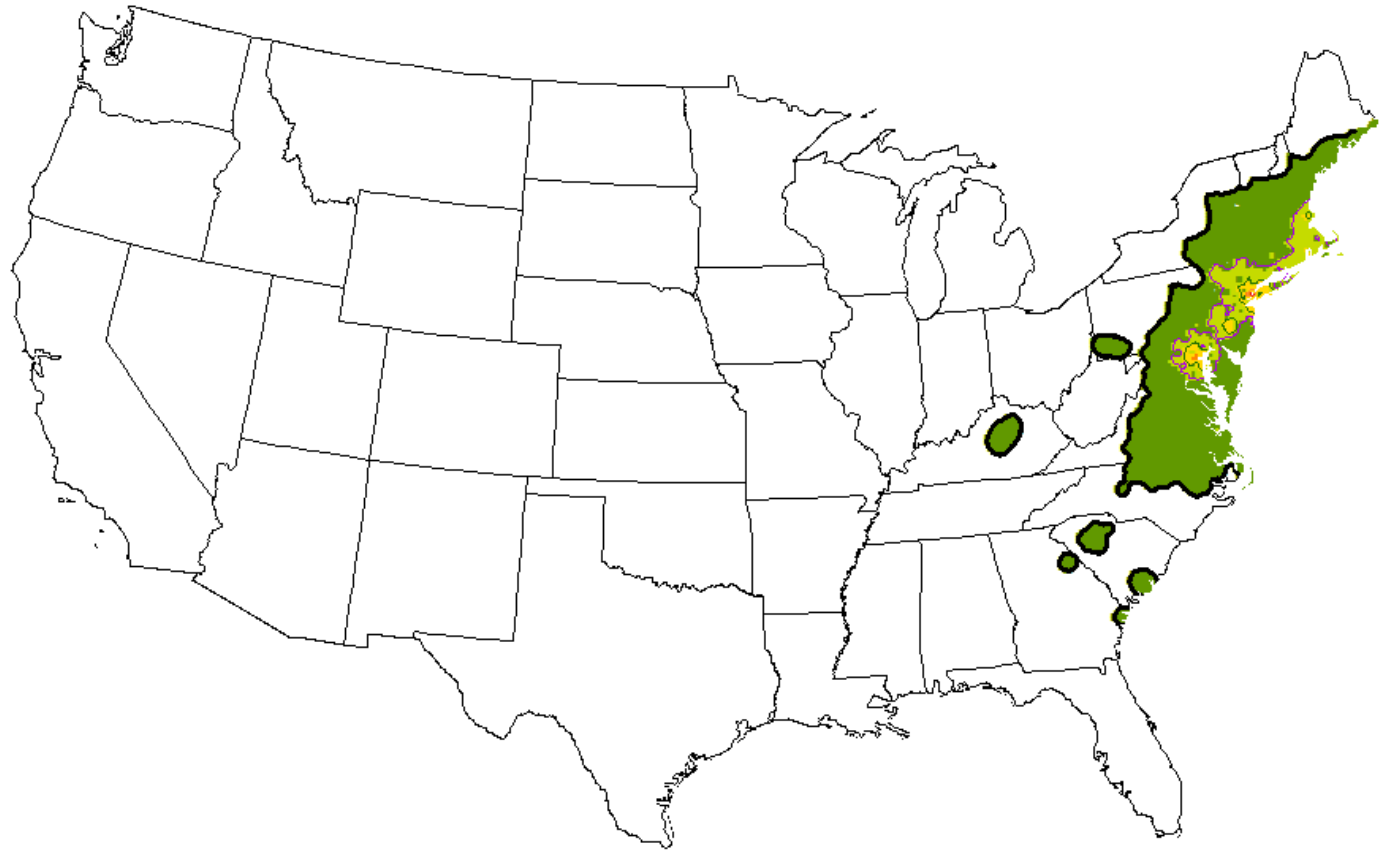


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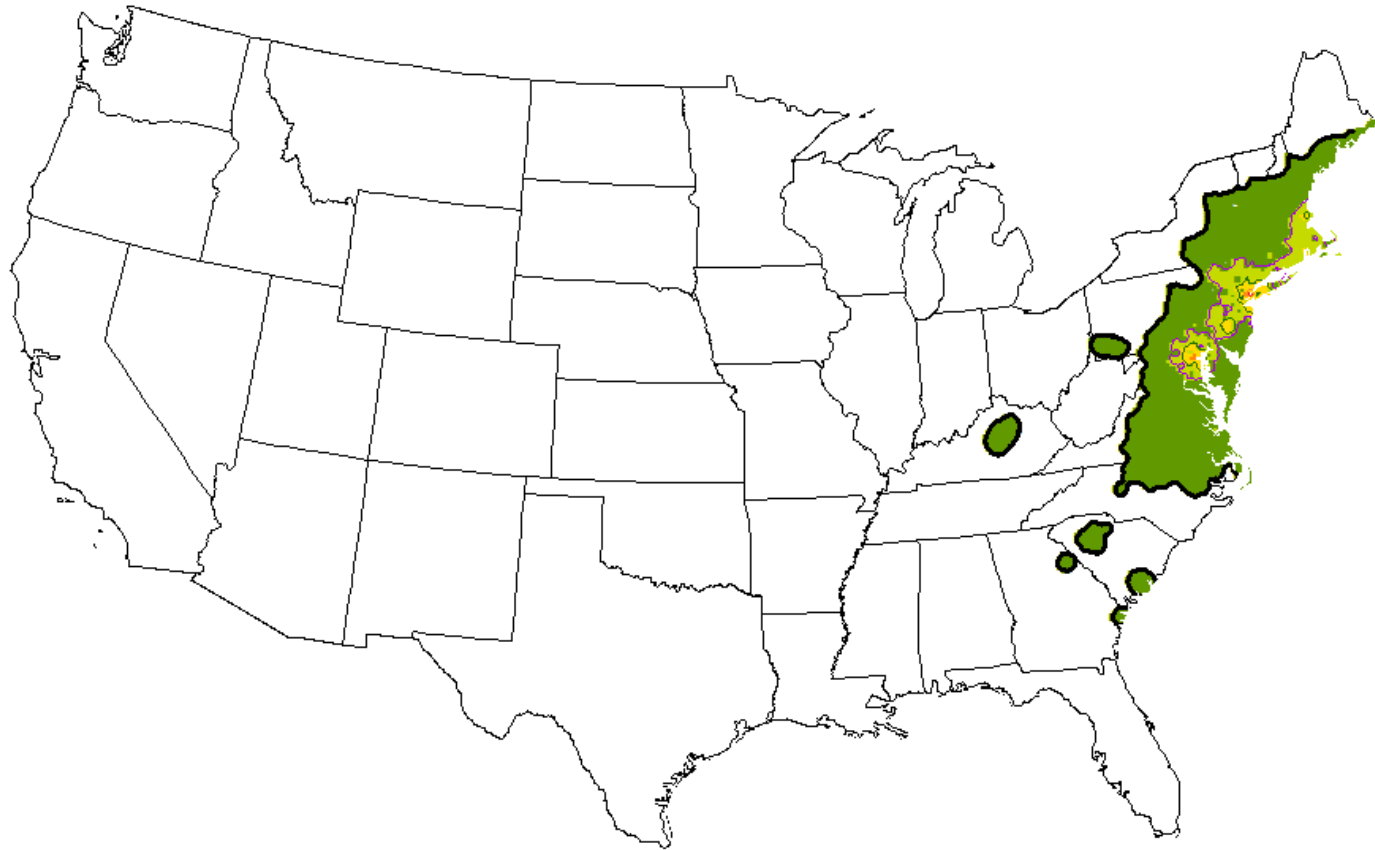
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1790



1790





Questions”