# Time Series of ACS Data A New Resource from IPUMS NHGIS

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ACS Data Users Conference May 15, 2019









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IPUMS provides census and survey data from around the world integrated across time and space. IPUMS integration and documentation makes it easy to study change, conduct comparative research, merge information across data types, and analyze individuals within family and community context. Data and services available free of charge.



U.S. Census and American Community Survey microdata from 1850 to the present.

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Health survey data for Africa and Asia, including harmonized data collections for DHS and PMA2020.

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Historical and contemporary time use

data from 1965 to the present.

**IPUMS** TIME USE



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Current Population Survey microdata including basic monthly surveys and

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Health survey data from the National Health Interview Survey from the 1960s to the present.



Census microdata covering 82 countries from 1960 to the present. IPUMS NAPP offers microdata from the 19th and early 20th centuries.

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### **CALENDAR**

Allied Social Sciences Association (ASSA) January 5-7, 2018

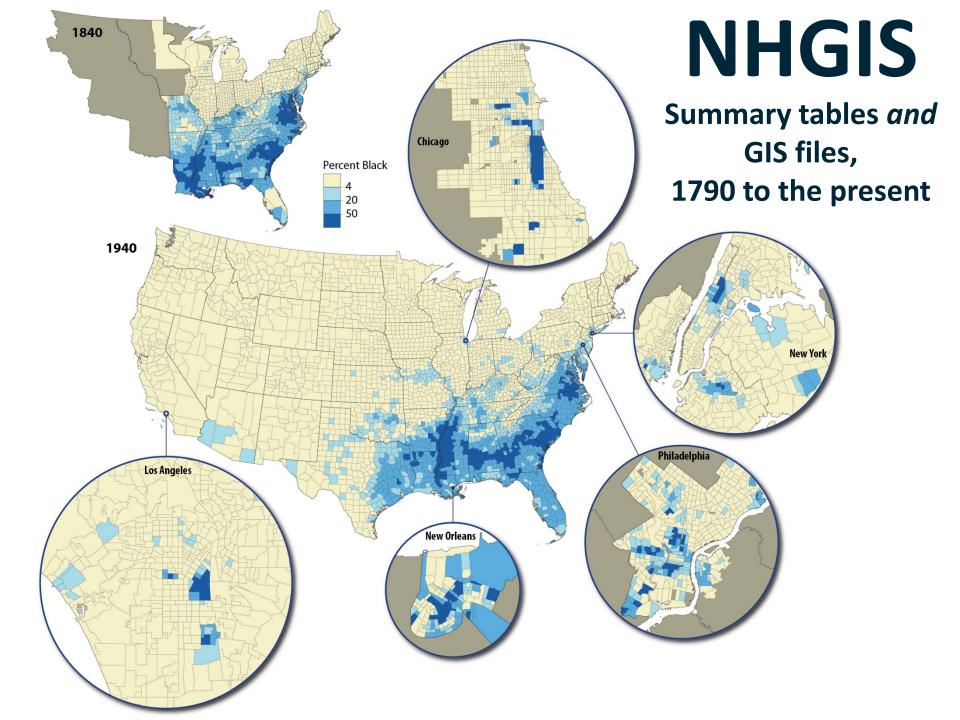
American Association of Geographers (AAG)

Philadelphia, PA

April 10 - 14, 2018 New Orleans, LA

Population Association of America (PAA)

> April 26 - 28, 2018 Denver, CO



# TIME SER Summary data 1990 2008-

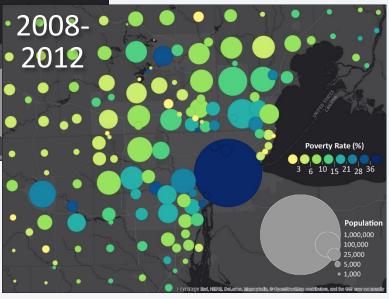
# **TIME SERIES TABLES**

Summary data linked across time

with consistent codes & categories

# Detroit Area Poverty Rates

by County Subdivision









https://www.nhgis.org









NHGIS **GEOMARKER** NATIONAL HISTORICAL GIS

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### DATA

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RELEASE LOG

### RESEARCH

CITATION AND USE

### DOWNLOAD U.S. CENSUS DATA TABLES & MAPPING FILES

The National Historical Geographic Information System (NHGIS) provides easy access to summary tables and time series of population, housing, agriculture, and economic data, along with GIS-compatible boundary files, for years from 1790 through the present and for all levels of U.S. census geography, including states, counties, tracts, and blocks. *Read more*.

**START HERE:** 

Get Data

### WHAT IS IPUMS?

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# DATA SELECT DATA MY DATA HISTORY

### USER RESOURCES

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GEOGRAPHIC CROSSWALKS

ENVIRONMENTAL SUMMARIES

### **DOCUMENTATION**

TABULAR DATA SOURCES

### TIME SERIES TABLES

1990 BLOCK DATA STANDARDIZED TO 2010 GEOGRAPHY

2000 BLOCK DATA STANDARDIZED TO 2010 GEOGRAPHY

GIS FILES

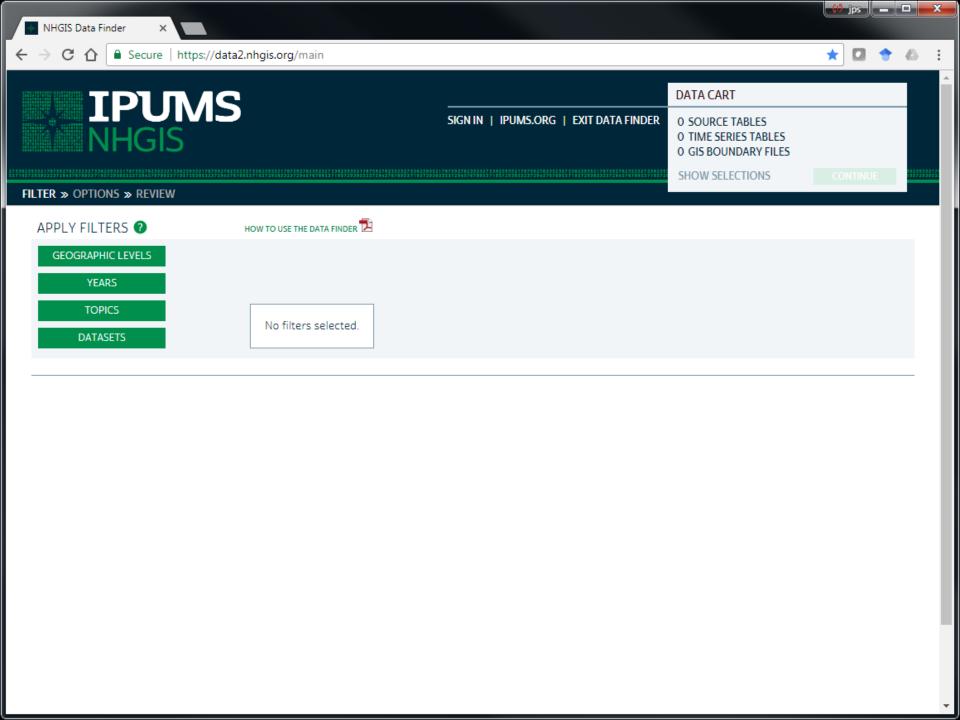
### TIME SERIES TABLES

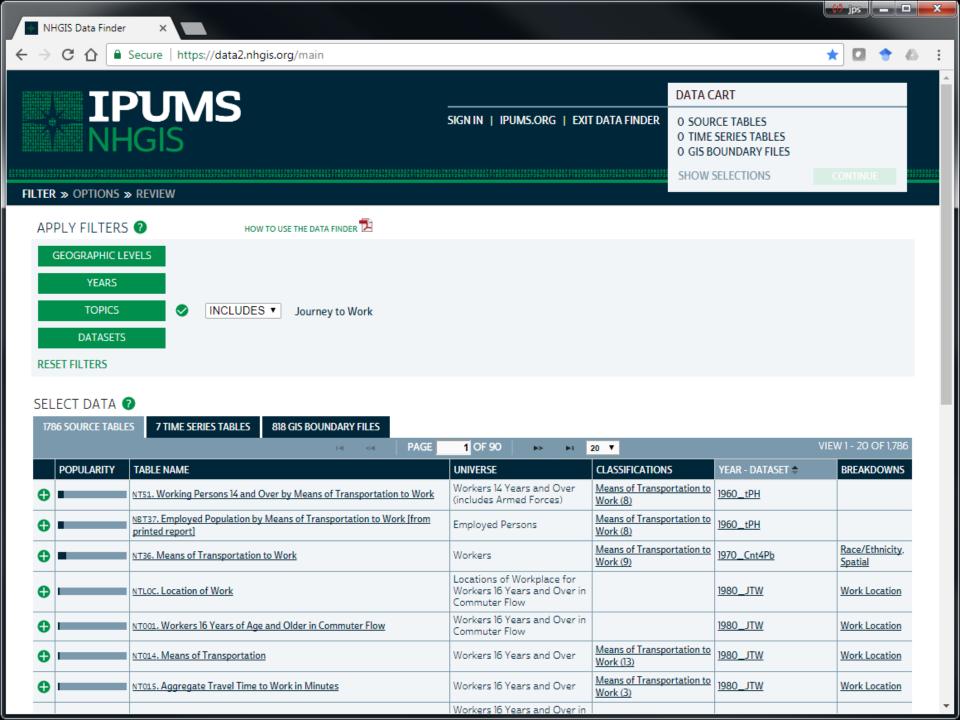
- · What are time series tables?
- · How to access time series tables
- An example: Persons by Sex tables
- · Integration methods
  - · Attribute integration
  - · Geographic integration
    - 1. Nominally integrated tables
    - 2. Geographically standardized tables
- <u>Table coverage</u>
  - <u>Topic coverage</u>
  - Year coverage
  - Geographic coverage
- Table layouts
- · Current table details
- Webinar
- Credits

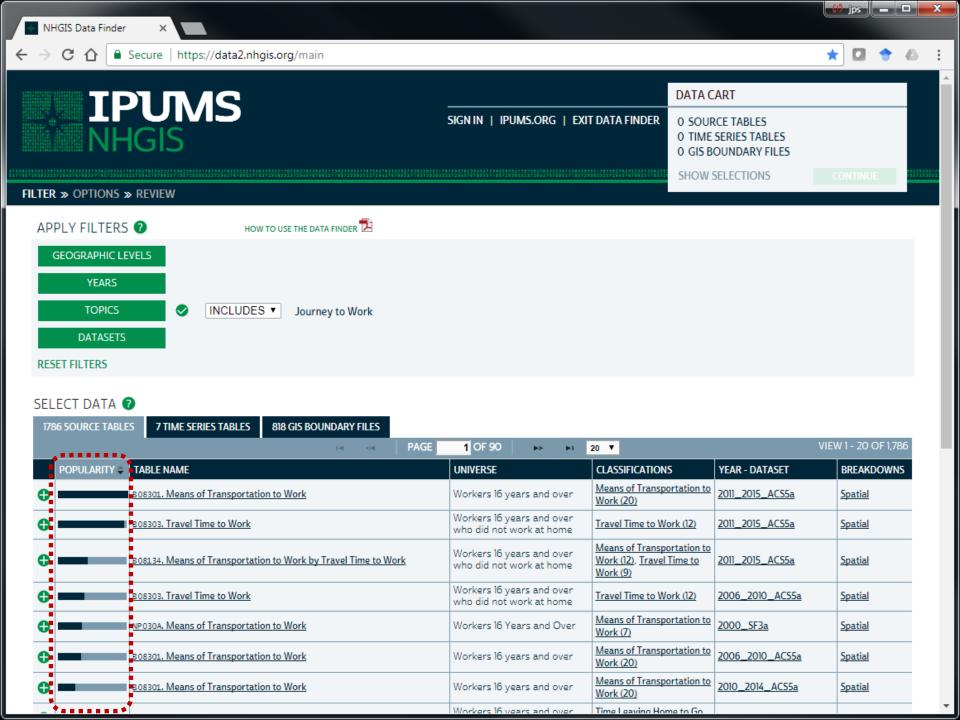
### WHAT ARE TIME SERIES TABLES?

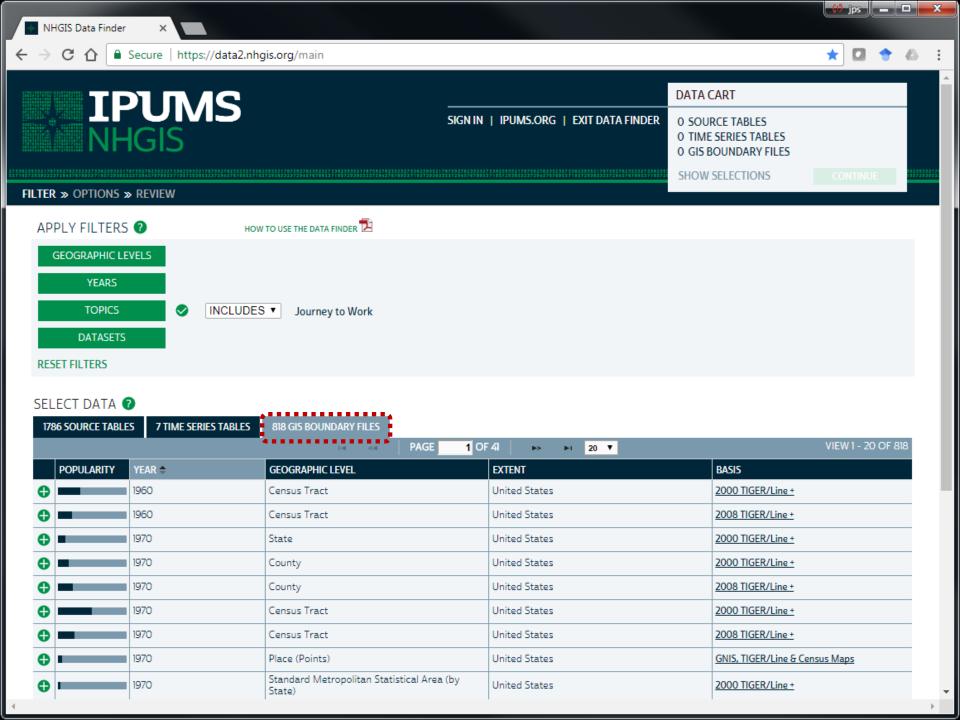
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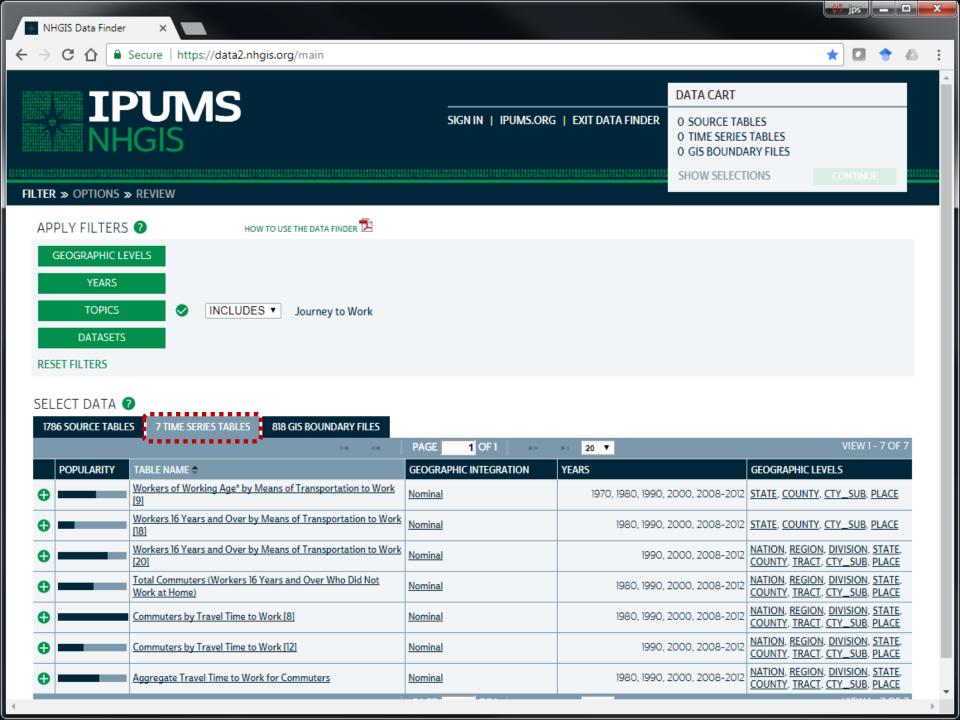
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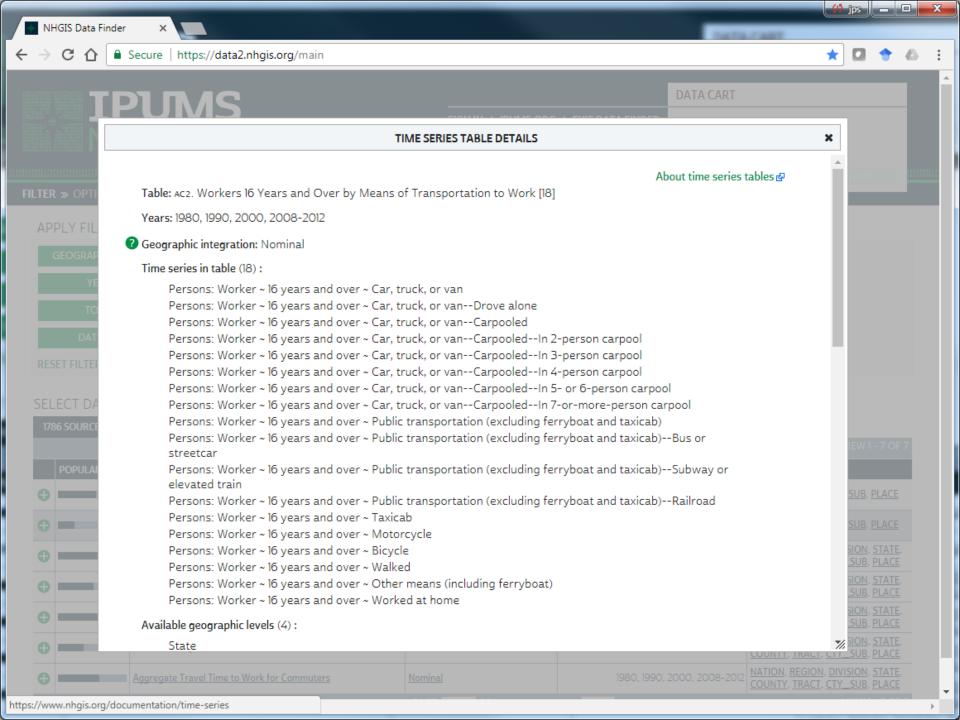


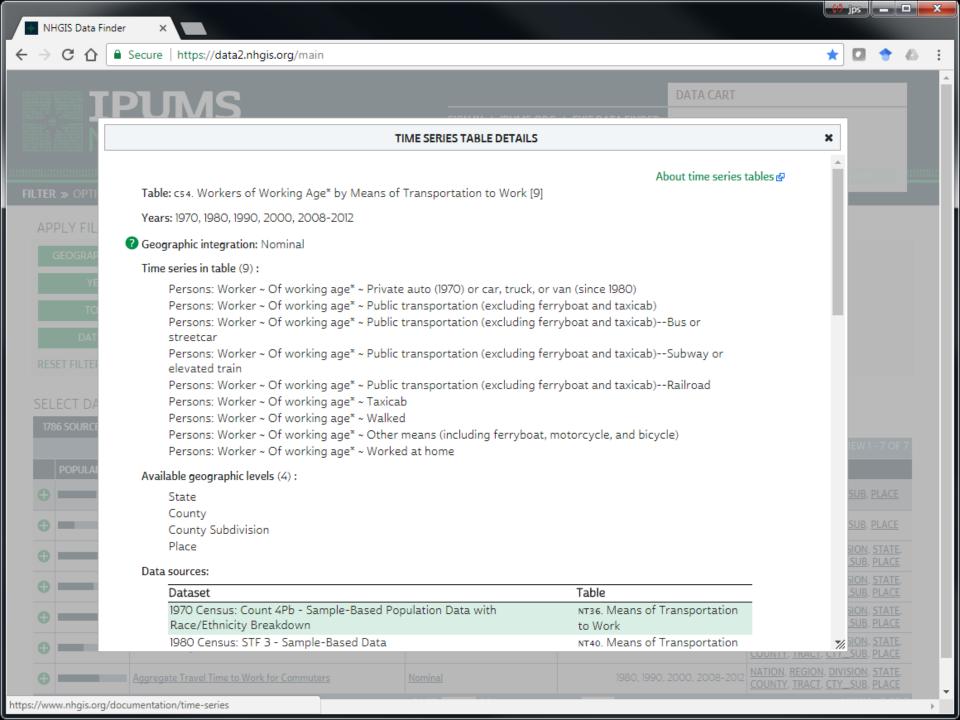


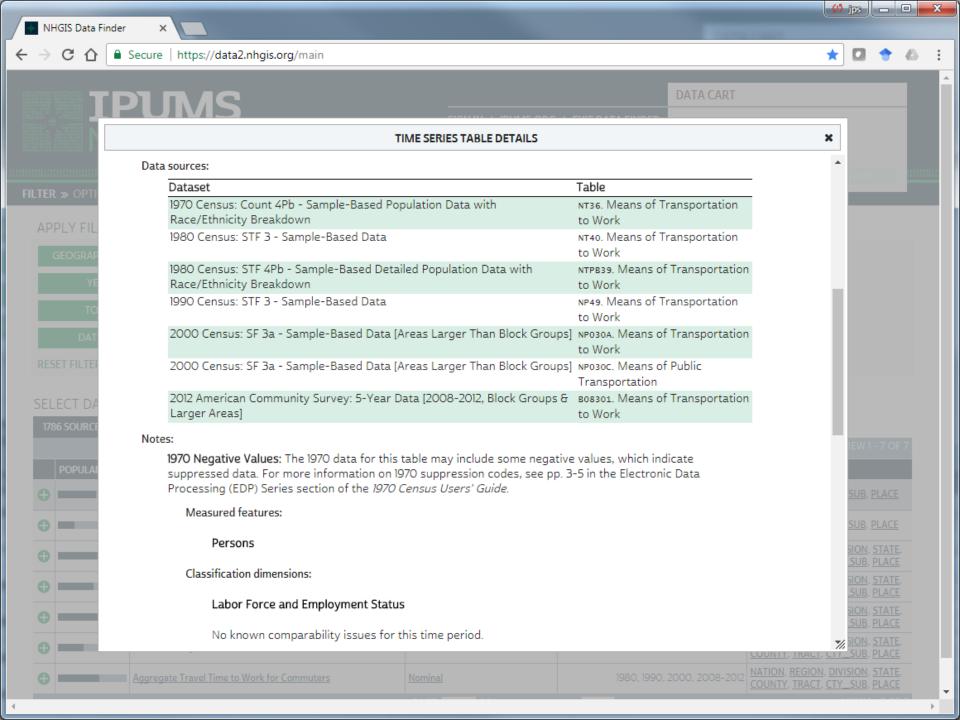


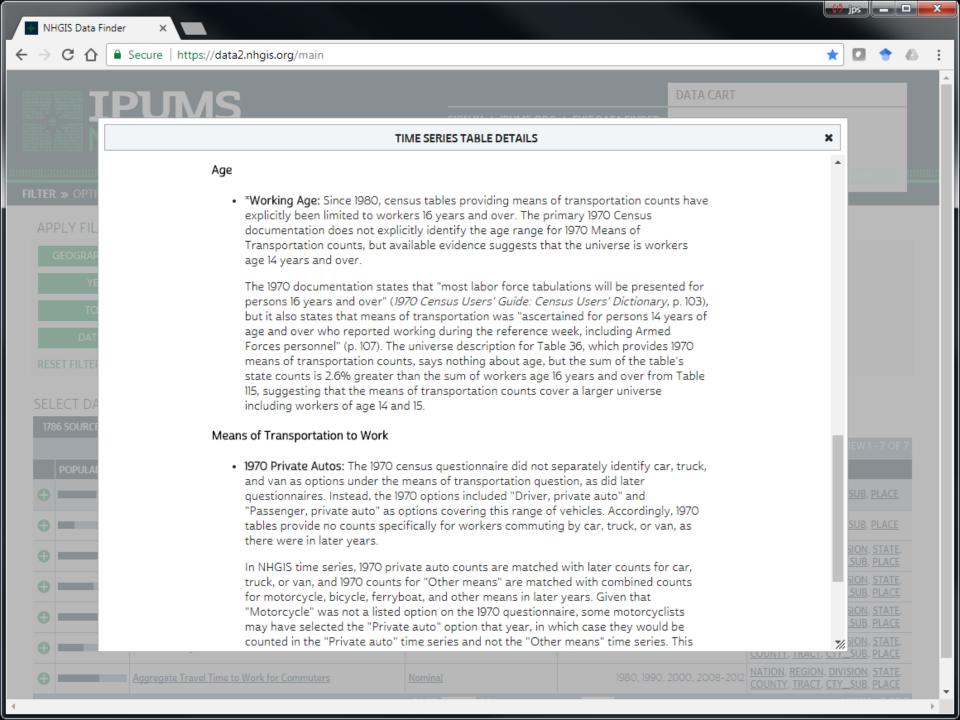


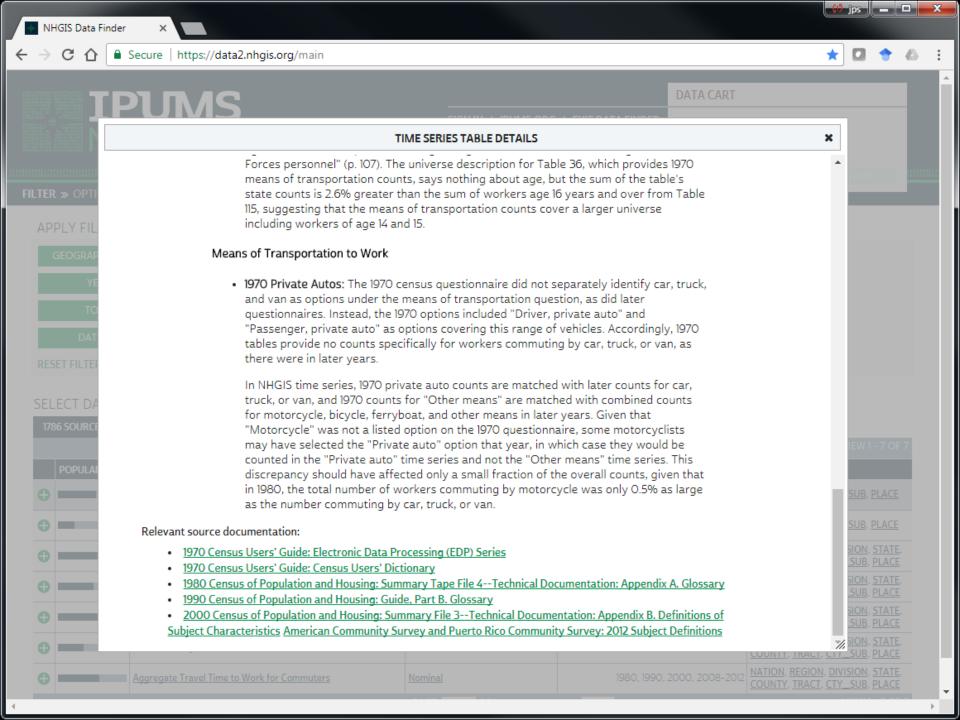


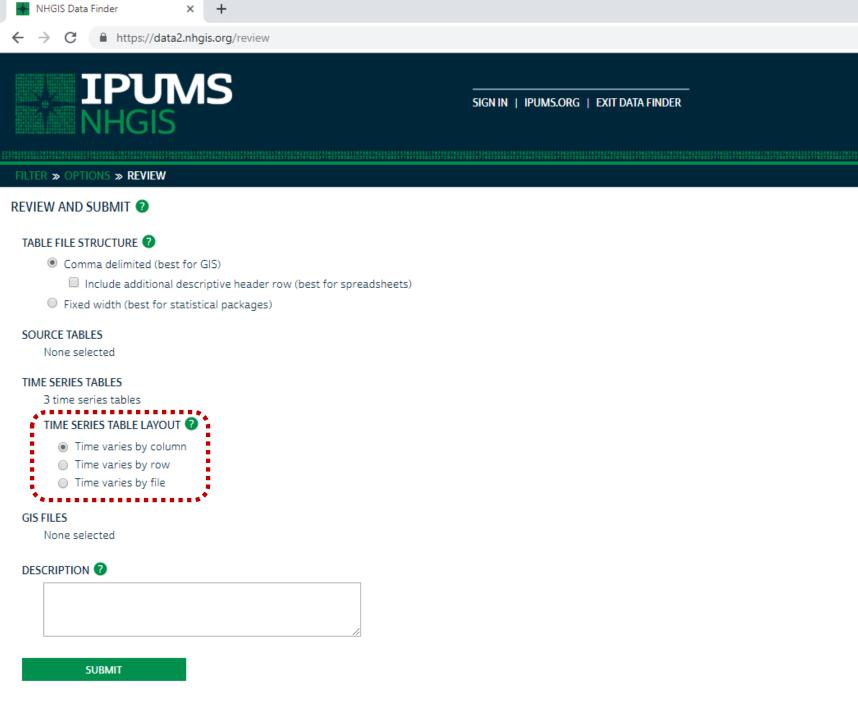


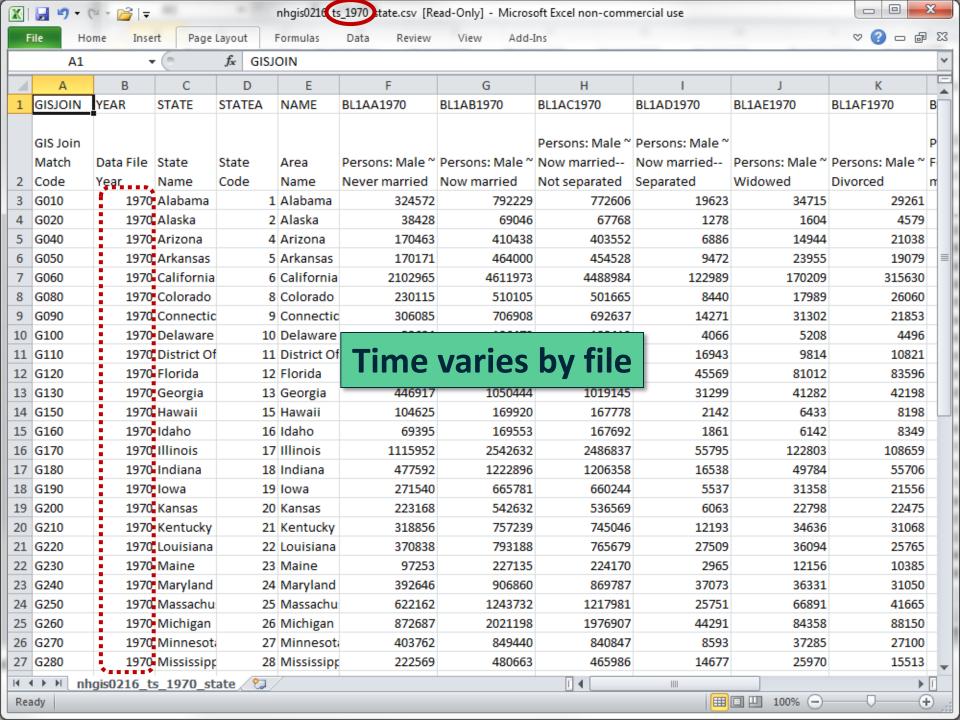


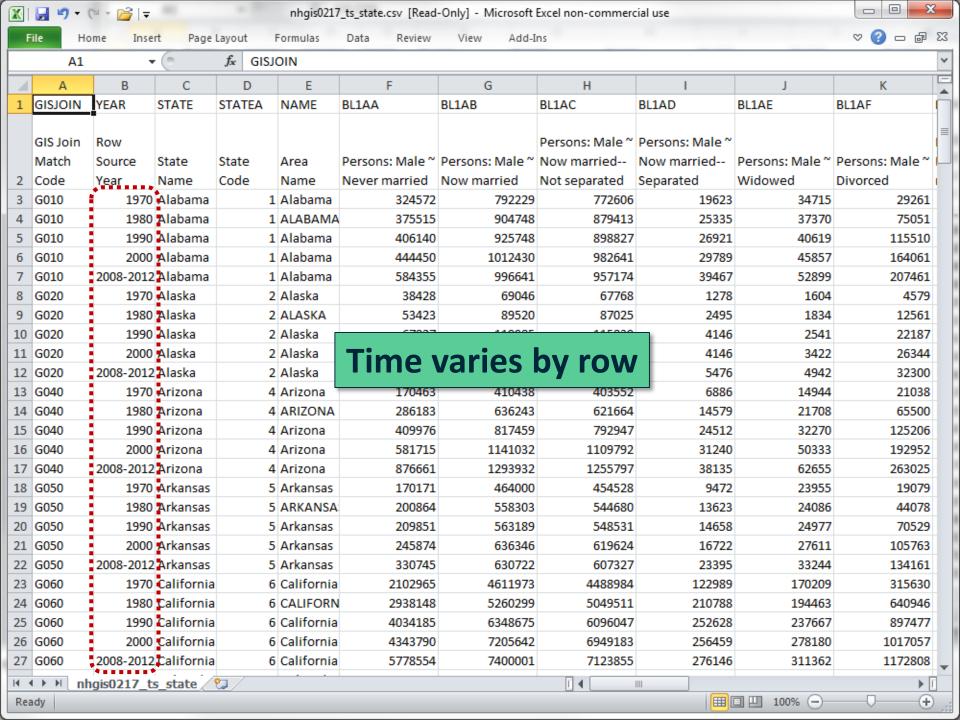


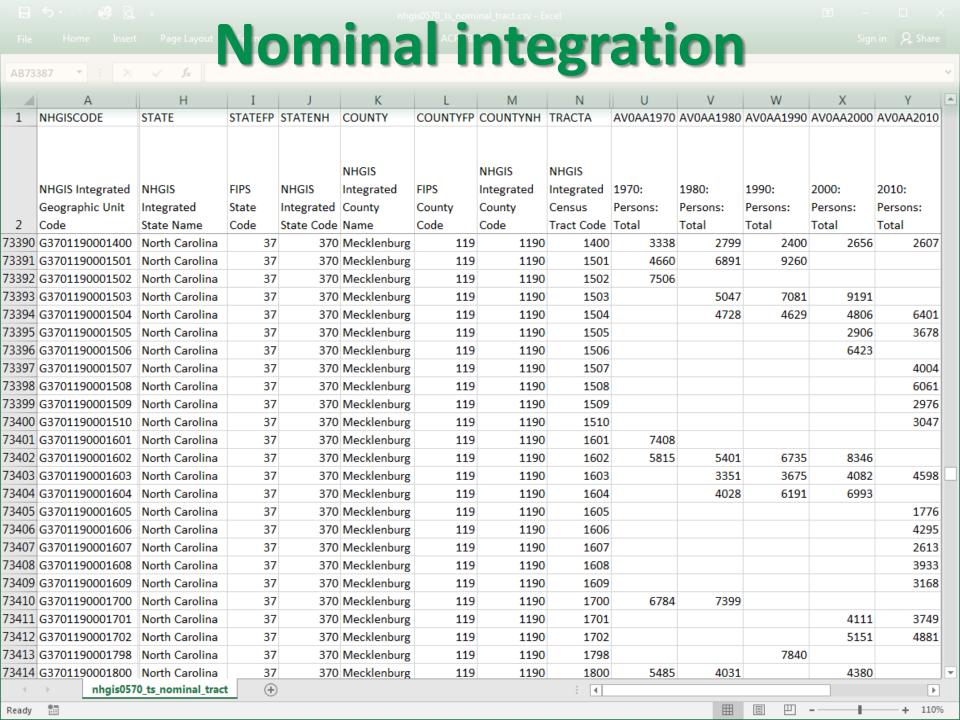












2010:

Persons:

GISJOIN

	G3701190001400	2010													
40216		2010	North Carolina	37	Mecklenburg Co	119	1400	2389.68	2366	2391	2652.31	2640	2653	2607	
49310	G3701190001504	2010	North Carolina	37	Mecklenburg Co	119	1504	4629	4629	4629	4806	4806	4806	6401	
49317	G3701190001505	2010	North Carolina	37	Mecklenburg Co	119	1505	2901	2901	2901	2906	2906	2906	3678	
49318	G3701190001507	2010	North Carolina	37	Mecklenburg Co	119	1507	3419	3419	3419	4791	4791	4791	4004	
49319	G3701190001508	2010	North Carolina	37	Mecklenburg Co	119	1508	3662	3662	3662	4400	4400	4400	6061	
49320	G3701190001509	2010	North Carolina	37	Mecklenburg Co	119	1509	3213	3213	3213	3229	3229	3229	2976	
49321	G3701190001510	2010	North Carolina	37	Mecklenburg Co	119	1510	3146.1	3146	3211	3194.36	3194	3367	3047	
49322	G3701190001603	2010	North Carolina	37	Mecklenburg Co	119	1603	3660	3660	3660	4065	4065	4065	4598	
49323	G3701190001605	2010	North Carolina	37	Mecklenburg Co	119	1605	1389	1389	1389	1978	1978	1978	1776	
49324	G3701190001606	2010	North Carolina	37	Mecklenburg Co	119	1606	3822	3822	3822	4154	4154	4154	4295	
49325	G3701190001607	2010	North Carolina	37	Mecklenburg Co	119	1607	1524	1524	1524	2214	2214	2214	2613	
49326	G3701190001608	2010	North Carolina	37	Mecklenburg Co	119	1608	3872	3872	3872	4321	4321	4321	3933	
49327	G3701190001609	2010	North Carolina	37	Mecklenburg Co	119	1609	2251.16	1687	2334	2445.55	2137	2635	3168	
49328	G3701190001701	2010	North Carolina	37	Mecklenburg Co	119	1701	3303	3303	3303	4111	4111	4111	3749	
49329	G3701190001702	2010	North Carolina	37	Mecklenburg Co	119	1702	4537	4537	4537	5151	5151	5151	4881	F
49330	G3701190001801	2010	North Carolina	37	Mecklenburg Co	119	1801	1813.95	1349	1814	1706.96	1702	1707	1249	
49331	G3701190001802	2010	North Carolina	37	Mecklenburg Co	119	1802	2775	2775	2775	2673	2673	2673	2892	
49332	G3701190001910	2010	North Carolina	37	Mecklenburg Co	119	1910	4277	4277	4277	4614	4614	4614	5117	
49333	G3701190001911	2010	North Carolina	37	Mecklenburg Co	119	1911	4613	4613	4613	5041	5041	5041	5441	
49334	G3701190001912	2010	North Carolina	37	Mecklenburg Co	119	1912	5096.84	5014	5661	5506.45	5317	5815	6565	
49335	G3701190001914	2010	North Carolina	37	Mecklenburg Co	119	1914	3295	3295	3295	3965	3965	3965	3485	
49336	G3701190001915	2010	North Carolina	37	Mecklenburg Co	119	1915	4403	4403	4403	5460	5460	5460	6293	
49337	G3701190001916	2010	North Carolina	37	Mecklenburg Co	119	1916	3003.8	2465	3050	3005.23	2508	3009	3725	
49338	G3701190001917	2010	North Carolina	37	Mecklenburg Co	119	1917	3050.2	3004	3589	3294.77	3291	3792	3567	
49339	G3701190001918	2010	North Carolina	37	Mecklenburg Co	119	1918	2842.4	698	3700	3129	3129	3129	3527	
49340	G3701190001919	2010	North Carolina	37	Mecklenburg Co	119	1919	3243.6	2386	5388	3837	3837	3837	3379	¥
4	hhgis0570	0_ts_geog201	.0_tract	)				:	4					<b>•</b>	
Ready	<b>1</b>												-	+ 110%	,

# Geographically standardized time series

- "Short-form" counts only...
  - Race, ethnicity, age, sex, household size & relationships, housing occupancy & tenure
  - Not income, education, employment, ...
- 1990, 2000 & 2010 data for 2010 units
- 10 geographic levels:
  - states, counties, tracts, block groups, county subdivisions, places, congressional districts, CBSAs, urban areas, ZCTAs
- ~1,600 time series in 109 tables





# Nominally integrated time series

- ~5,700 time series in 271 tables
- Years mainly in 1970-2010 range
  - "Long-form" tables use 2008-2012 ACS
  - Total Population back to 1790 & Persons by Sex back to 1820
- 8 geographic levels:
  nation regions divisions states so
  - nation, regions, divisions, states, counties, tracts, county subdivisions, places



# **Extending Through ACS Years...**

- Nominally integrated time series
  - Add all 5-year periods since 2006-2010
  - First batch:
    - 30-50 tables for the most popular ACS subjects
      - Will include both short-form & long-form subjects





O SOURCE TABLES
3 TIME SERIES TABLES
O GIS FILES

DATA CART

SHOW SELECTIONS

CONTINUE

CLEAR X

### FILTER » OPTION5 » REVIEW



### SELECT DATA ?

	PAGE 1 OF 4 → 1 20 \$ VIEW 1 - 20							
	POPULARITY	TABLE NAME †	GEOGRAPHIC INTEGRATION	YEARS	GEOGRAPHIC LEVELS			
1	k	Total Population	Nominal	1970, 1980, 1990, 2000, 2010, ACS	STATE, COUNTY, TRACT, CTY_SUB, PLACE			
)		Total Population	Nominal	1980, 1990, 2000, 2010, ACS	NATION, REGION, DIVISION, STATE, COUNTY, TRACT, CTY_SUB, PLACE			
1		Persons by Sex [2]	Nominal	1970, 1980, 1990, 2000, 2010, ACS	STATE, COUNTY, TRACT, CTY_SUB, PLACE			
1		Persons of Marrying Age* by Sex (2) by Marital Status [6]	Nominal	1970, 1980, 1990, 2000, ACS	STATE, COUNTY, TRACT, CTY_SUB, PLACE			
•		Persons of Marrying Age* by Sex (2) by Marital Status [8]	Nominal	1970, 1990, 2000, ACS	STATE, COUNTY, TRACT, CTY_SUB, PLACE			
)	1	Persons of Marrying Age* by Sex [2] by Marital Status [5] by Age [7]	Nominal	1980, 1990, 2000, ACS	STATE, COUNTY, CTY_SUB			
)	E a	Persons of Marrying Age* by Sex [2] by Marital Status [5] by Age [7]	Nominal	1970, 2000, ACS	STATE, COUNTY, TRACT, CTY_SUB, PLACE			
•		Persons 15 Years and Over by Sex [2] by Marital Status [5] by Age [11]	Nominal	1980, 1990, 2000, ACS	NATION, REGION, DIVISION, STATE, COUNTY, CTY_SUB			



O SOURCE TABLES
3 TIME SERIES TABLES
O GIS FILES

DATA CART

SHOW SELECTIONS CONTINUE

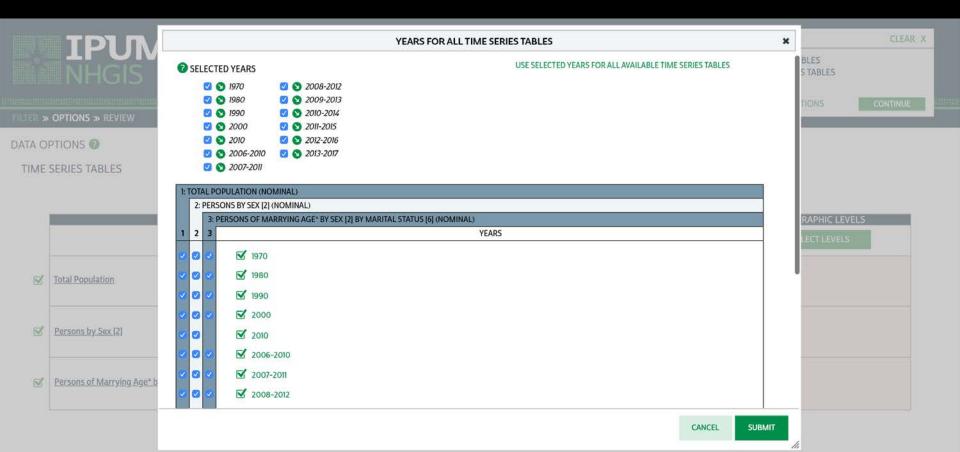
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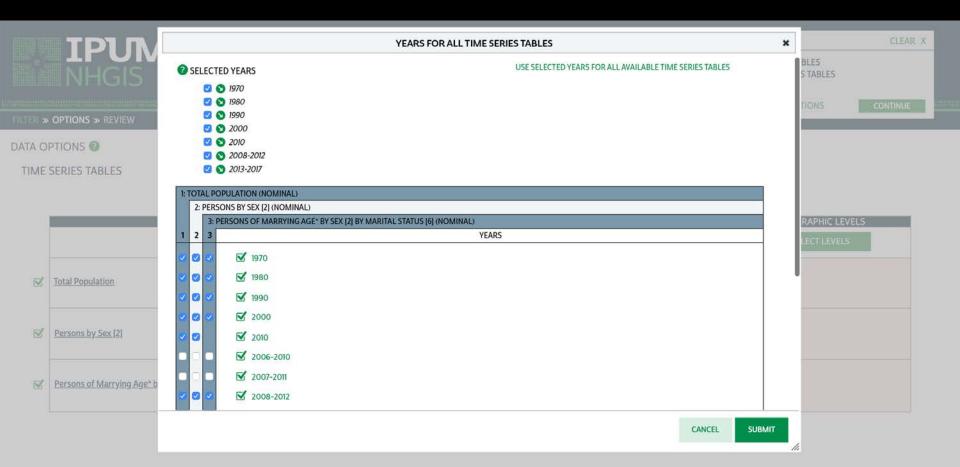
FILTER » OPTIONS » REVIEW

DATA OPTIONS ?

TIME SERIES TABLES

	TABLE	GEOGRAPHIC INTEGRATION	YEARS	GEOGRAPHIC LEVELS
			CHANGE YEARS	SELECT LEVELS
<b>⋖</b>	Total Population	<u>Nominal</u>	1970, 1980, 1990, 2000, 2010, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, 2012-2016, 2013-2017	<u>0 of 5</u>
<b>⋖</b>	Persons by Sex [2]	<u>Nominal</u>	1970, 1980, 1990, 2000, 2010, 2006-2010, 2007-2011, 2008-2012, 2009-2013, 2010-2014, 2011-2015, 2012-2016, 2013-2017	
<b>⋖</b>	Persons of Marrying Age* by Sex [2] by Marital Status [6]	Nominal	12 of 12 12 of 12 12 of 12 12 of 12 12 of 12 12 of 12 13 of 12 14 of 12 15 of 12 16 of 12 17 of 190, 2000, 2006-2010, 2009-2013, 2012-2016, 2013-2017	<u>0 of 5</u>







O SOURCE TABLES
3 TIME SERIES TABLES
O GIS FILES

DATA CART

SHOW SELECTIONS

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FILTER » OPTIONS » REVIEW

DATA OPTIONS ?

TIME SERIES TABLES

	TABLE	GEOGRAPHIC INTEGRATION		YEARS	GEOGRAPHIC LEVELS
				SELECT YEARS	SELECT LEVELS
⋖	Total Population	<u>Nominal</u>	7 of 13	1970, 1980, 1990, 2000, 2010, 2008-2012, 2013-2017	<u>0 of 5</u>
⋖	Persons by Sex [2]	Nominal	<u>7 of 13</u>	1970, 1980, 1990, 2000, 2010, 2008-2012, 2013-2017	<u>0 of 5</u>
≰	Persons of Marrying Age* by Sex [2] by Marital Status [6]	Nominal	<u>6 of 12</u>	1970, 1980, 1990, 2000, 2008-2012, 2013-2017	<u>0 of 5</u>



O SOURCE TABLES
3 TIME SERIES TABLES
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DATA CART

**SHOW SELECTIONS** 

CONTINUE

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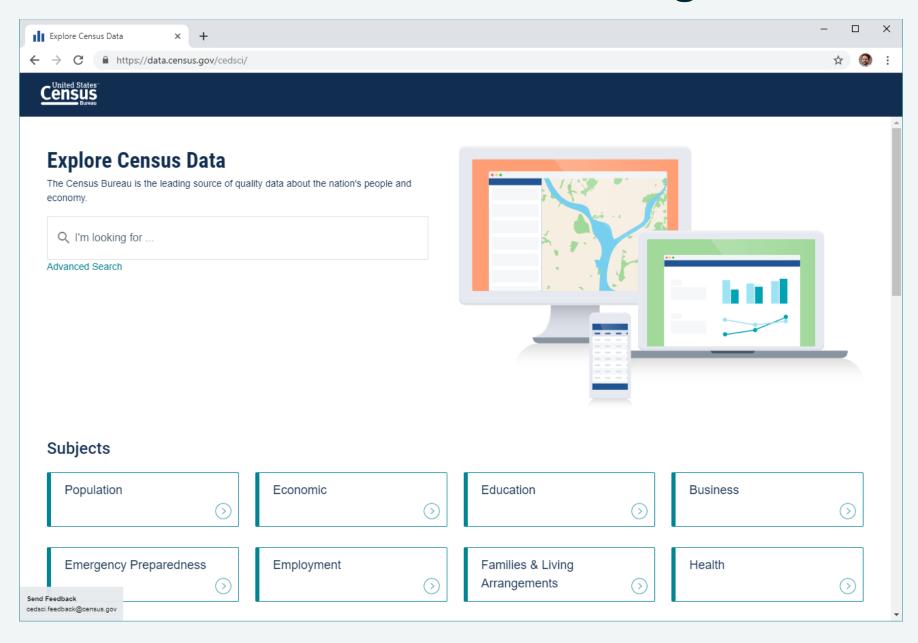
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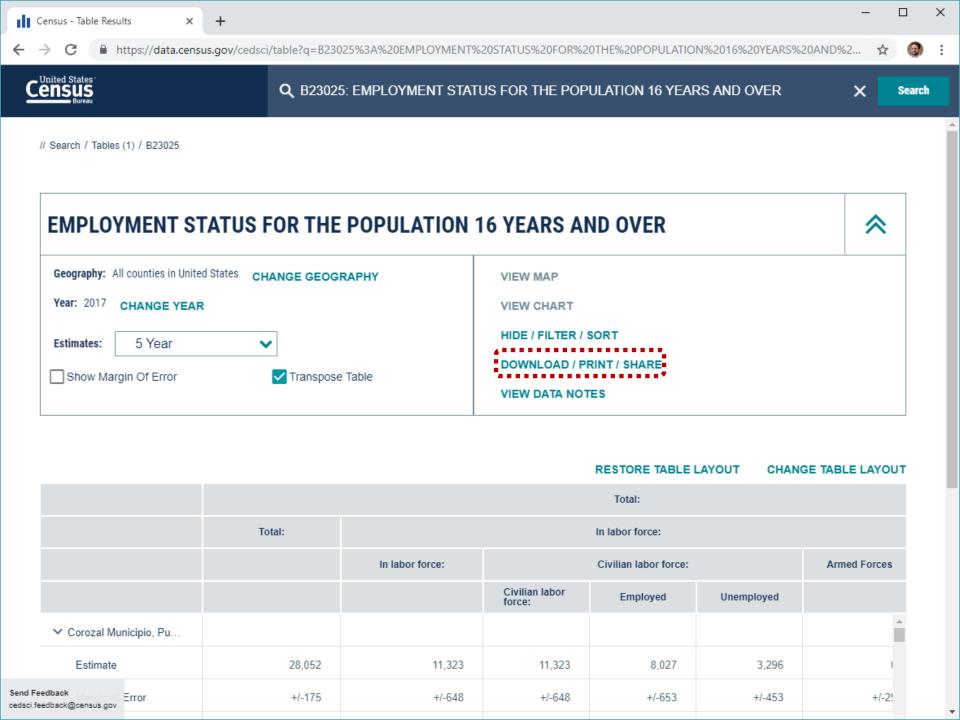
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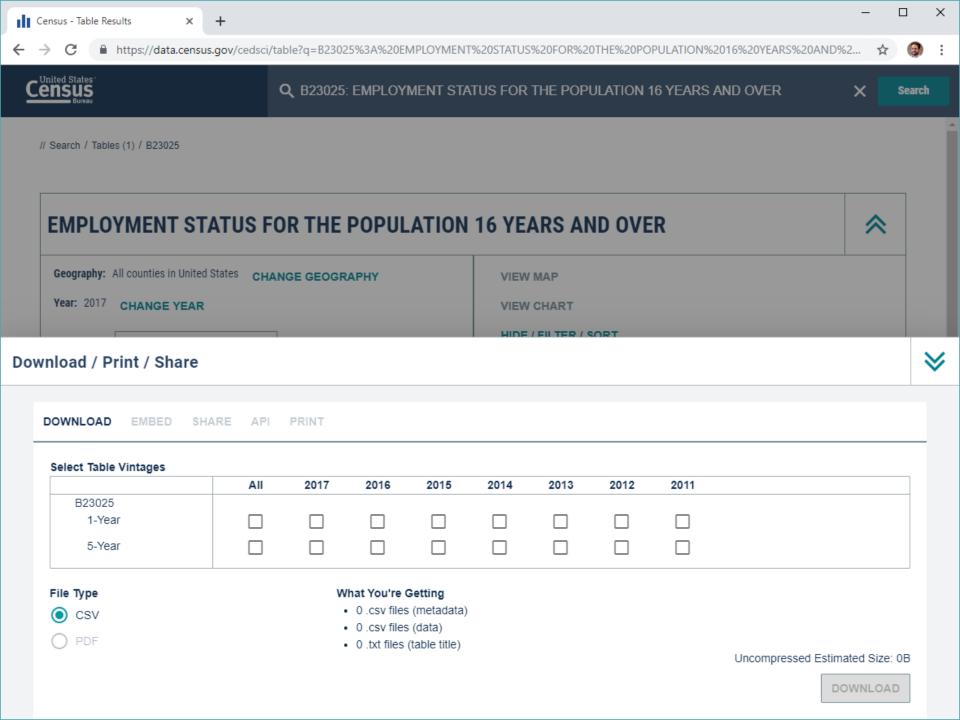
TIME SERIES TABLES

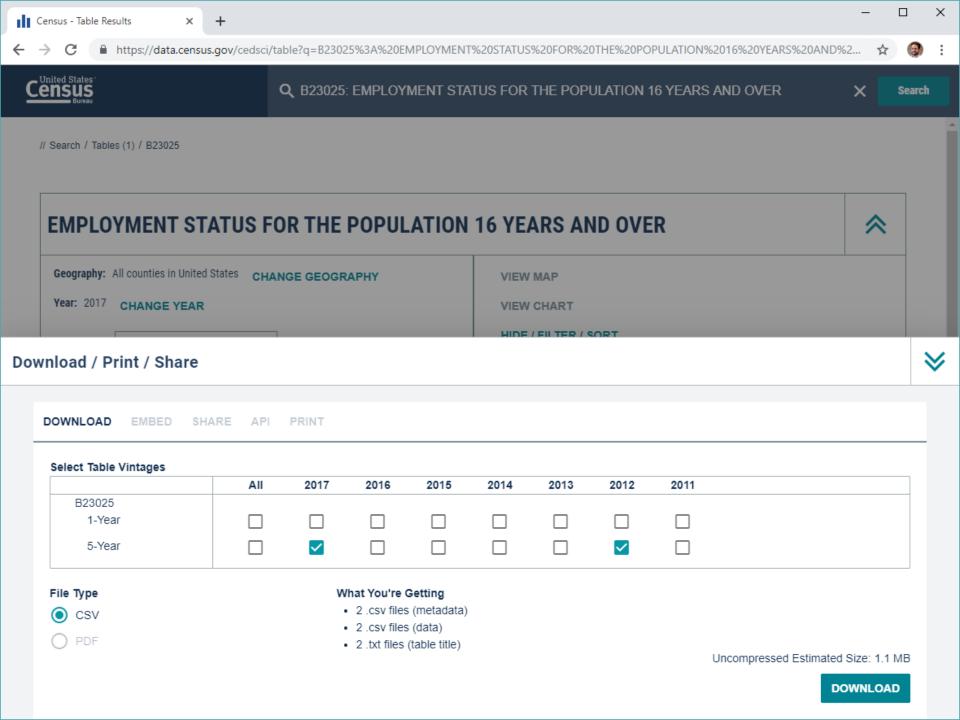
	TABLE	GEOGRAPHIC INTEGRATION	YEARS		GEOGRAPHIC LEVELS	
				SELECT YEARS		SELECT LEVELS
	<u>Total Population</u>	Nominal	<u>7 of 13</u>	1970, 1980, 1990, 2000, 2010, 2008-2012, 2013-2017	<u>2 of 5</u>	State, County
✓	Persons by Sex [2]	Nominal	<u>7 of 13</u>	1970, 1980, 1990, 2000, 2010, 2008-2012, 2013-2017	<u>2 of 5</u>	State, County
✓	Persons of Marrying Age* by Sex [2] by Marital Status [6]	Nominal	<u>6 of 12</u>	1970, 1980, 1990, 2000, 2008-2012, 2013-2017	<u>2 of 5</u>	State, County

# Alternative: data.census.gov









# **Extending Through ACS Years...**

- Geographically standardized time series
  - First, block-group crosswalks
    - E.g., 1990 BGs to 2017 units, including block-based interpolation weights for multiple base characteristics:

Total population

Total households

Total families

Total housing units

Population age # and over, ...

■ Then, new time series tables...





# Acknowledgements

Funding:

Eunice Kennedy Shriver National Institute of Child Health & Human Development (NICHD) [NIH-R01HD057929]

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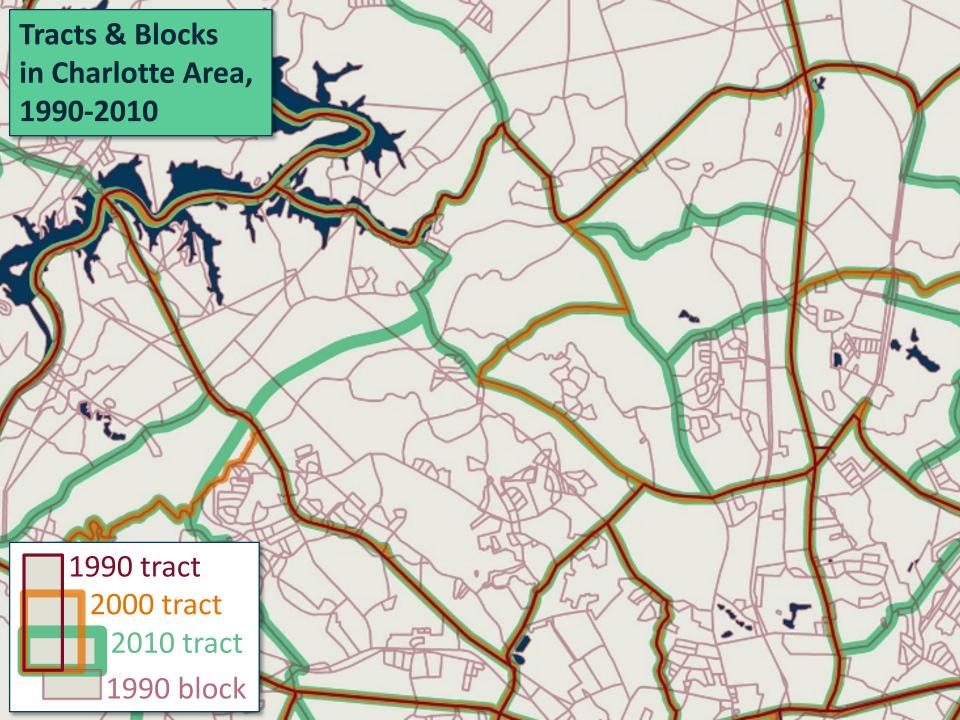


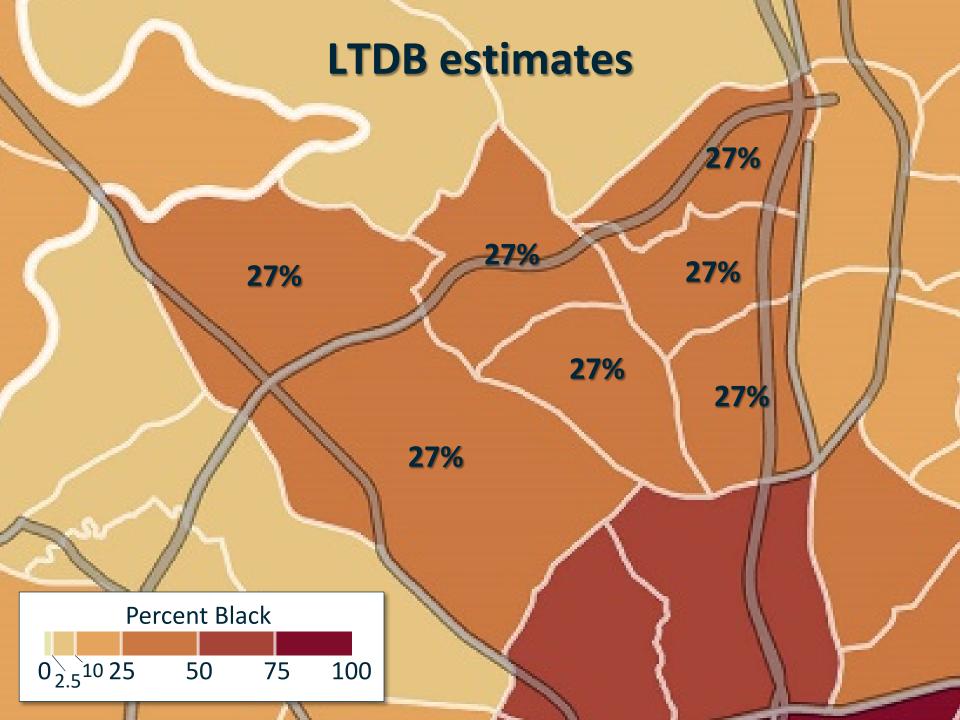
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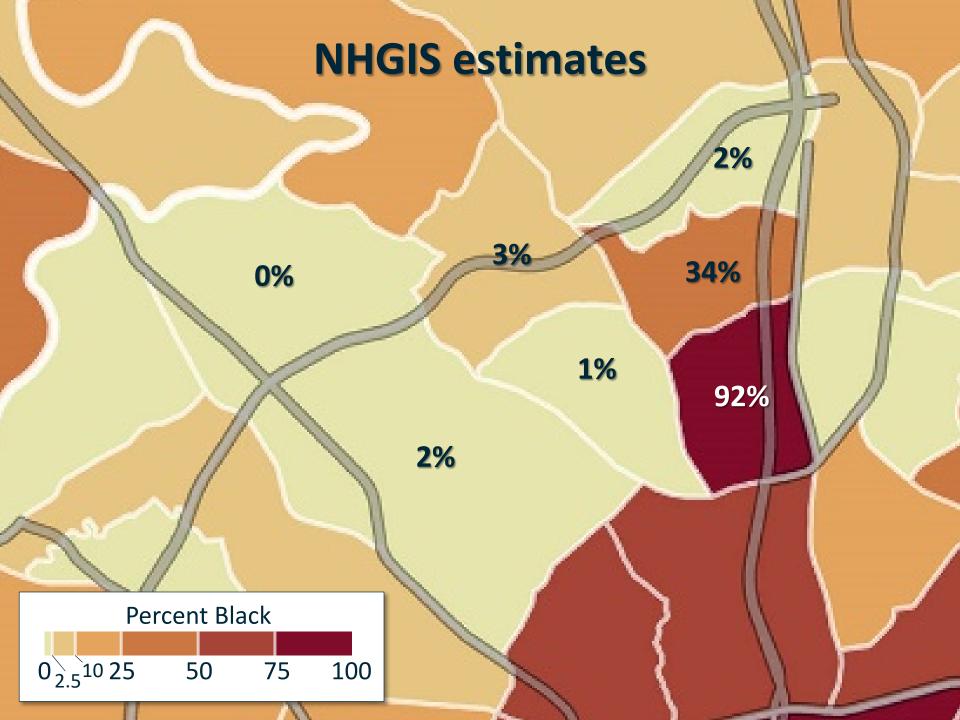
# Sources of geographically standardized data

Geolytics NCDB	LTDB	Social Explorer	NHGIS
Tracts with codes for larger areas	Tracts with codes for larger areas	Tracts, counties, states	10 levels: tracts, BGs, ZCTAs, places
1970–2010	1970–2010	1970–2010	1990–2010
~1,000 variables, specific to source year	83 variables, aligned categories + tract-to-tract crosswalk	1970 Count 4; 1980, 1990, 2000 SF1 & SF3; 2000: 114 aligned tables	~1,600 variables in 109 <i>aligned</i> tables + block-to-block crosswalk
No error bounds	No error bounds	No error bounds	Lower, upper bounds
Tract source, area-weighted (including water!)	Tract source, guided by land areas & 2000 block populations	LTDB crosswalks	Block source, guided by 2000 & 2010 block info, road buffers, land cover

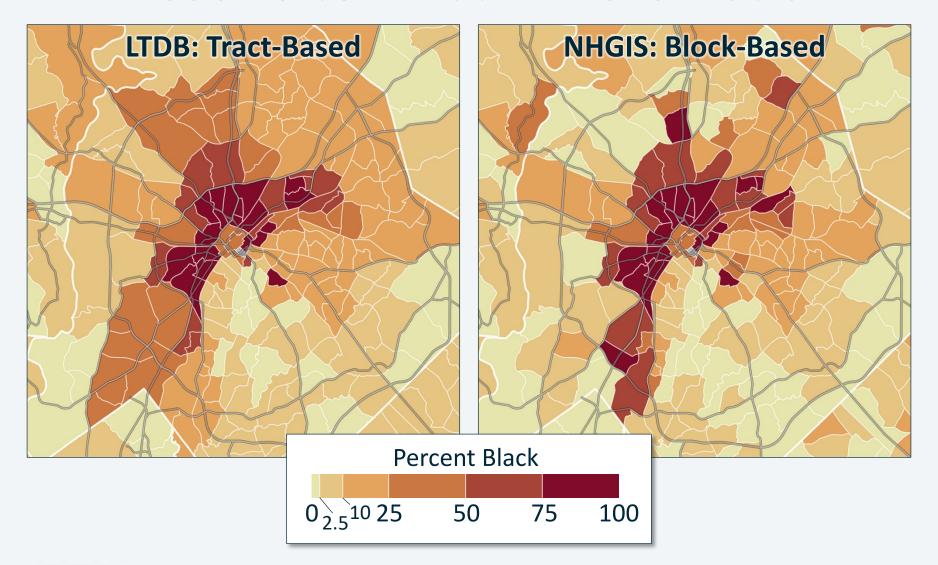








# 1990 Percent Black in 2010 Tracts







# Change in Percent Black, 1990-2010

