

# Remapping the American Community Survey

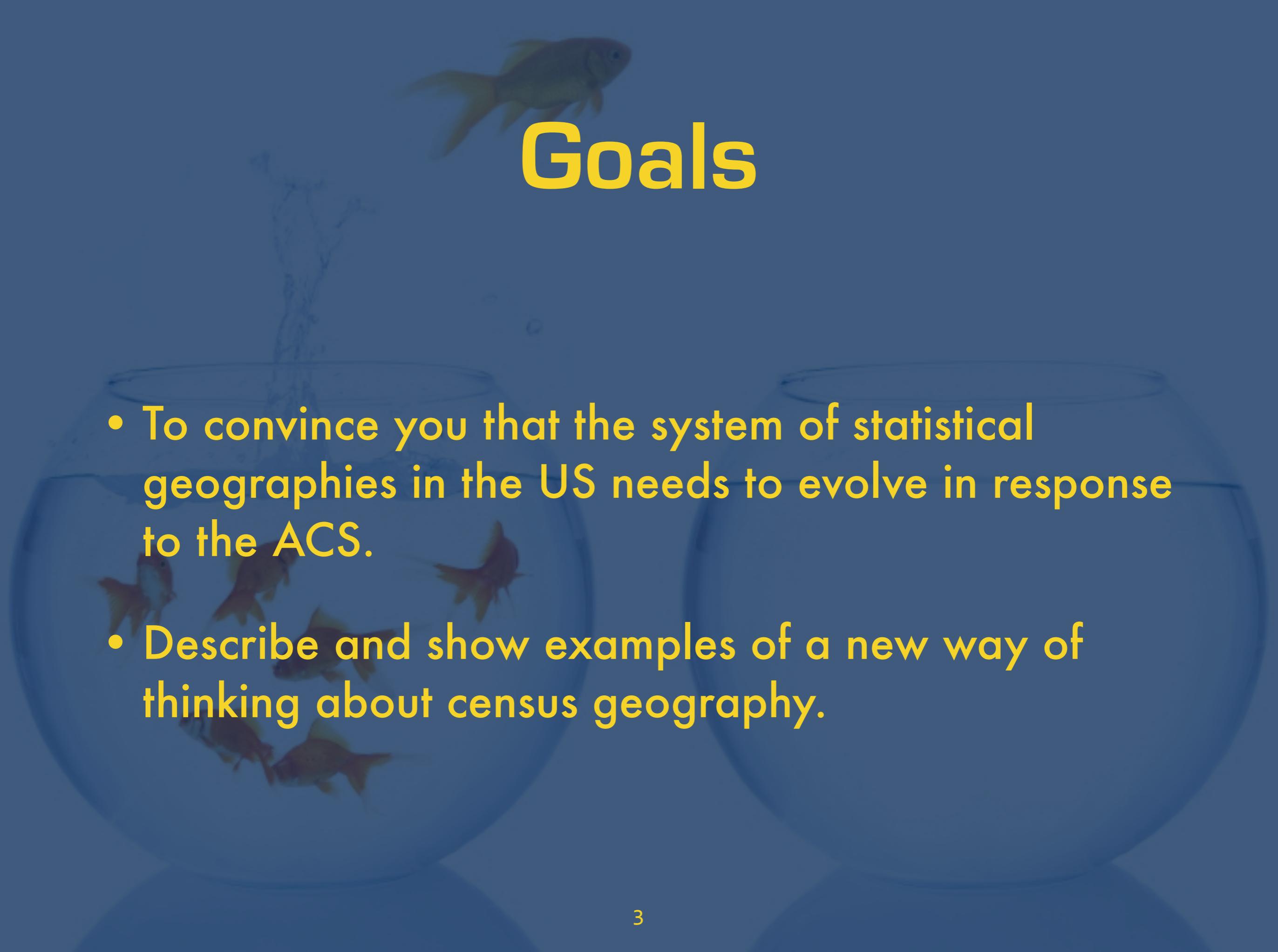
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# American Community Survey

- The American Community Survey (ACS) is the primary national source for demographic and economic data about neighborhoods.
- The ACS produces over 1000 tables for 74,000+ tracts and 200,000+ block groups each year.
- Used to allocate \$450-\$500 Billion in federal spending.



# Goals

- To convince you that the system of statistical geographies in the US needs to evolve in response to the ACS.
- Describe and show examples of a new way of thinking about census geography.

# ACS Estimates of African-American Median Household Income in Denver, Colorado

Census Tract	Estimate
Census Tract 41.01	\$28,864
Census Tract 41.02	\$21,021
Census Tract 41.03	\$43,021
Census Tract 41.04	\$36,092
Census Tract 41.06	\$60,592

# ACS Estimates of African-American Median Household Income in Denver, Colorado

Census Tract	Estimate	Margin of Error
Census Tract 41.01	\$28,864	\$8,650
Census Tract 41.02	\$21,021	\$4,458
Census Tract 41.03	\$43,021	\$14,612
Census Tract 41.04	\$36,092	\$3,685
Census Tract 41.06	\$60,592	\$68,846

# Los Angeles Tracts: Number of Children Below Poverty Line

CENSUS TRACT	KIDS ≤ 5 IN POVERTY	MARGIN OF ERROR
Census Tract 2048.10, Los Angeles County, California	92	142.2
Census Tract 2060.10, Los Angeles County, California	99	115.0
Census Tract 2122.03, Los Angeles County, California	61	174.1
Census Tract 1913.01, Los Angeles County, California	25	170.1
Census Tract 1098, Los Angeles County, California	55	141.3
Census Tract 1204, Los Angeles County, California	95	151.3
Census Tract 1976, Los Angeles County, California	12	165.6
Census Tract 1349.03, Los Angeles County, California	35	172.9
Census Tract 2060.32, Los Angeles County, California	291	162.9
Census Tract 2124.20, Los Angeles County, California	133	125.8
Census Tract 1233.01, Los Angeles County, California	87	146.6
Census Tract 1414, Los Angeles County, California	100	169.5

# Continuous Data Collection

- Every month of every year the Census Bureau contacts about 300,000 households
- Approximately 2/3 response rate
- Benefits
  - permanent staff
  - more frequent data dissemination
  - etc...

# Big Places – Big Benefits

- Enough ACS data is collected for large cities and counties to get good annual estimates (city totals)
- The once-a-decade model collected more than enough (too much?) raw data to make reasonable estimates for large places
- The ACS maximizes its raw data: large places get annual estimates and small ones get data pooled over 5 years

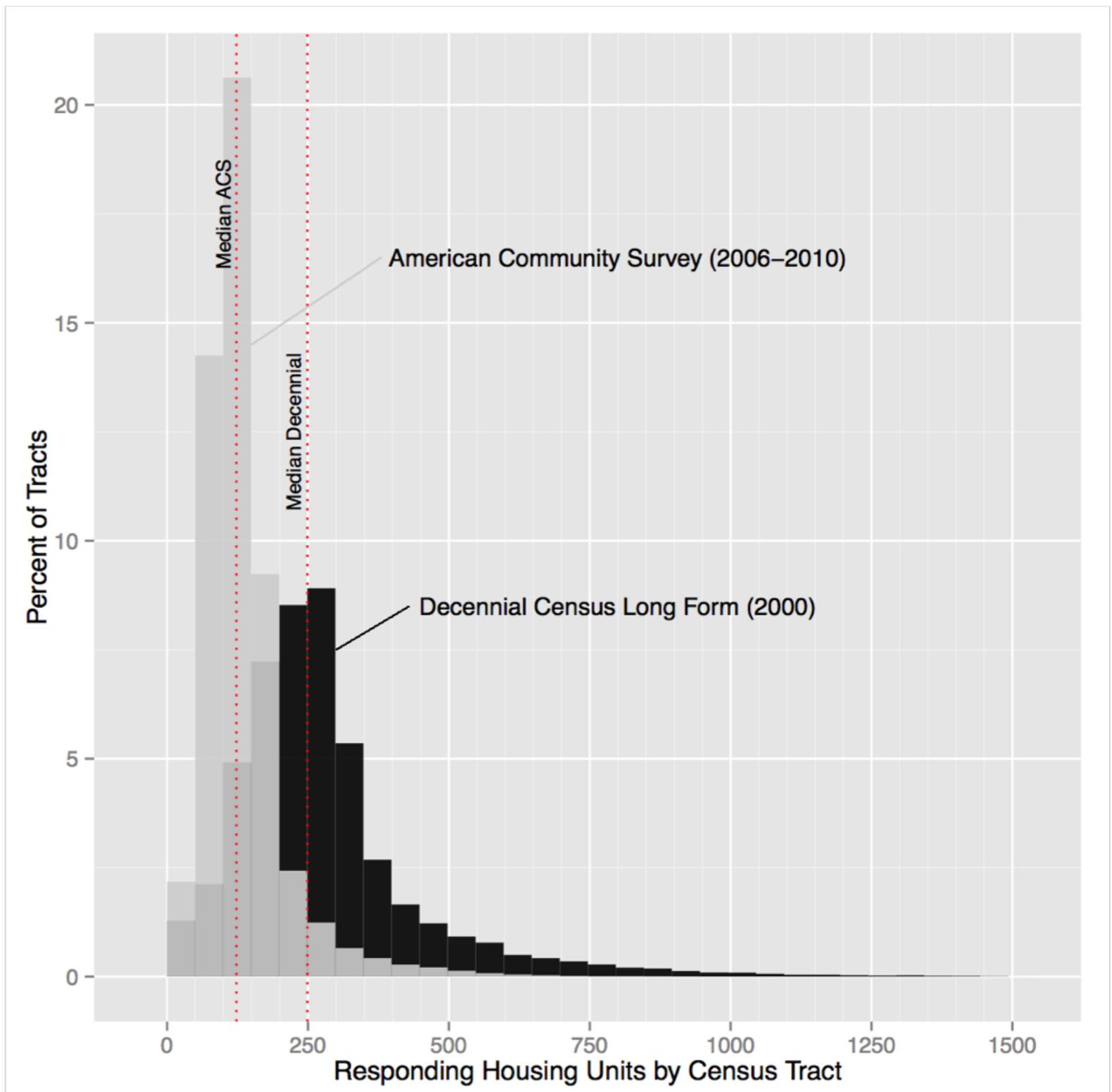
# ACS Period Estimates

Geographic Areas	1-year estimates areas w/ 65,000 +		3-year estimates areas w/ 20,000 +		5-year estimates
	count	percent	count	percent	count
County	825	26%	1,909	59%	3,221
Census Tract	0	0%	0	0%	74,001
Block Group	0	0%	0	0%	220,333
Place	568	2%	2,157	7%	29,509
MSA/M-MSA	530	55%	934	98%	955

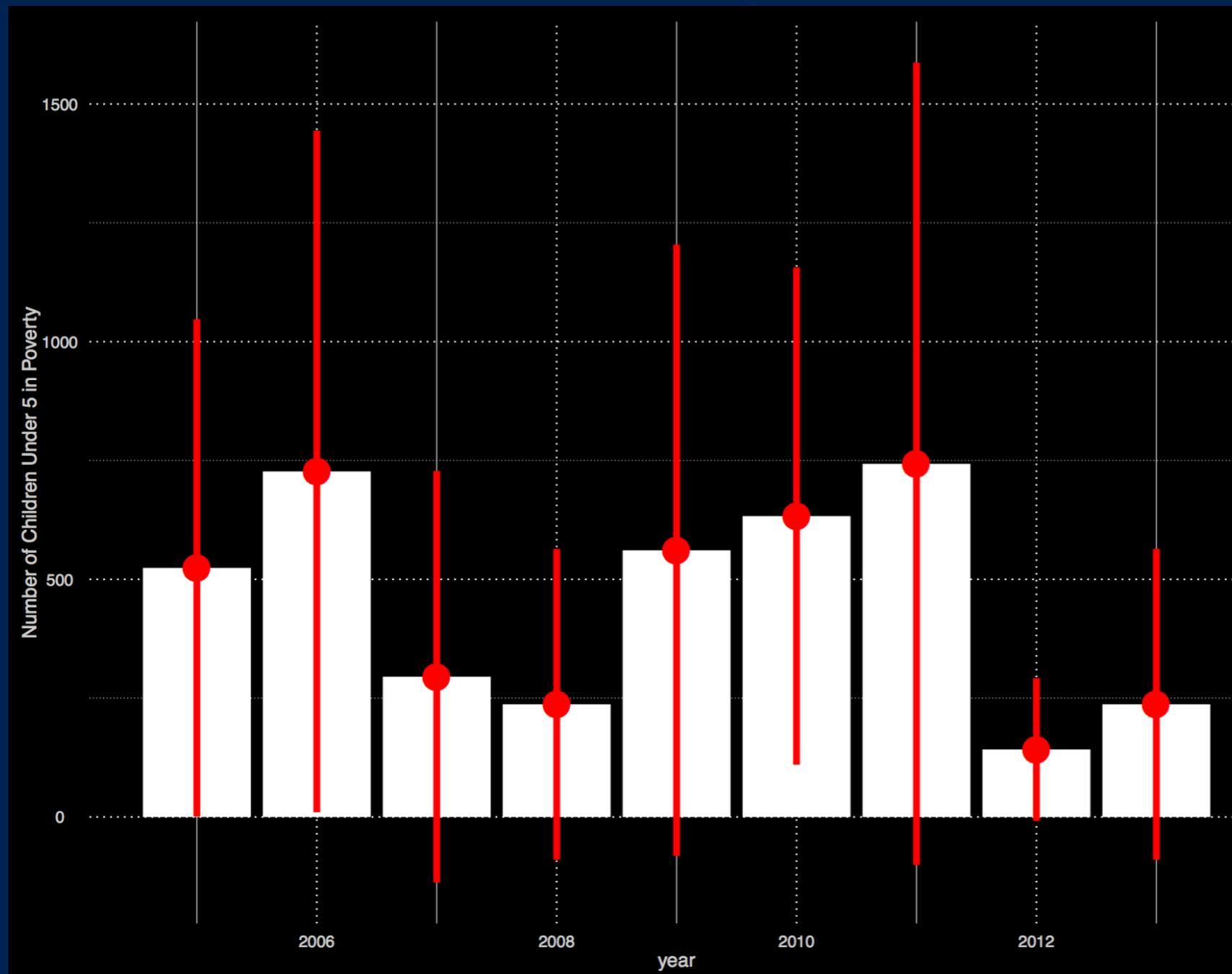
# Census Tract Response Levels

Median responses  
per tract

- 2000 long form: 249
- ACS 2006-2010: 123

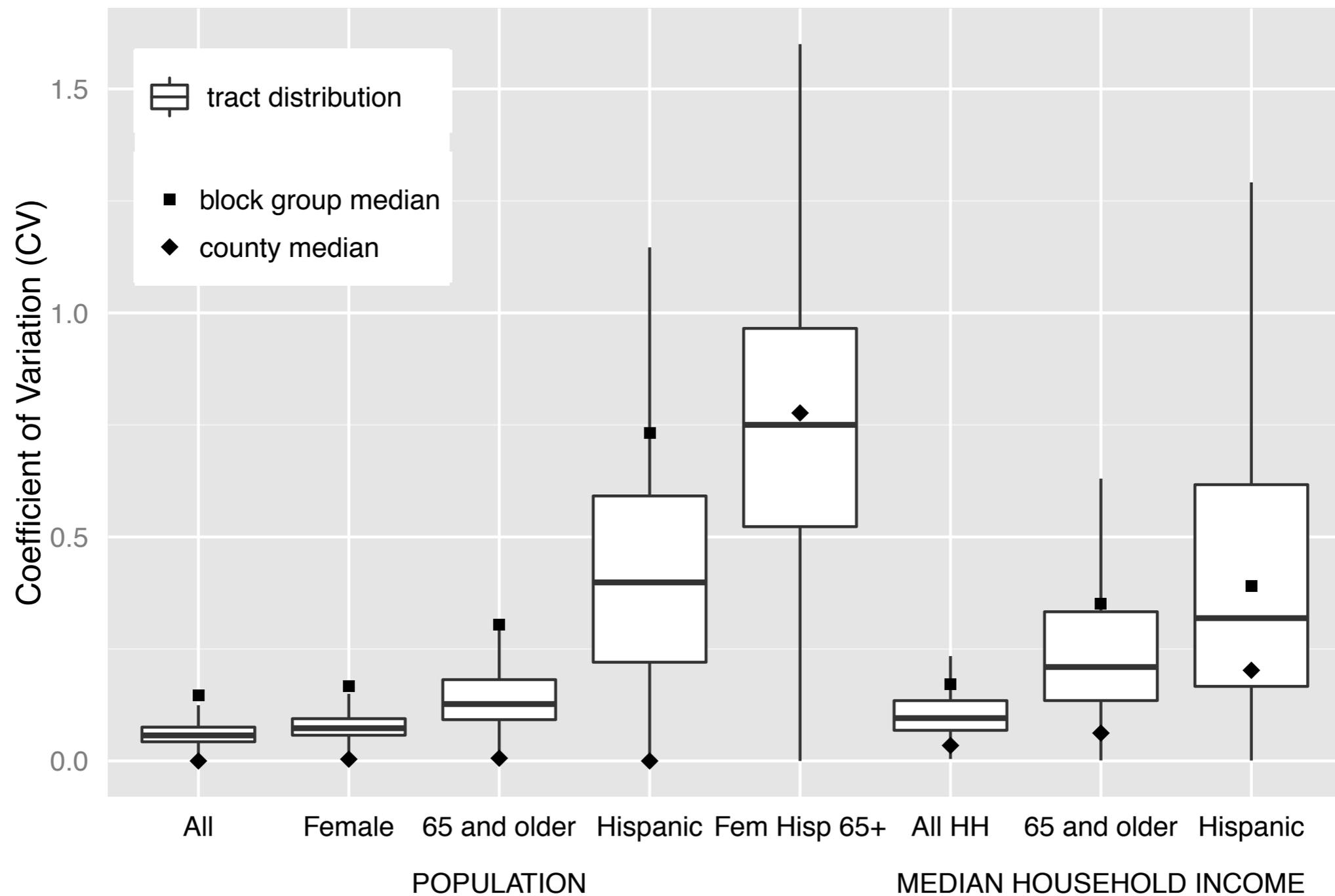


# Temporal Dynamics



Has the number of poor kids in Boulder, CO changed?

# Attribute Detail Matters



PRESS RELEASE | November 18, 2013, 2:05 p.m. ET

# Broadway Federal Bank Receives Bank Enterprise Award from U.S. Treasury's CDFI Fund

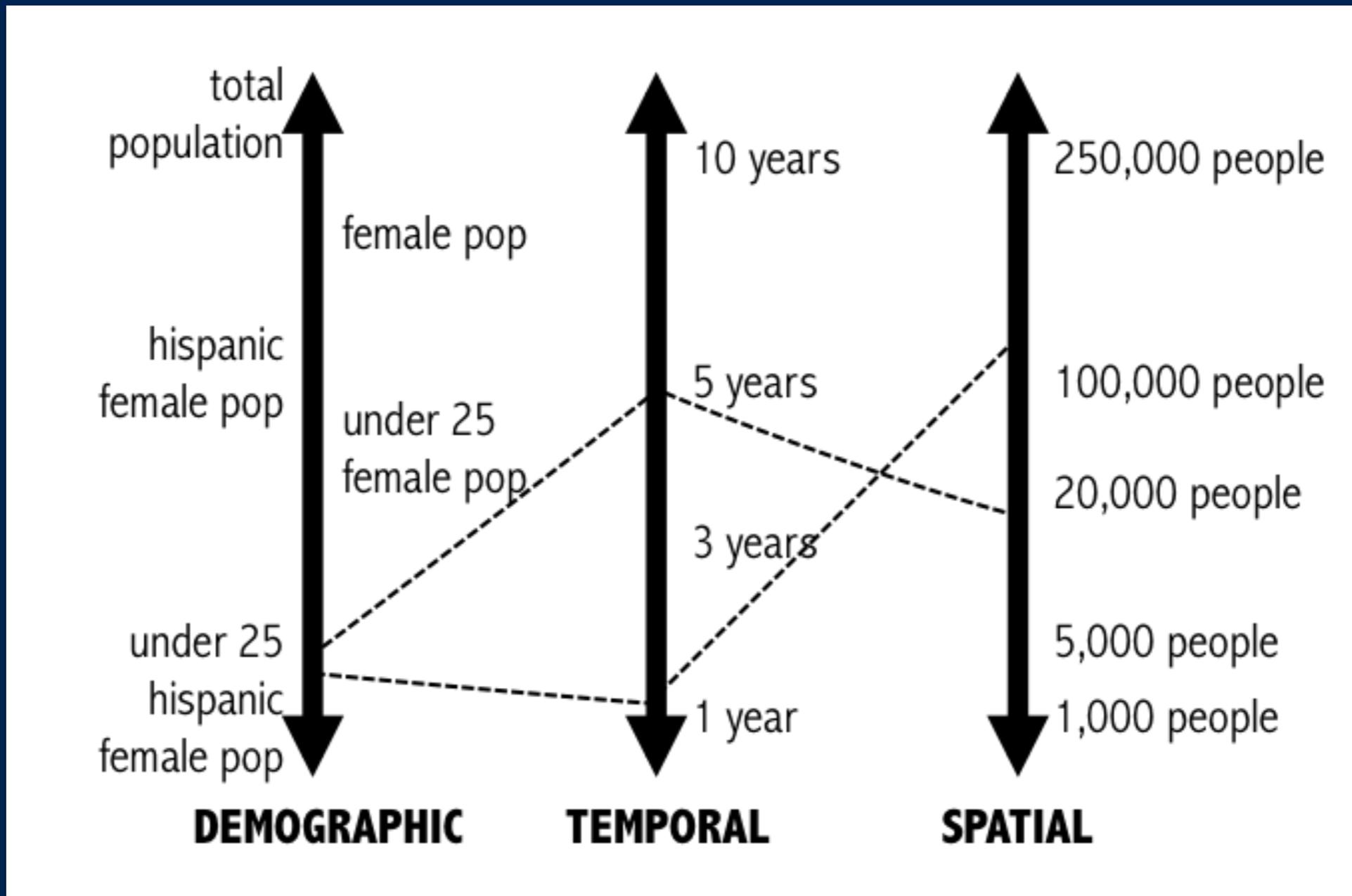
LOS ANGELES--(BUSINESS WIRE)--November 18, 2013--

Broadway Financial Corporation (the "Company") (NASDAQ Capital Market: BYFC), announced that on Friday, November 15(th) , its wholly-owned subsidiary, Broadway Federal Bank, f.s.b. (the "Bank"), received a Bank Enterprise Award ("BEA") of \$199,951 as part of the fiscal year 2013 BEA Program offered by the U.S. Department of the Treasury's Community Development Financial Institutions Fund ("CDFI Fund").

The Bank was one of 85 recipients under the fiscal year 2013 BEA Program, which awarded a total of approximately \$17 million to support the selected depository institutions in their efforts to expand financial support for low-income communities by encouraging community and economic development across the country. Recipients of the awards are required to invest their awards in eligible activities, such as affordable housing projects, small business loans and commercial real estate projects, in distressed communities. The activities that qualify a potential recipient for an award under the BEA Program occur in census tracts where at least 30 percent of the population lives at or below the national poverty level and where the unemployment rate is 1.5 times above the national average. Awards granted were selected after a comprehensive review of 98 applications received by the CDFI Fund from depository institutions across the nation, which represented an increase of 38 percent over the number of applicants over the prior year and the largest number of applicants since fiscal year 2002.

**Tract level poverty estimates 2011 ACS:  
MOE is  $\geq 50\%$  of the estimate in 35,737 tracts  
(approx. 50% of all tracts in the US)**

# Dimensions of Data Aggregation



# Aggregating Data to Reduce Uncertainty

- Temporal aggregation
  - current Census Bureau approach
  - not too many options
- Attribute aggregation
  - easy for users to implement
  - detailed demographic subsets are often needed
- Spatial aggregation
  - not immediately clear how to do it

# Fixing the ACS

- For many policy relevant variables the ACS margins of error are too high
- Our surveys indicate that people often ignore the margin of error in making planning decisions
- We need a way to improve the usability of the data (i.e. reduce the margins of error)
- We think there is a geographic fix...

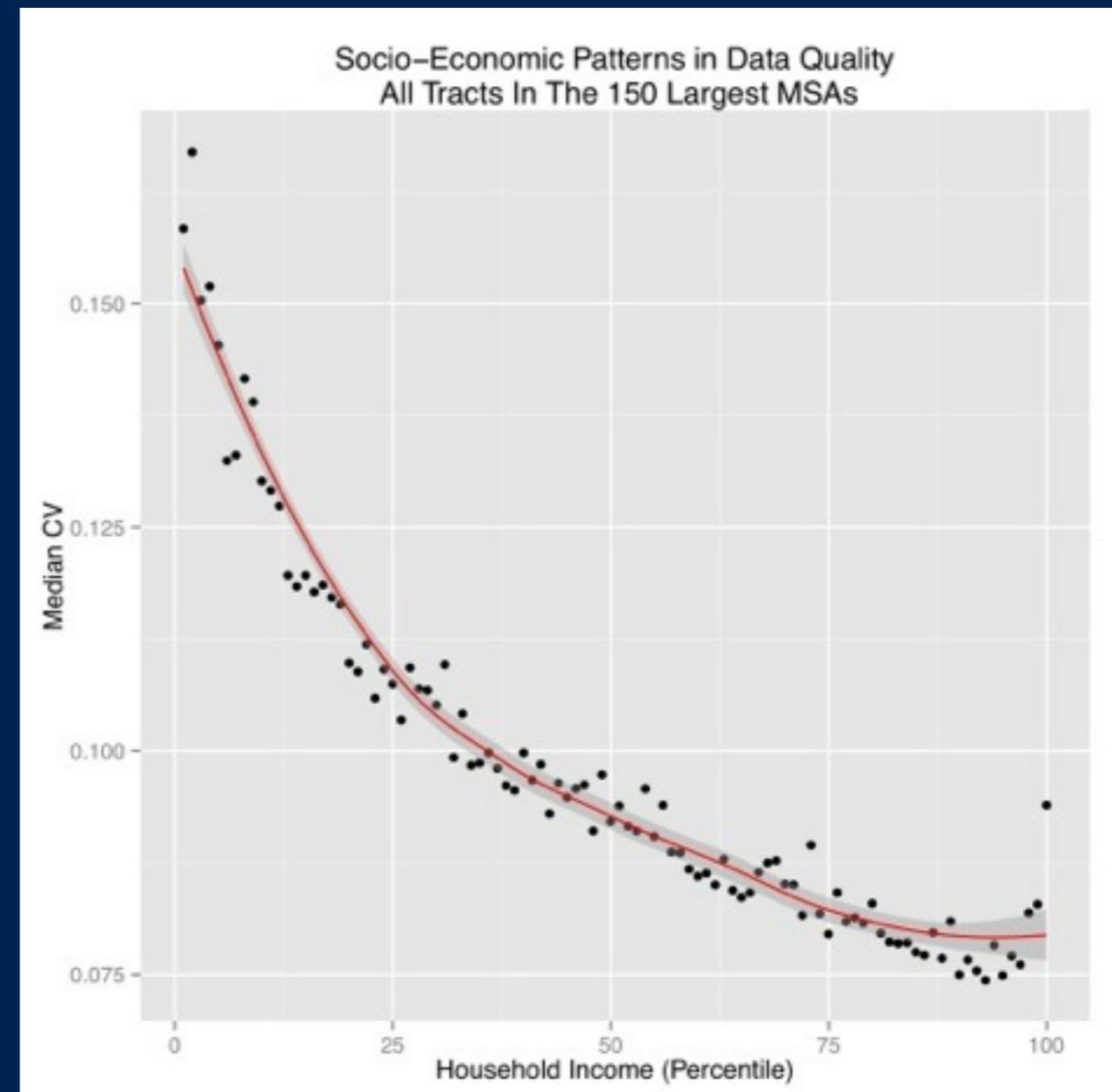
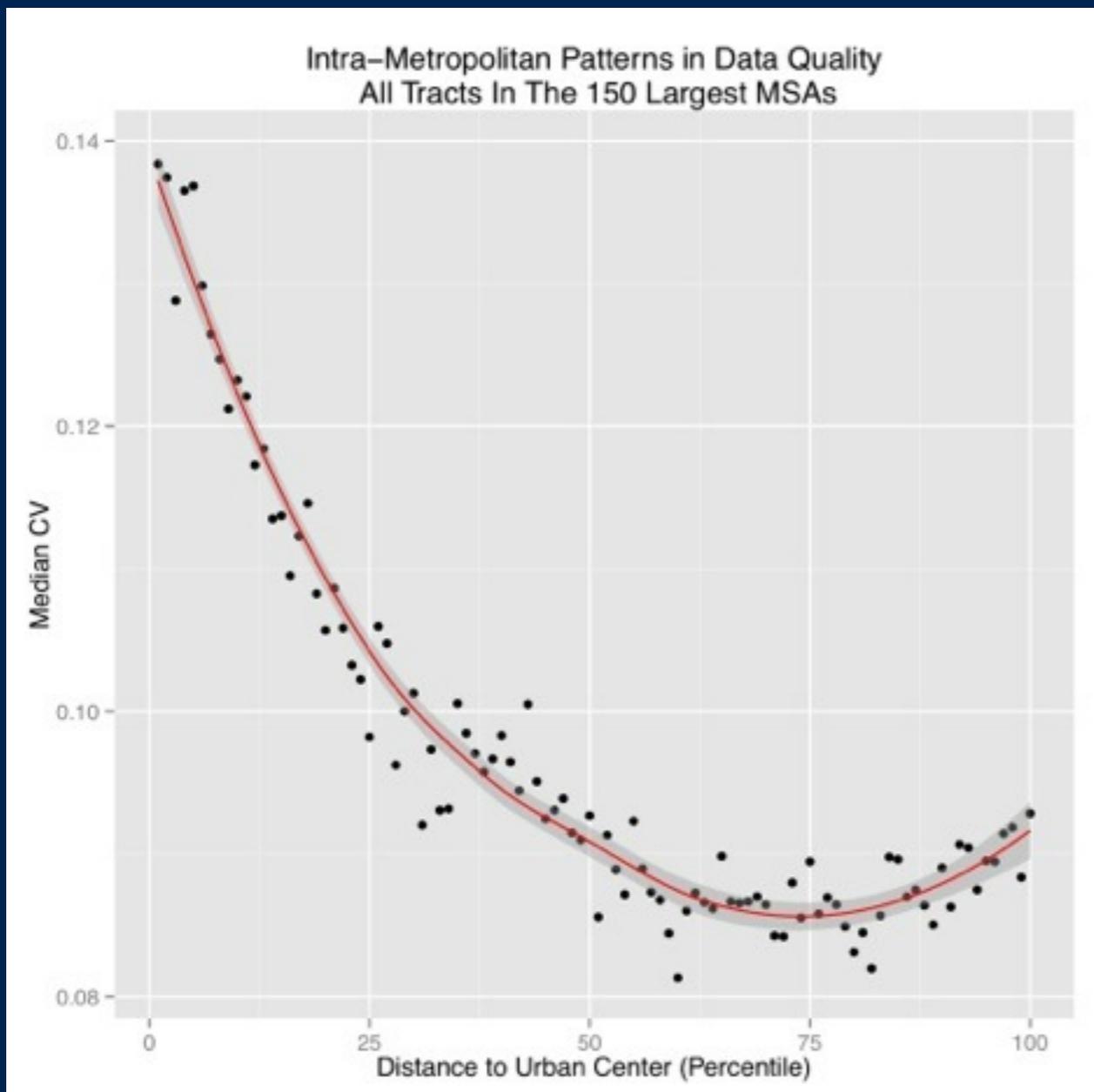
# Statistical Geographies

- Since the 1920's US cities have been divided, like jigsaw puzzles into "statistical geographies" like census tracts & block groups.
- Geographic entities that exist solely for the purposes of statistical tabulation.
- Created by local committees/census, stable over time, population thresholds.
- Important for ACS data users.

# ACS Geographies

- For nearly a century Census Tracts/Block Groups have been designed around population thresholds
- We are proposing a new kind of statistical geography for the ACS designed around data quality thresholds
  - Data for ACS geographies should have margins of error that meet some predefined usability threshold

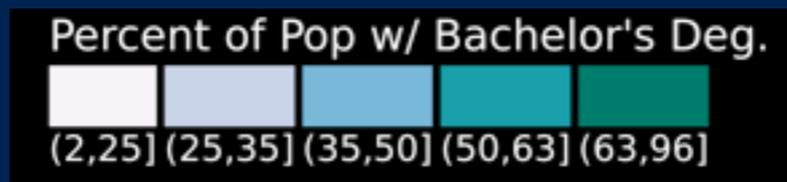
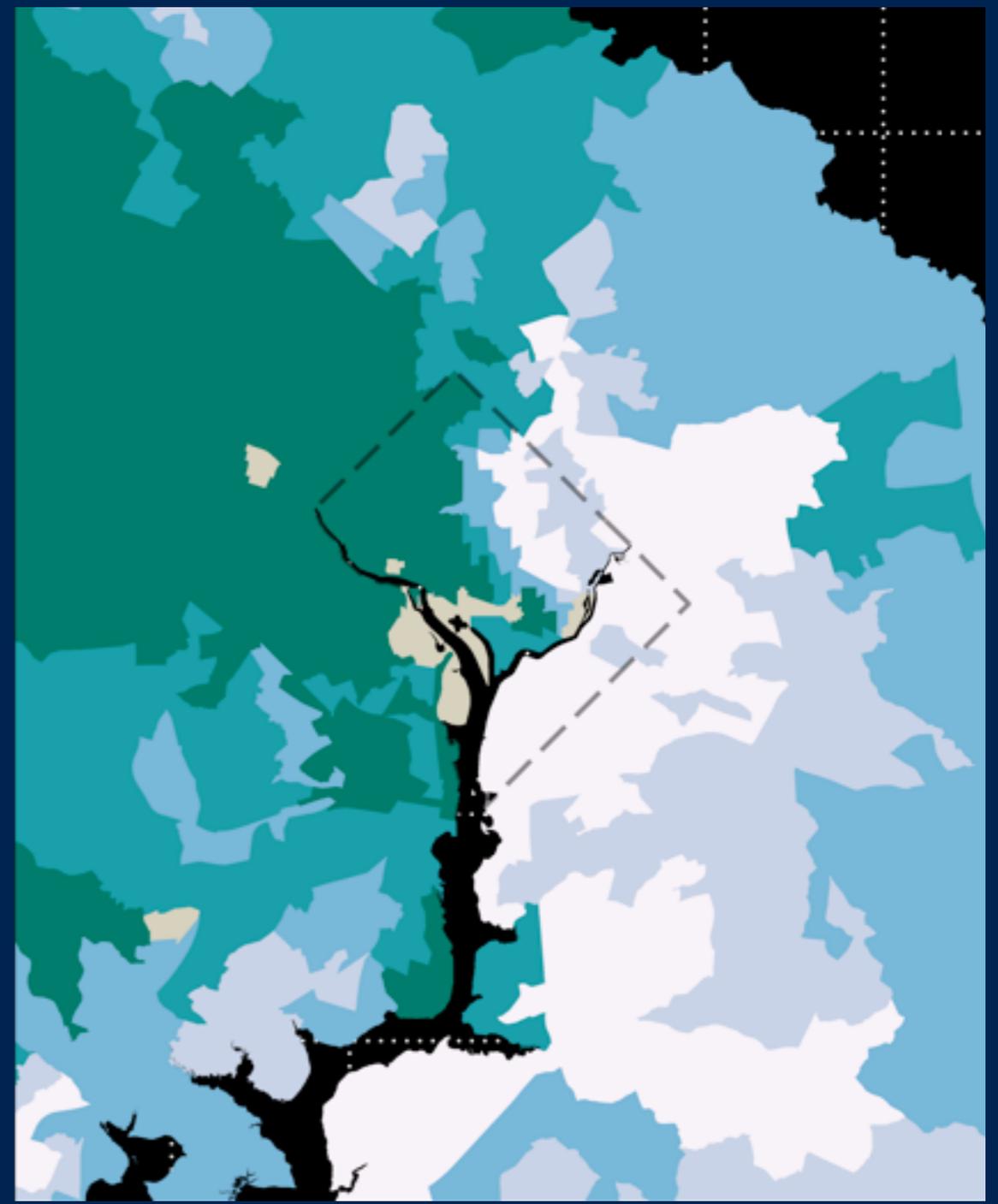
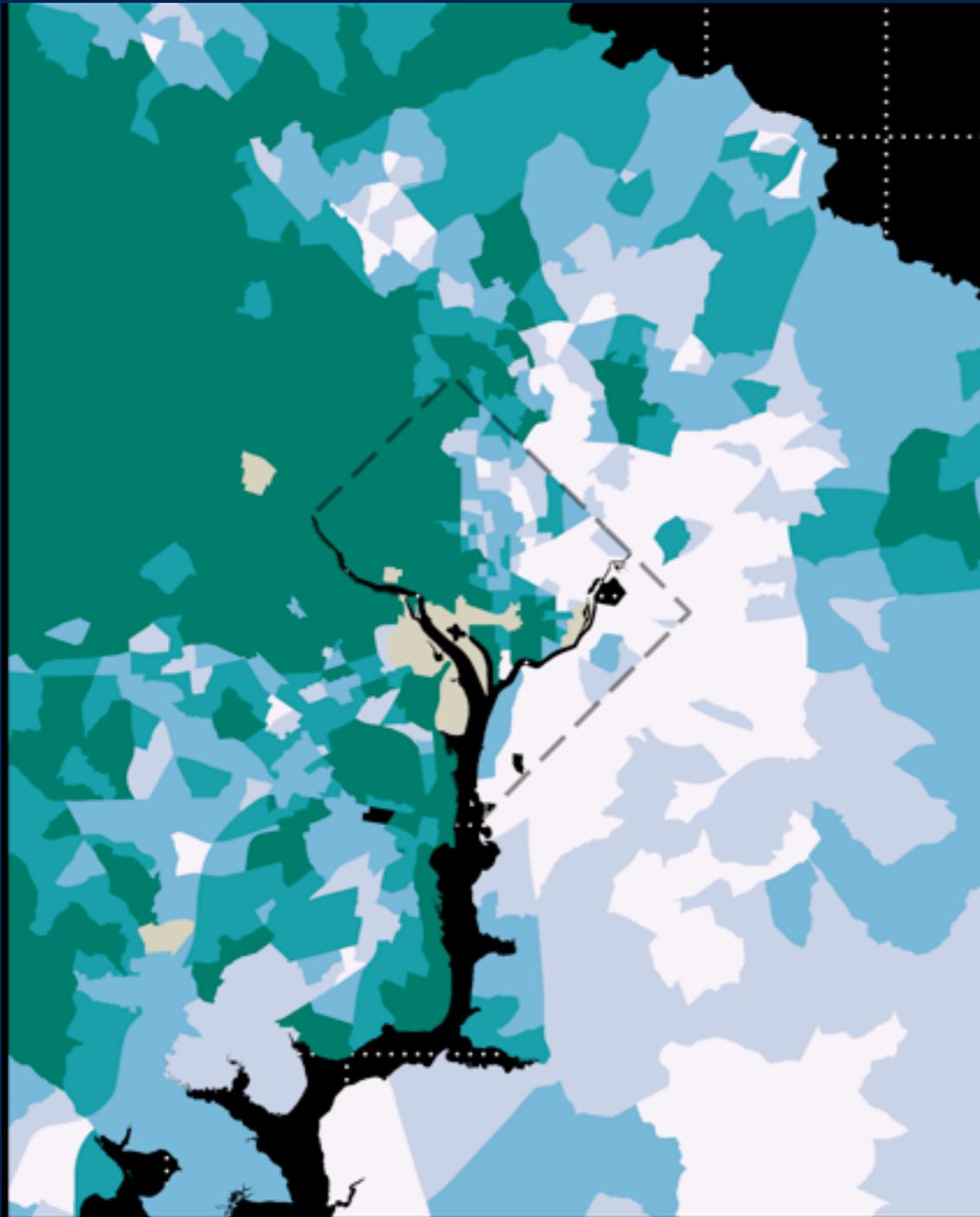
# Social and Geographic Patterns in Estimate Quality



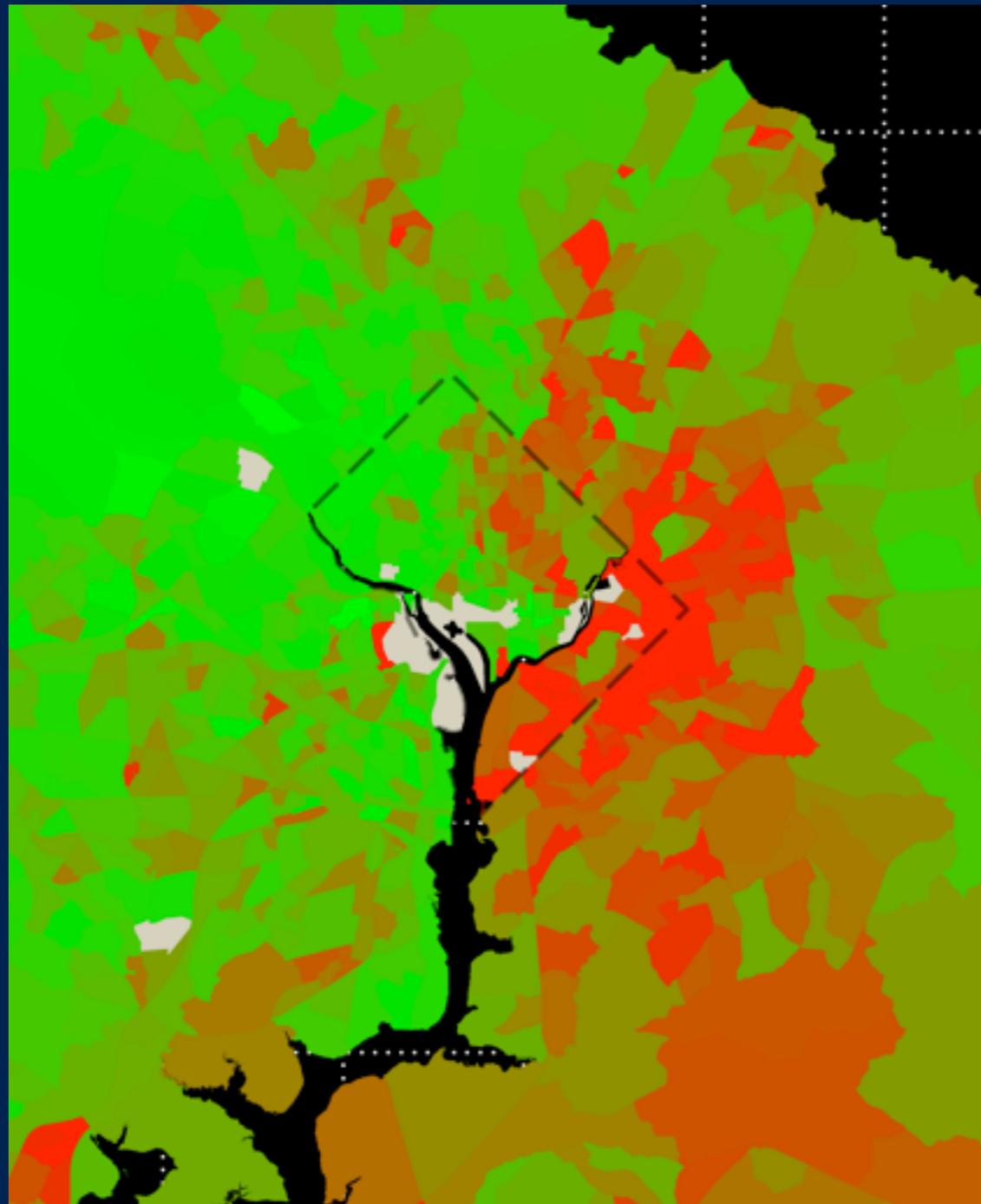
Median Household Income: 2011 ACS Tracts

# Tracts

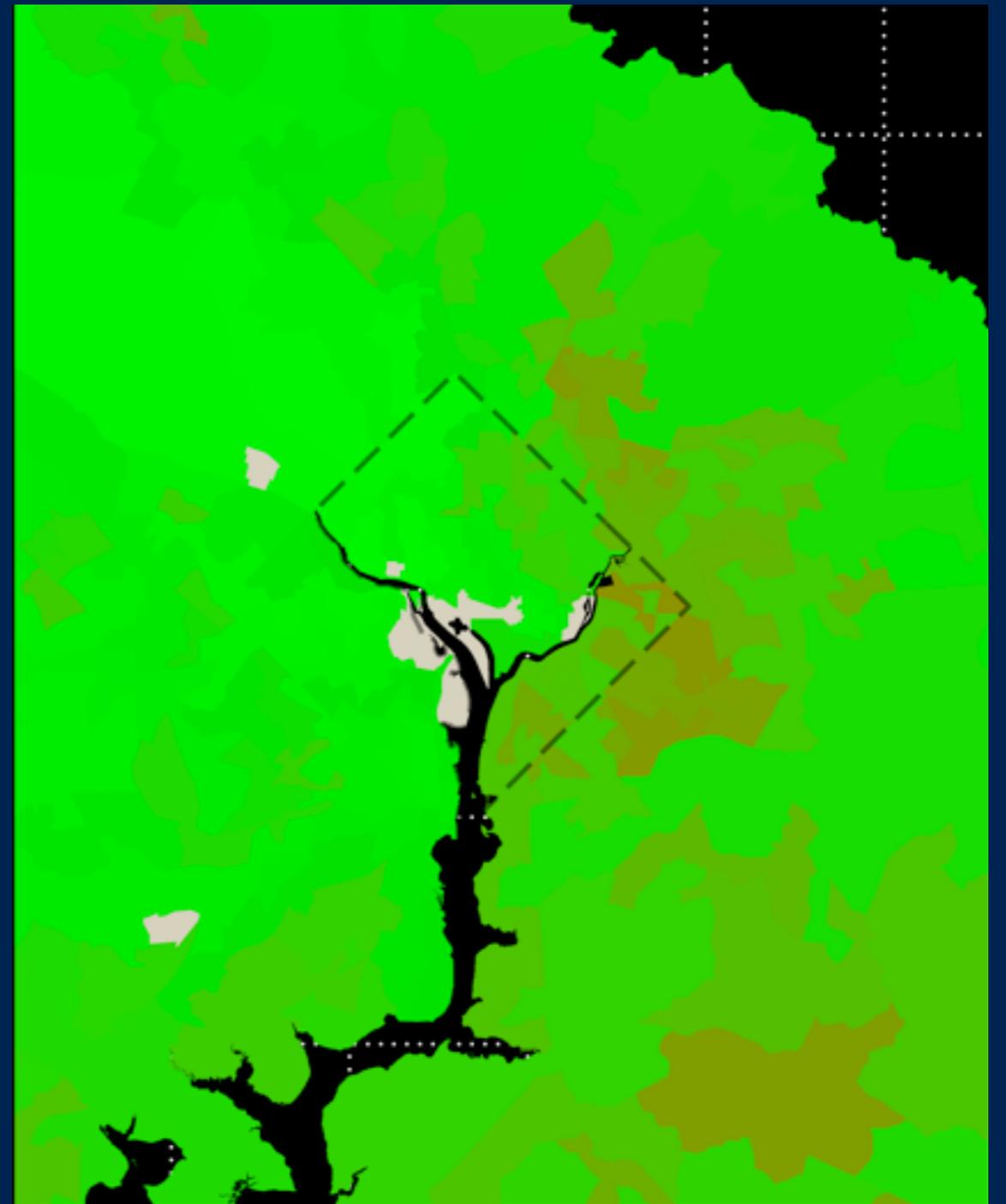
# ACS Geographies



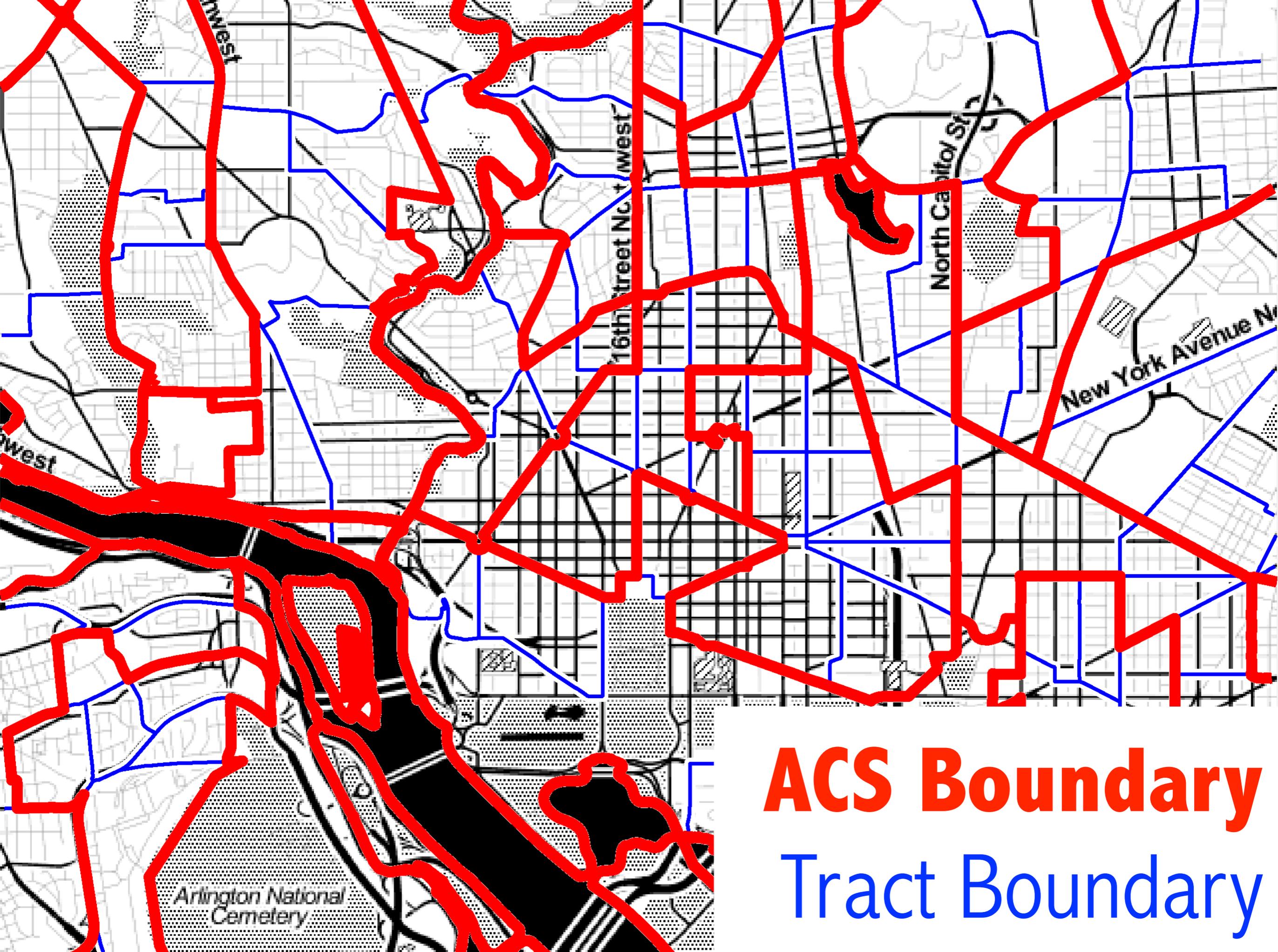
# Tracts



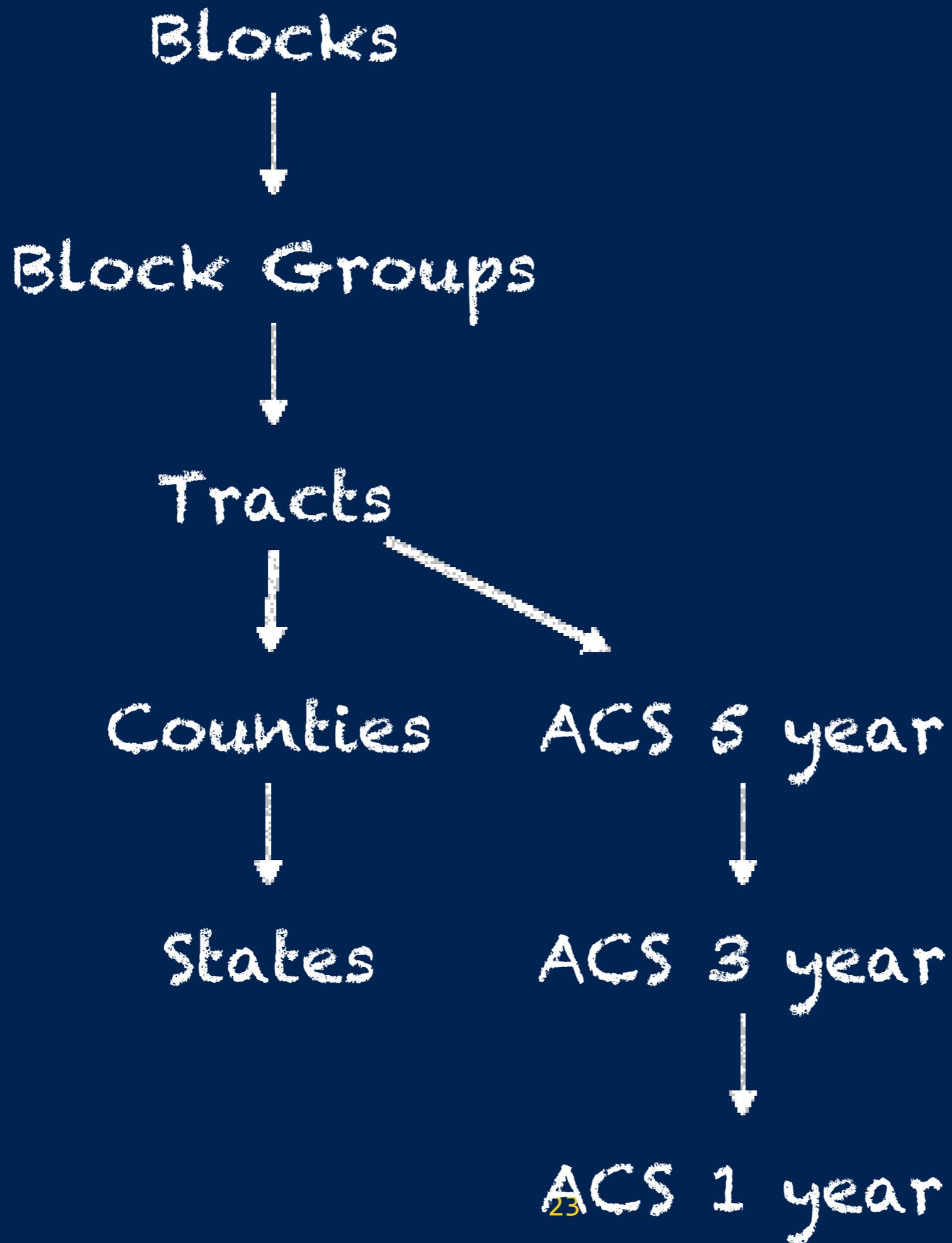
# ACS Geographies



Areas that are reddish have a CV over 12%



**ACS Boundary**  
Tract Boundary



# Conclusions

- Tried to show that there are problems with ACS data. We've written a number of reports and papers that document these problems in more detail.
- Presented the idea of Quality-Based ACS Geographies.
  - Zooming-out for better data.
  - These new geographies don't alter the status-quo and can be efficiently created (free software on GitHub).
  - Provide usable 1,3, and 5 year estimates to the entire US.
  - We have created 5yr geographies for a bunch of cities.
  - Collaborators for evaluation and dissemination.
- Willing to trade geographic detail for better estimates?

# References

1. Spielman, S.E. and Folch, D.F. (2015) Reducing Uncertainty in the American Community Survey through Data-Driven Regionalization. *PLoSOne* ([code](#))
2. Spielman, S.E., Folch, D., Nagle, N. (2014) Patterns and Causes of Uncertainty in the American Community Survey. *Applied Geography* (replication data and code)
3. Folch, D. and Spielman, S.E. (2014) Identifying Regions based on Flexible User Defined Constraints. *International Journal of Geographic Information Science*.
4. Folch, D.C., Arribas-Bel, D., Koschinsky, J., and Spielman, S.E. (2014). Uncertain Uncertainty: Spatial Variation in the Quality of American Community Survey Estimates. Arizona State University, Geoda Center Working Paper Series.

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[github.com/geoss/ACS\\_Regionalization](https://github.com/geoss/ACS_Regionalization)