30 years of Change

2020 Census Blocks and Demographics

Jim Castagneri
U.S. Census Bureau
Denver

Why Analyze Census Blocks?

- Census blocks provide the smallest unit of geography for analysis of decennial data.
- Through comparison across decades, block level analysis can identify long-term changes to the population characteristics of a region.
- Visualizations through time reveal intricate patterns of growth and change.

Defining Census Blocks

- Defined once a decade, census blocks cover the entire territory of the United States

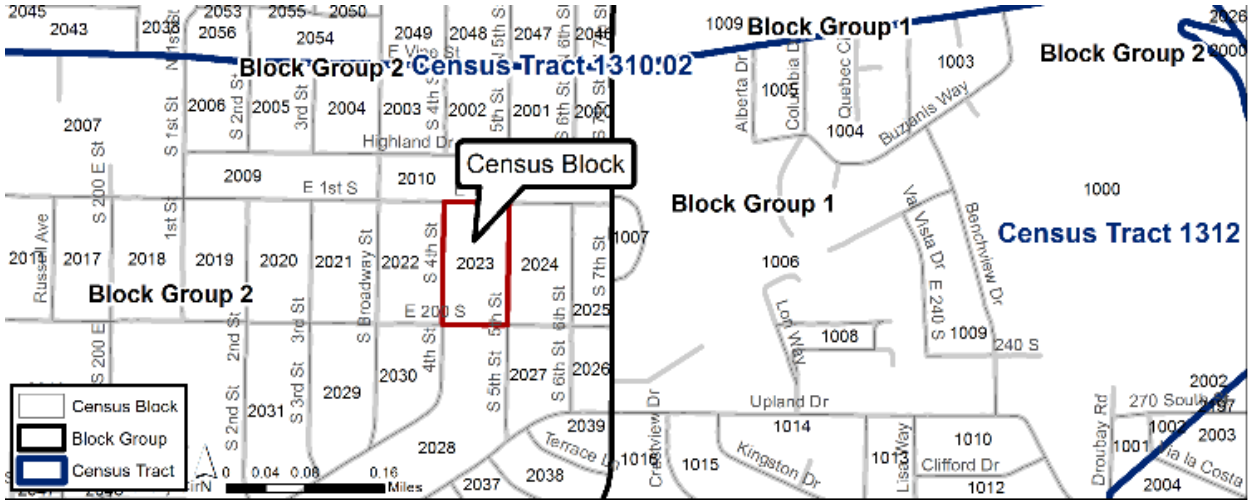
- Census blocks nest within all other tabulated census geographic entities and are the basis for all tabulated data.

- Demographic data are available only from the decennial census 100% data (age, sex, race, Hispanic/Latino origin, relationship to householder, and own/rent house).

Defining Census Blocks

- Census blocks are statistical areas bounded by **visible features**, such as streets, roads, streams, and railroad tracks, and by **nonvisible boundaries**, such as selected property lines and city, township, school district, and county limits.

- Small in area; for example, a City block bounded on all sides by streets. In rural areas, may be hundreds of square miles



Number of Census Blocks by Decade

Geography	1980	1990	2000	2010	2020
CO	38,227	118,289	141,040	201,062	140,345
Mean Area (sq miles)		0.8800	0.7381	0.5177	0.7417
Standard Dev		6.5792	4.8994	3.7738	4.6055
TX	184,315	521,737	675,062	914,231	668,757
Mean Area		0.5153	0.3983	0.2941	0.4020
Standard Dev		5.1898	2.2668	1.7455	2.0610
UNITED STATES	N/A	7,020,924	8,262,363	11,155,486	8,174,955

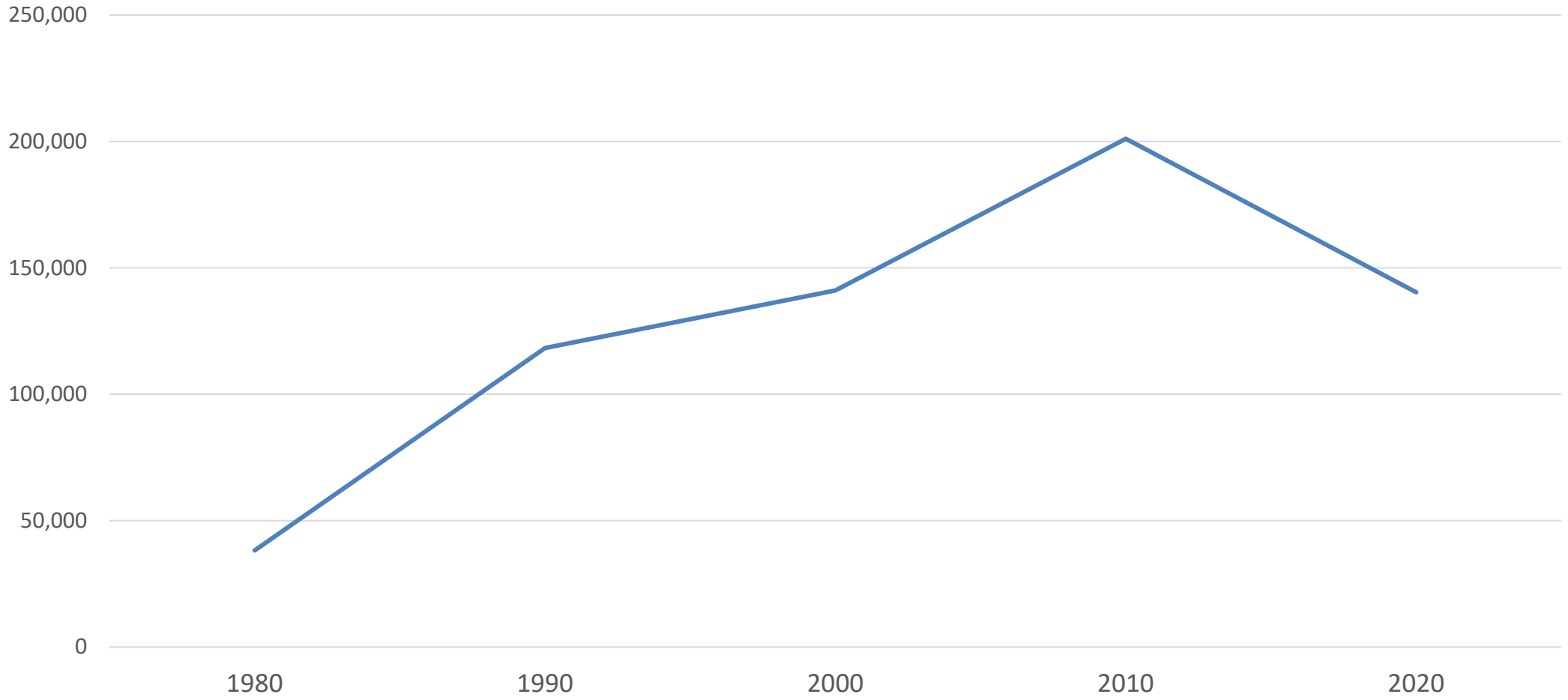
Top Ten Positive Growth States

RANK	2000-2010		2010-2020	
1	Texas	4,293,741	Texas	3,999,944
2	California	3,382,308	Florida	2,736,877
3	Florida	2,818,932	California	2,284,267
4	Georgia	1,501,200	Georgia	1,024,255
5	North Carolina	1,486,170	Washington	980,741
6	Arizona	1,261,385	North Carolina	903,905
7	Virginia	922,509	New York	823,147
8	Washington	830,419	Arizona	759,485
9	Colorado	727,935	Colorado	744,518
10	Nevada	702,294	Virginia	630,369

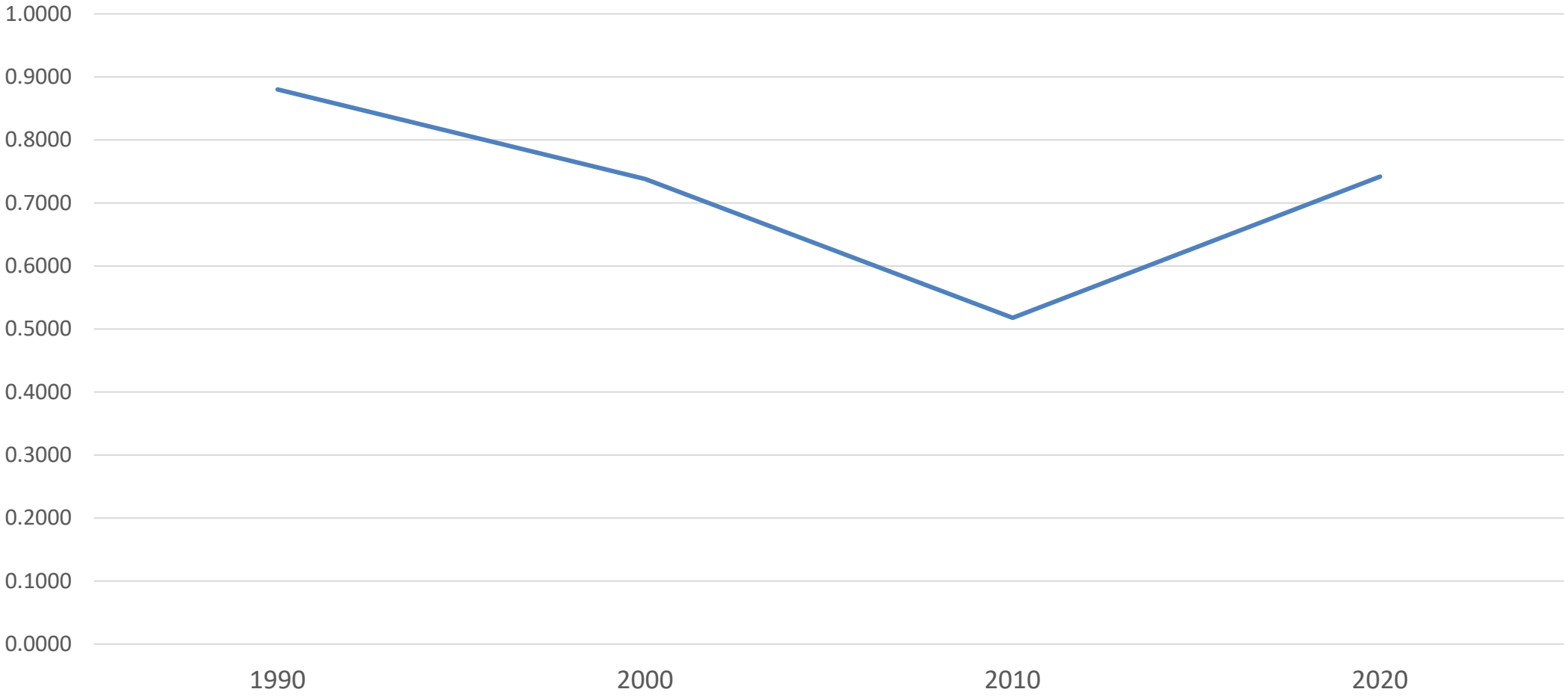
Source: William H. Frey

State of Colorado

Number of Blocks

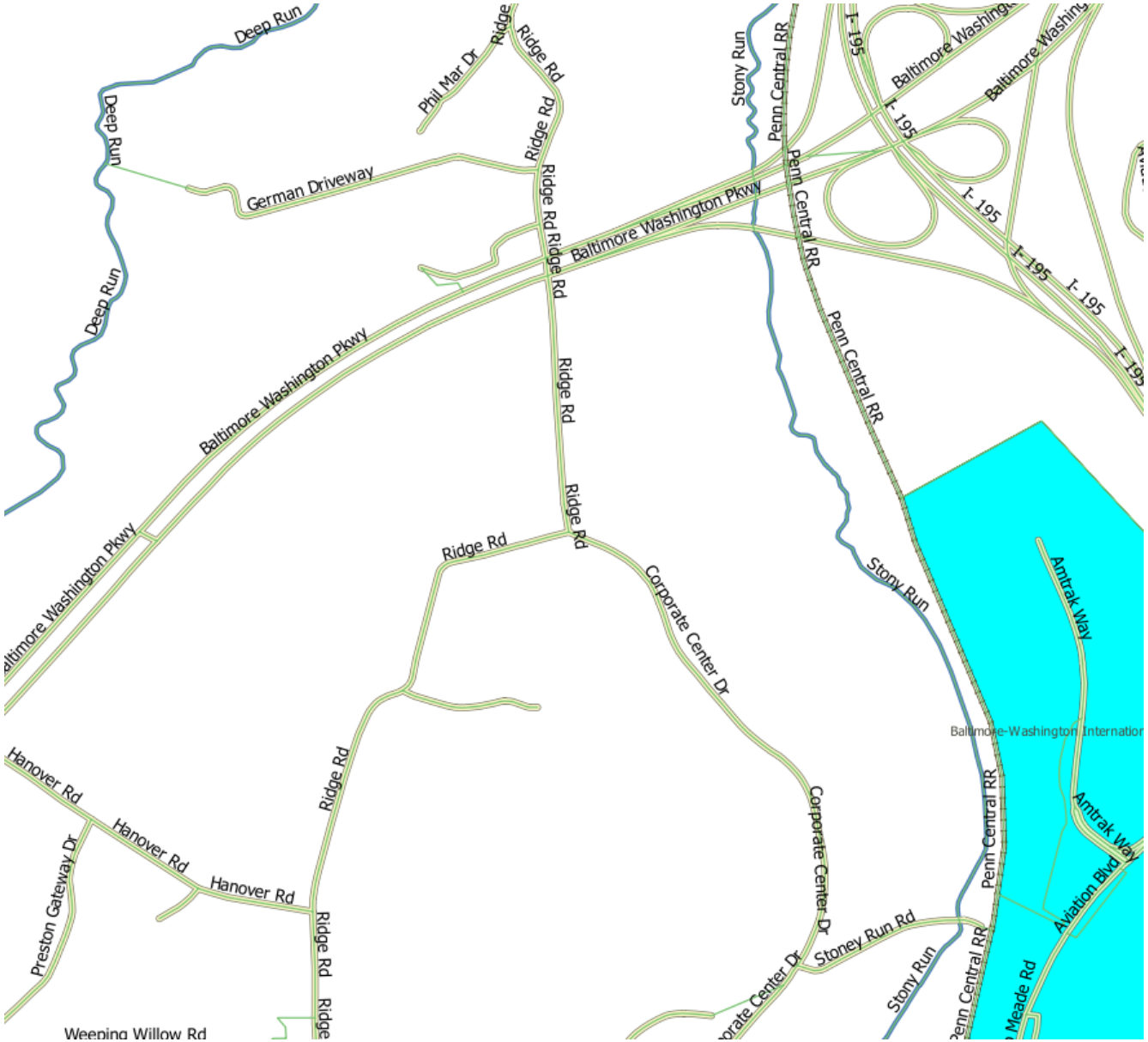


State of Colorado
Mean Block Area



How are Census Blocks Delineated?

- Census Bureau Algorithm Applied Nationally
- Challenge: Visible features and nonvisible boundaries (potential block boundaries) are not evenly distributed nationwide
- Can you create a “one size fits all” algorithm?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Ridge Rd
Ridge Rd
Stony Run
Penn Central RR
I-195
Baltimore Washing
German Driveway
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Baltimore Washington Pkwy
Deep Run
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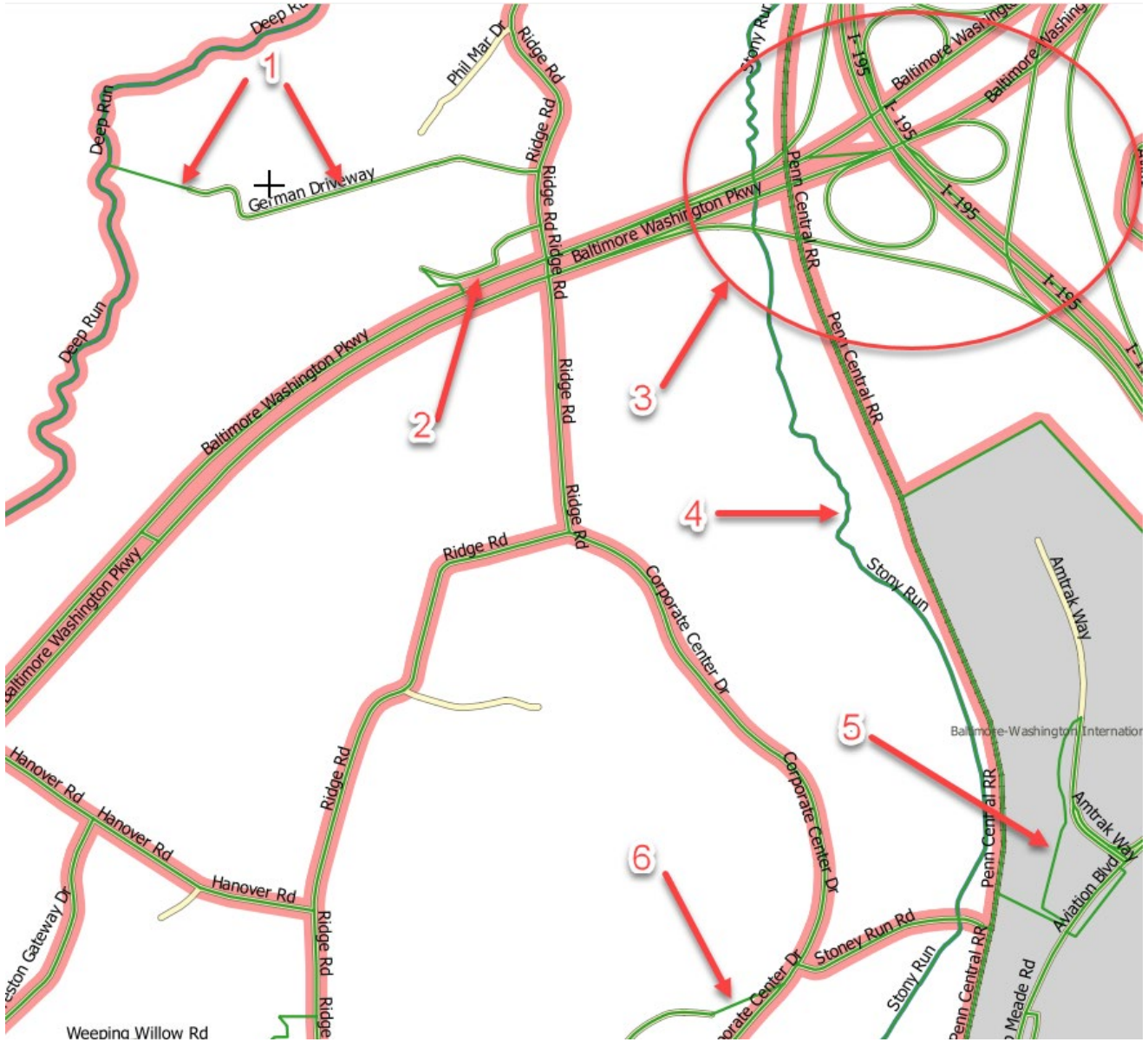
Ridge Rd
Ridge Rd
Corporate Center Dr
Stony Run
Amtrak Way
Hanover Rd
Hanover Rd
Hanover Rd
Ridge Rd
Preston Gateway Dr
Corporate Center Dr
Stoney Run Rd
Penn Central RR
Amtrak Way
Aviation Blvd
Stony Run
Meade Rd
Weeping Willow Rd

How are Census Tabulation Blocks Delineated?

1. Generate the base block layer of physical features (Hydro and Non-Hydro)
   - (Roads (primary, secondary, neighborhood, alleys, service drives, private roads, dirt 4WD vehicular trails, railroads, streams/rivers, canals, power lines, pipelines)
   - Geographic area boundaries (e.g. counties, places, tracts, reservations, voting districts)
   - Includes any edges that form a polygon with other edges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Amtrak Way
Aviation Blvd
Stoney Run Rd
Hanover Rd
Meade Rd
Weeping Willow Rd

How are Census Tabulation Blocks Delineated?

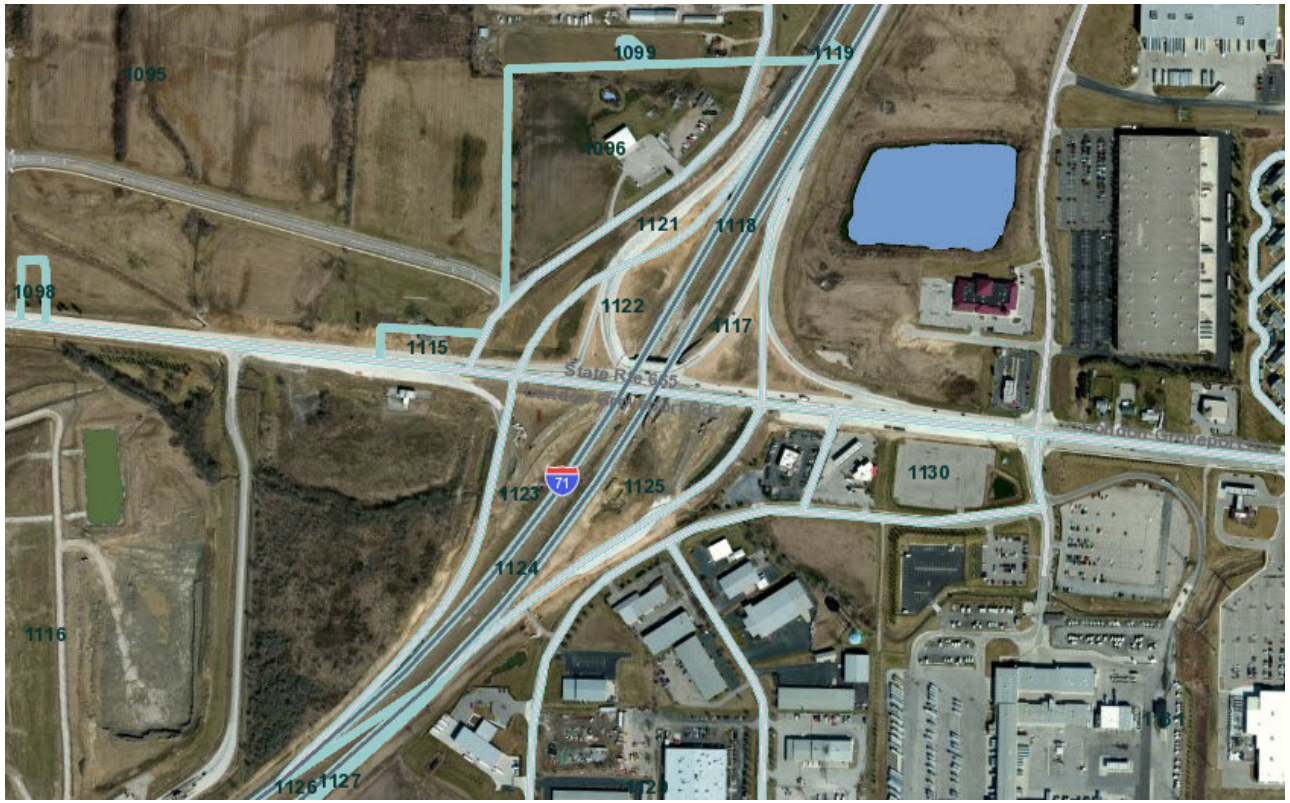
2. Assign priority values to each edge
   - Priority values assigned to each edge, 0-99
   - The higher the priority value, the less likely it is to be merged across
3. Conduct merges based on priority values
   - Type of feature (MAF/TIGER Feature Class Code or MTFCC)
   - If feature is named
   - Size of the preliminary block
   - Number of addresses in the preliminary block

2020 Census Block Algorithm at Work

2010 Blocks created by roads in cemeteries

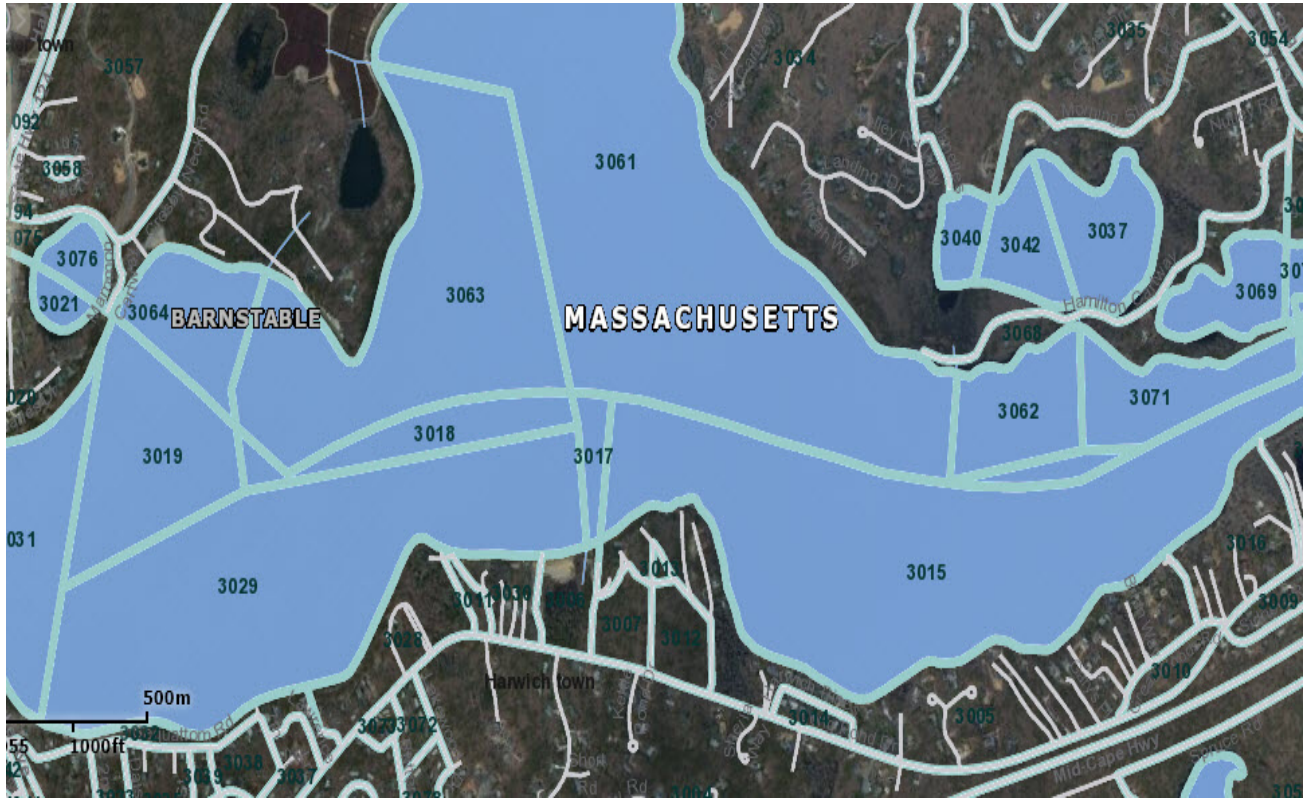
2020 Census Block Algorithm at Work

Highway ramps and intersections (S1630)



2020 Census Block Algorithm at Work

Excessive blocks within water areas



Block data as the marker of Change

- The following maps depict changes in the distribution of minority populations in Texas and Colorado.
- Census blocks from the 1990, 2000, and 2010 Census were imported into ArcMap and joined with the block level population data.
- Analysis and mapping of the 2020 block level demographic data will be conducted after the release of the PL 94-171 data in September of this year.

30 Years of Change
Texas Gulf Coast

The comparison does **not** include unreleased 2020 block level demographic data

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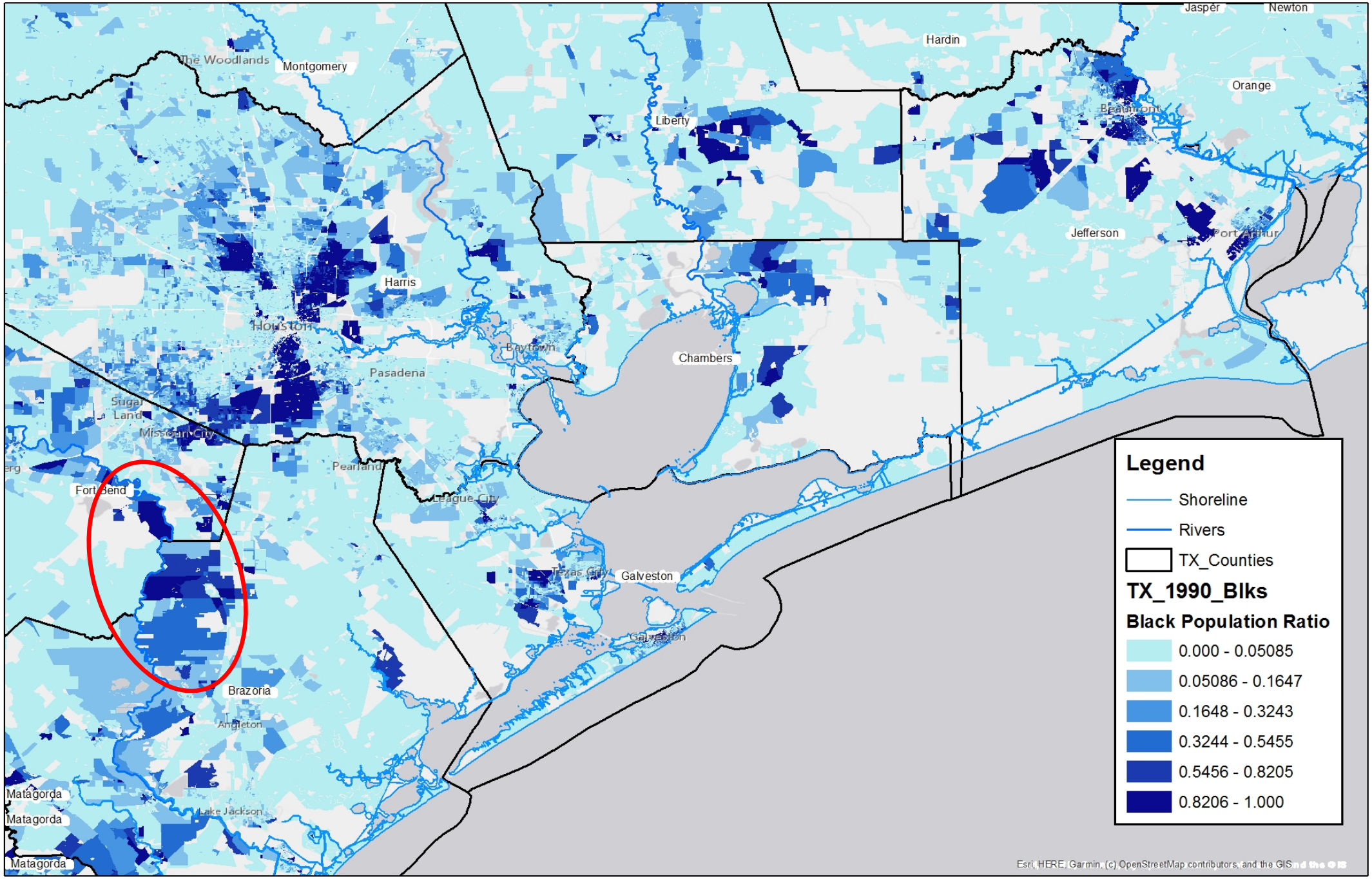
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TX_1990_Blks
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0.05086 - 0.1647
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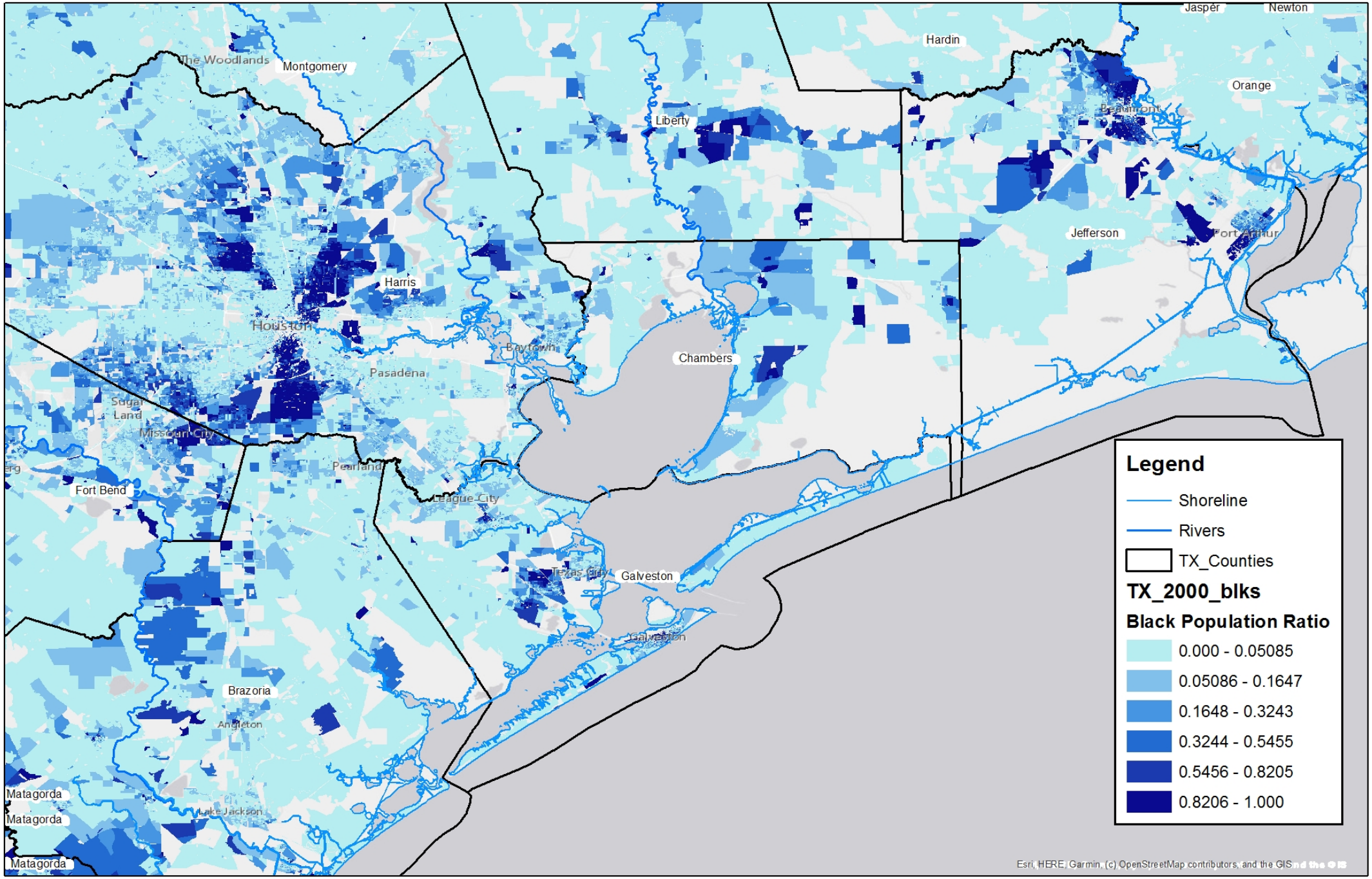
Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS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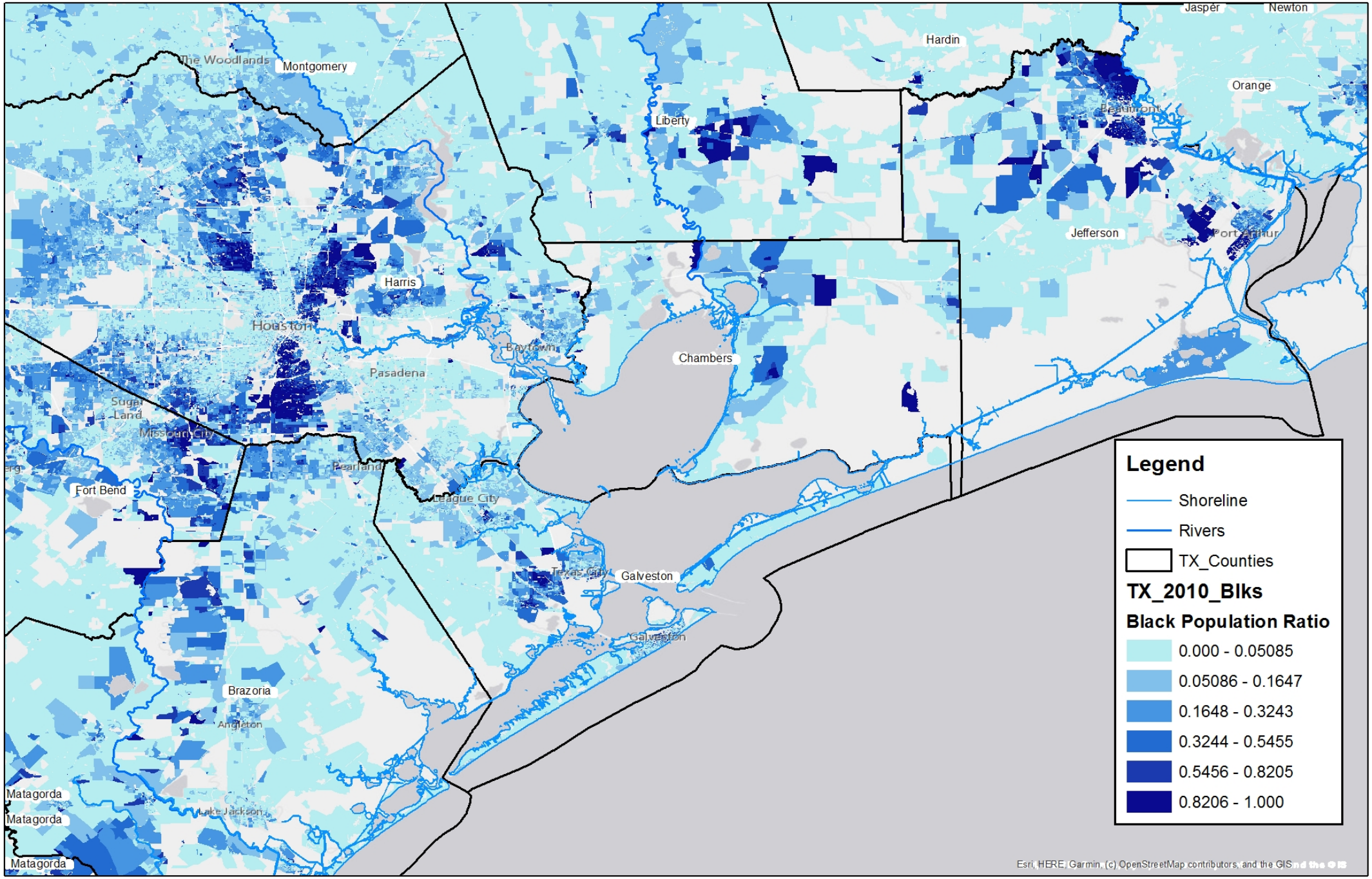
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30 Years of Change
Denver Metro Area

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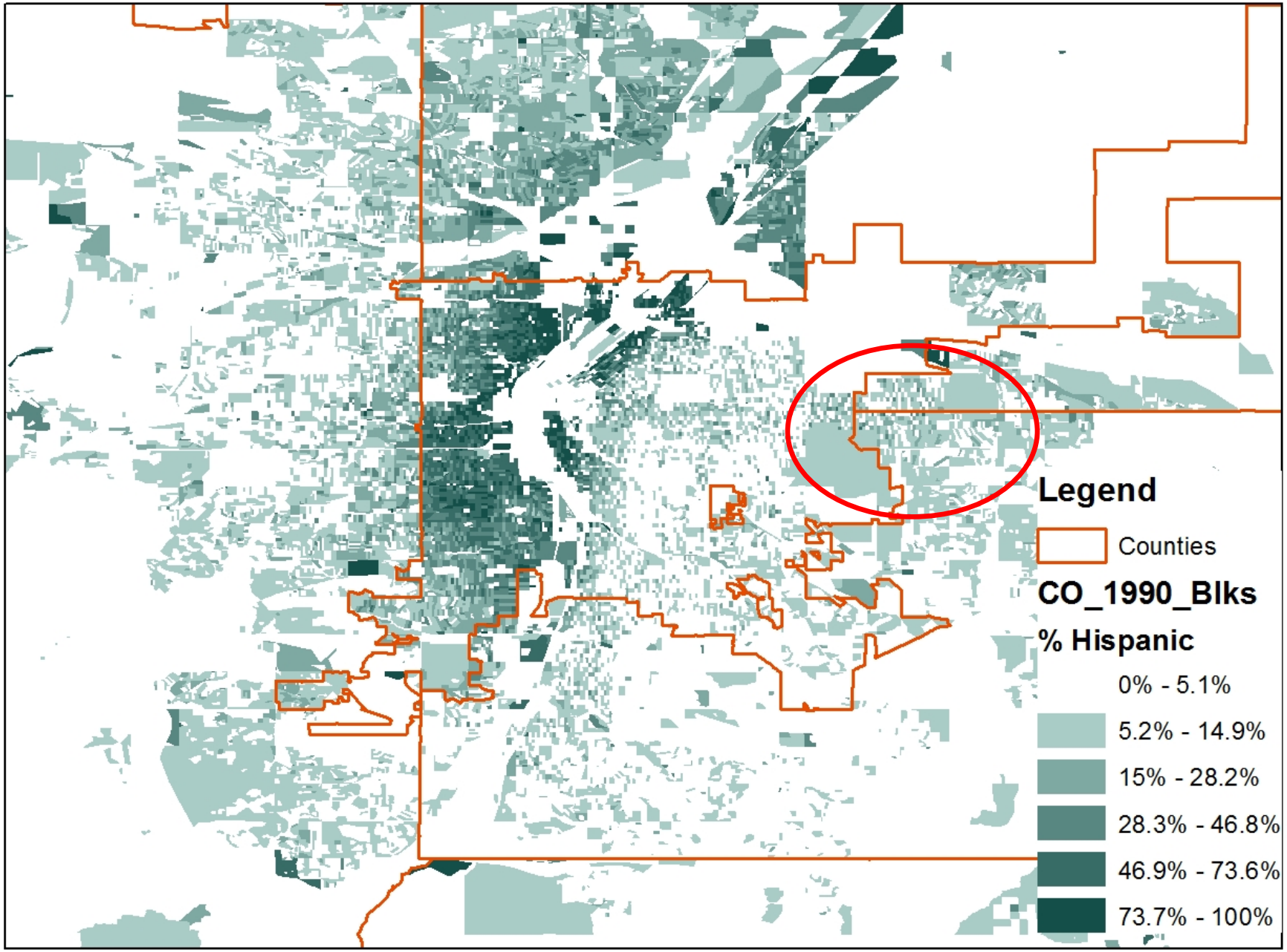
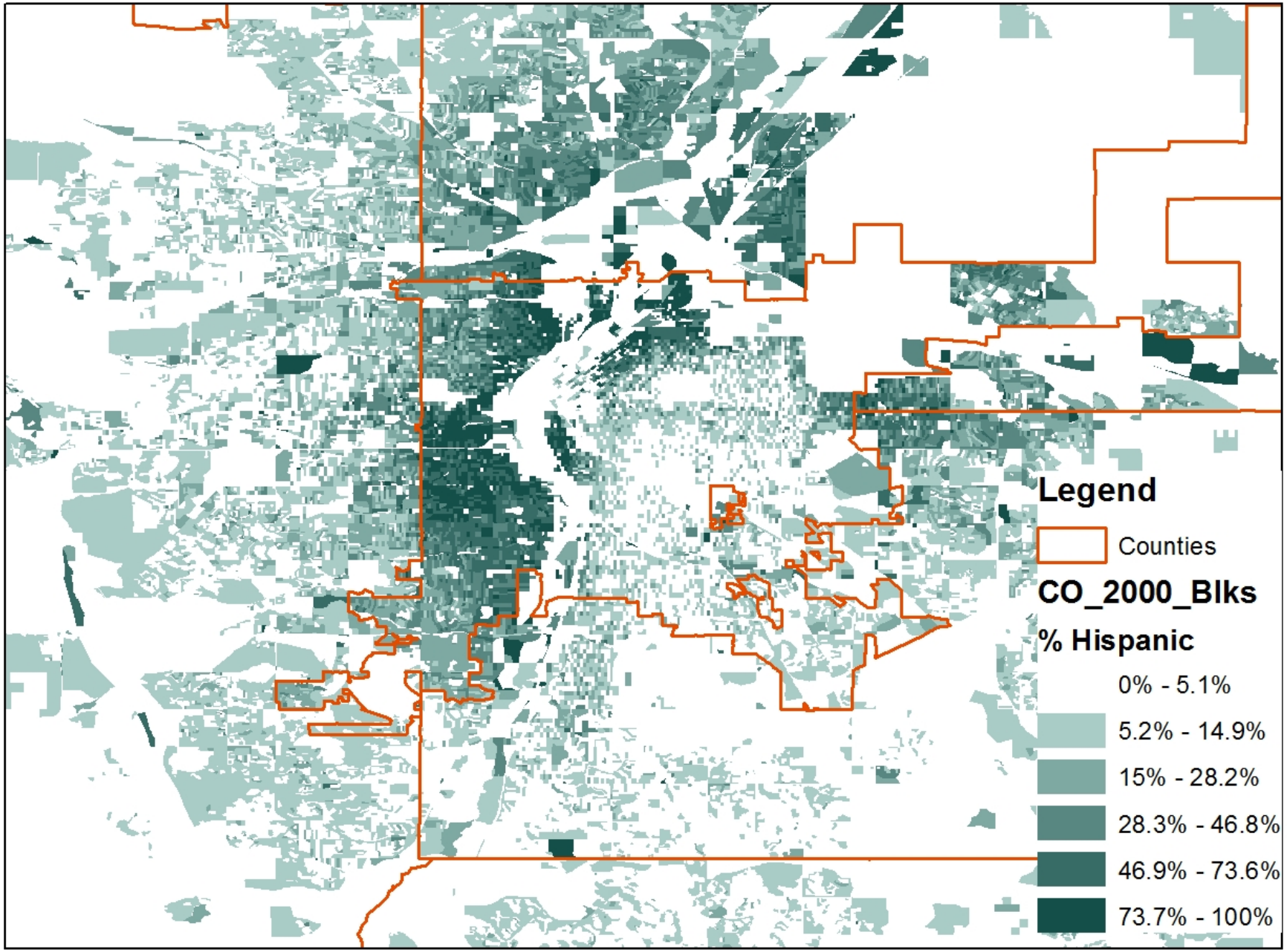


United States Census Bureau



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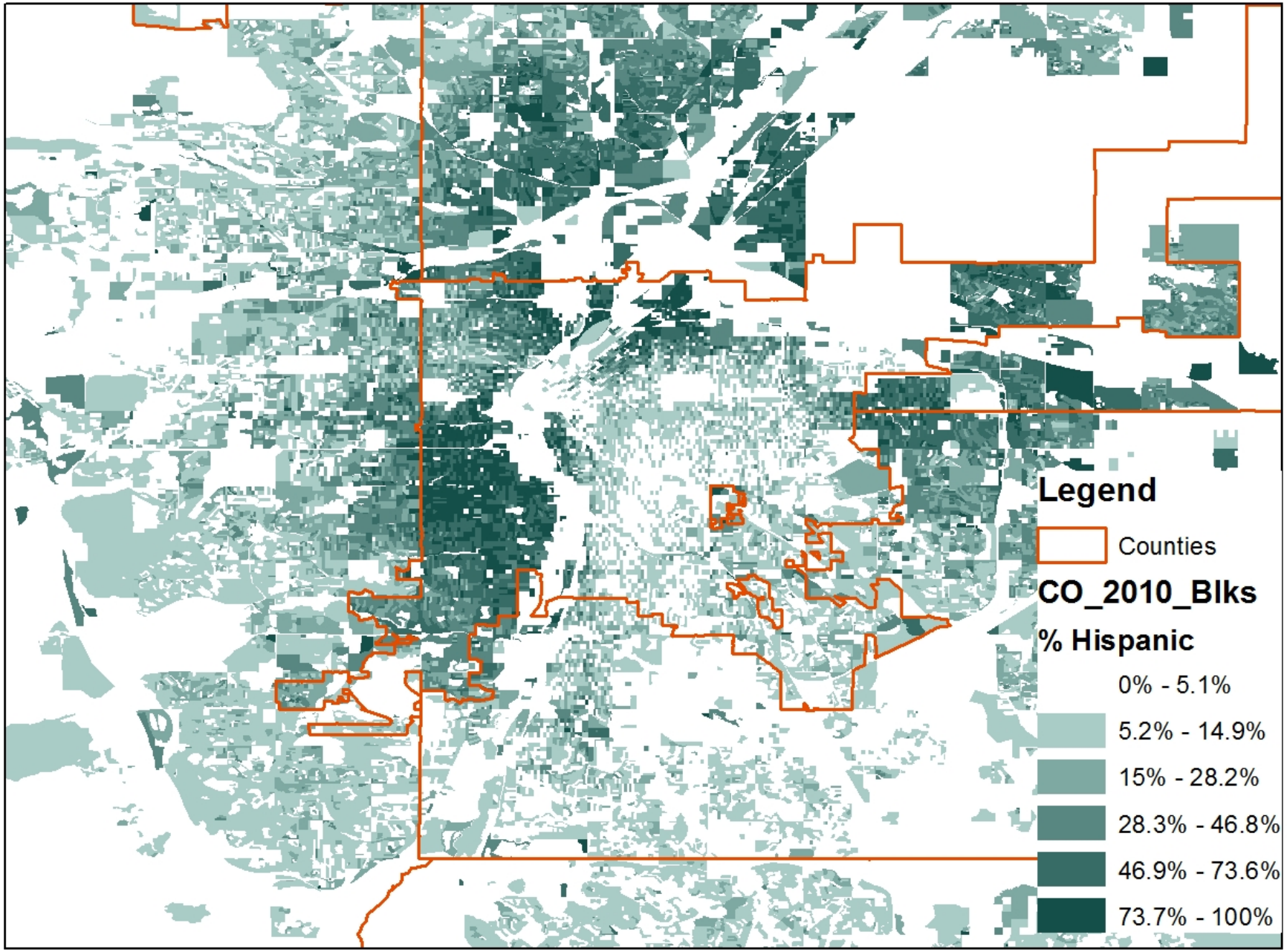

United States Census Bureau

30 Years of Change
San Antonio

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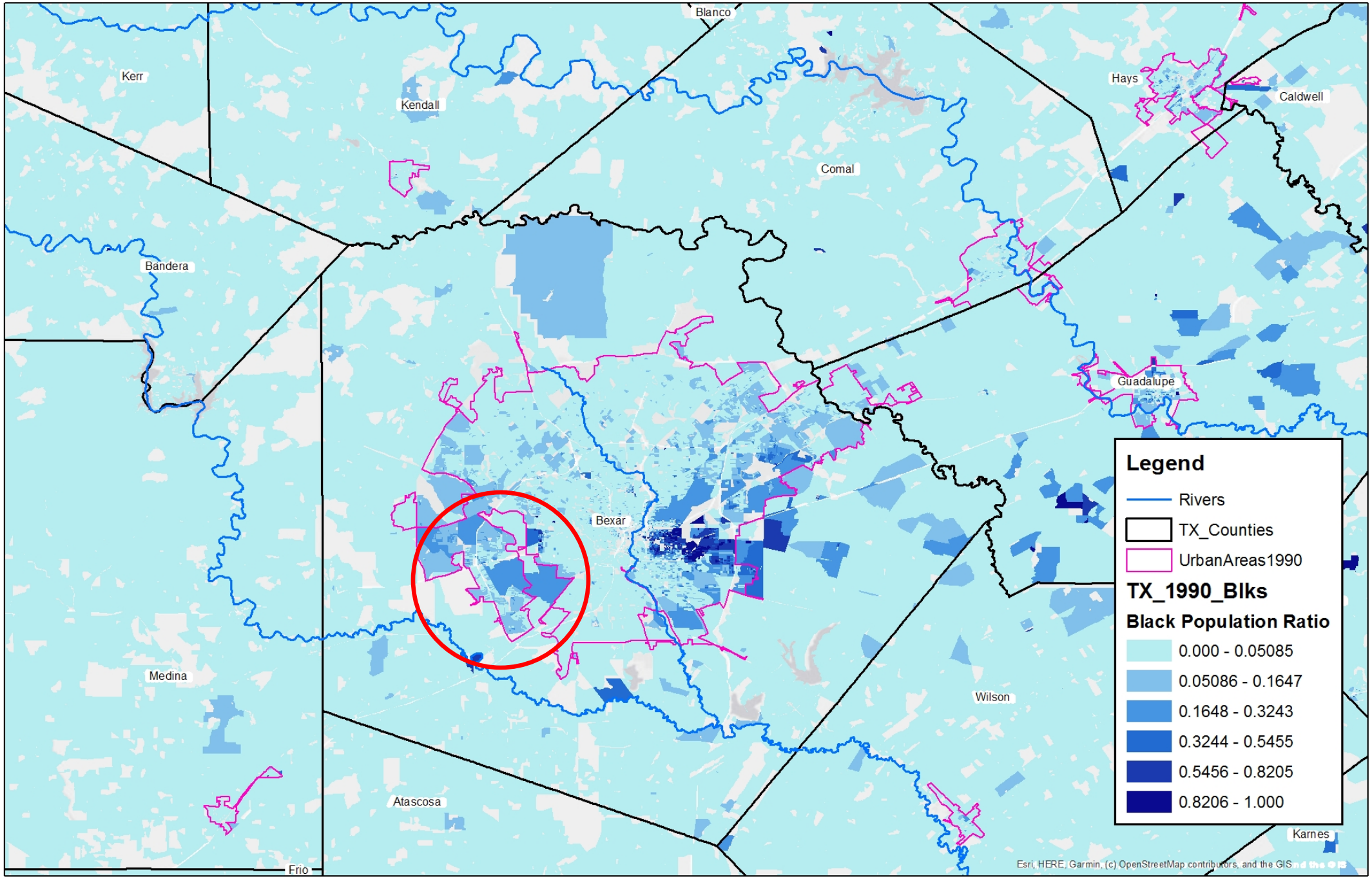
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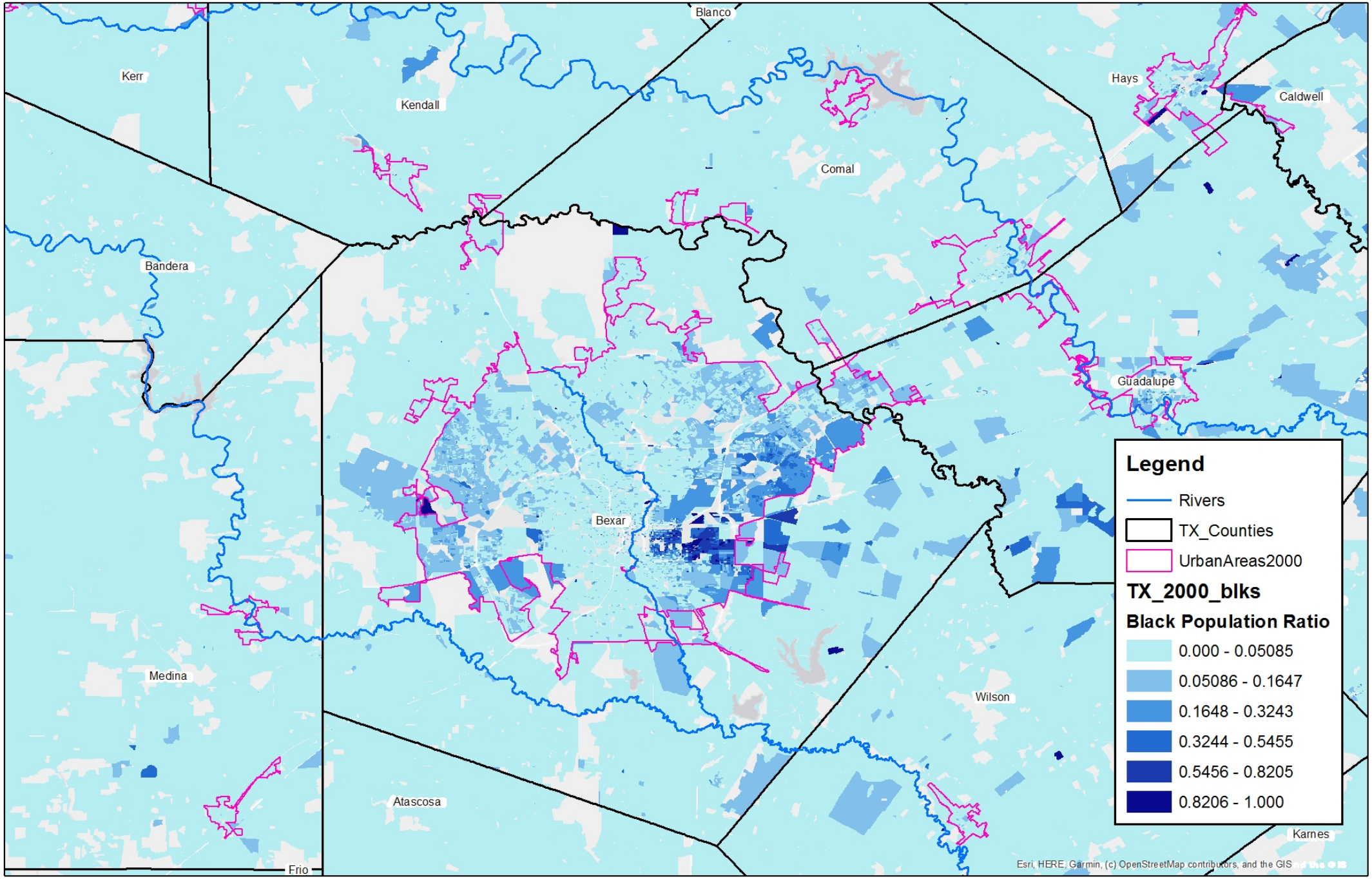
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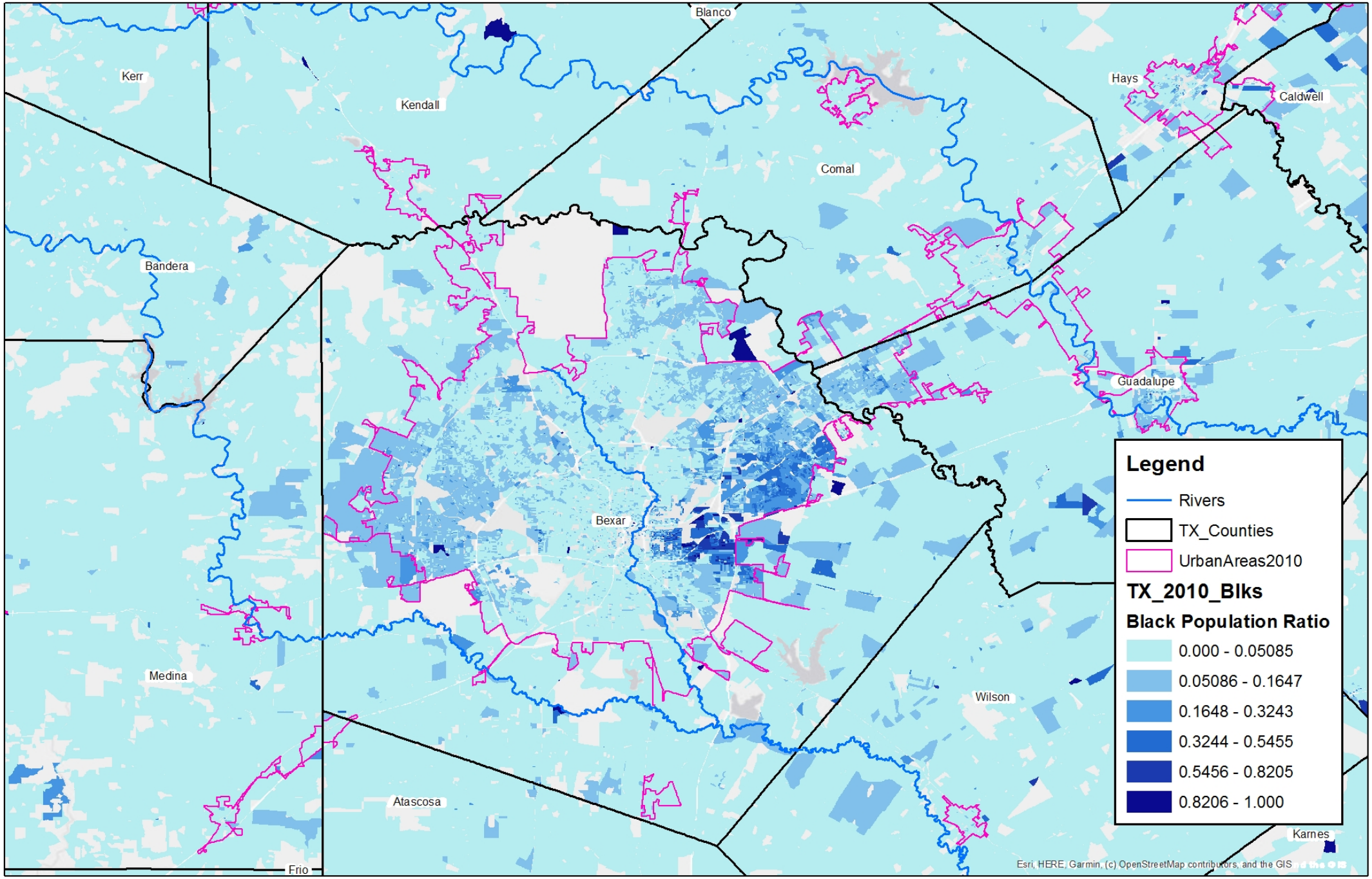
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Next steps:

- Incorporate 2020 demographics when released
- Investigate additional metro areas for growth and change
- Report back in 2022?

Thank You!

James.d.Castagneri@Census.gov