Geog 3340: Census Basics

About the US Census Bureau

Mandated by the U. S. Constitution to count the population

1790 First Census count

Used:

- to apportion seats in the U.S. House of Representatives
- to define legislature districts, school district assignment area and other important areas of government
- to distribute federal funds to local, state and tribal governments
- to do research and make decisions such as where to build new roads or what services to provide the elderly.

Both George Washington and Thomas Jefferson expressed skepticism over the final count, expecting a number that exceeded the 3.9 million inhabitants counted in the census.

US Census Bureau Collection Methods

Three basic methods of collection

- Census (100%)
- Survey (sample)
- Administrative records

Two Types of Census by the US

- *Decennial* census: population and housing
  - On the 0's (2000, 2010)
- *Economic* census: business and industry
  - On the 2's and 7's (2002, 2007, 2012)
  -

Census = the enumeration of *entire population or universe* of collection units such as housing units or businesses

Survey Types

Data collected from *sample* of population, that represents the full population

- American Community Survey - monthly
- Current Population Survey - monthly
- Survey of Income and Program Participation - monthly
- American Housing Survey - every 2 years

Administrative Records

Some programs use administrative records (e.g., births and deaths, Medicare, Social Security, IRS, Customs Service)

- Population estimates and projections
- County Business Patterns
- Exports/Imports

Most important for you:

Decennial Census

- Once every 10 years
- 100% count*
- Very small sampling error
- Basic information on population, race/Hispanic ethnicity, age, family structure, housing units, owner/renter housing tenure

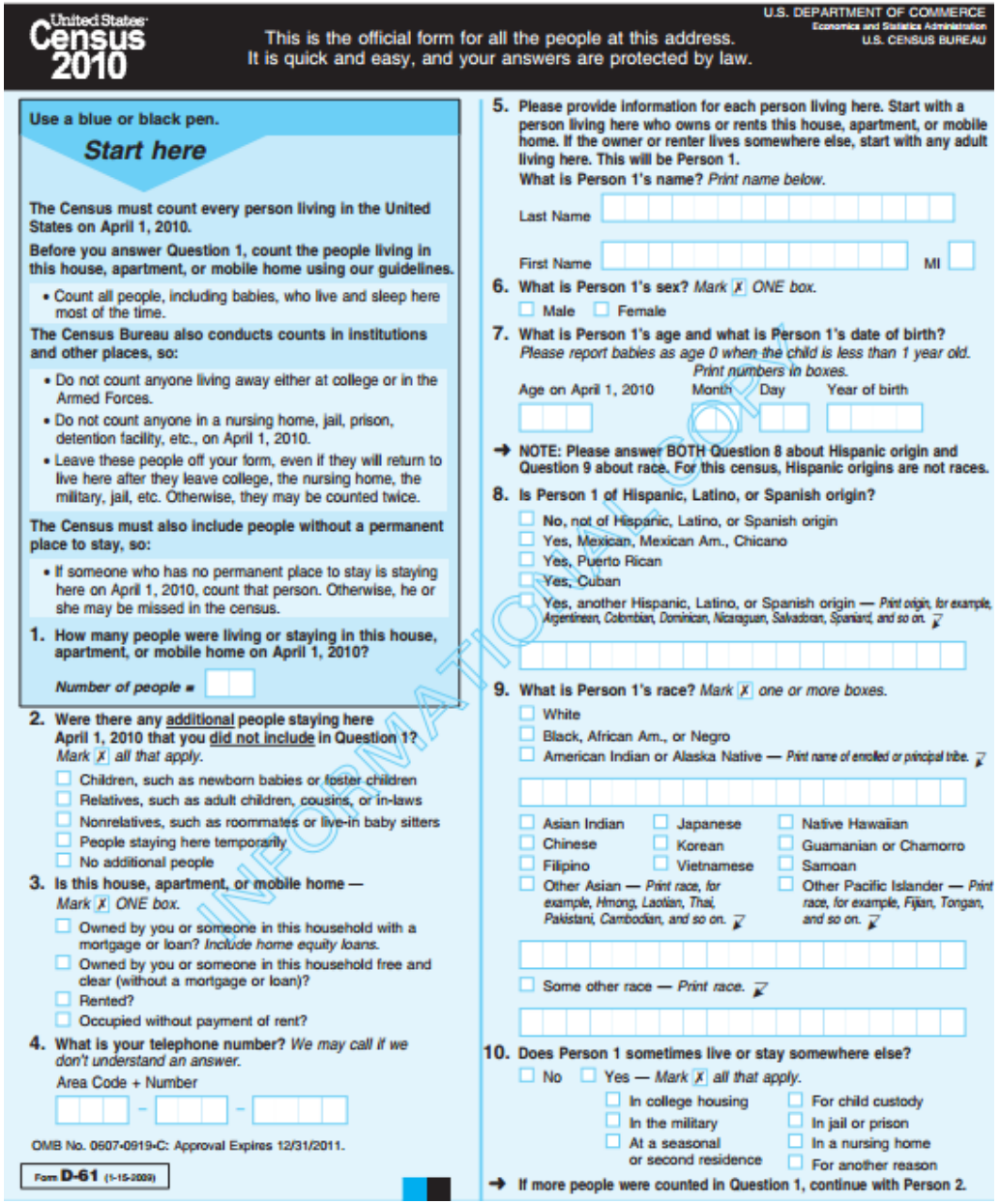
American Community Survey

- Released yearly with rolling multi-year averages
- Sample survey
- High sampling error for small areas (e.g., neighborhood level)
- Detailed information on income, education, commute, place of birth, etc.

We will focus on:

- The 2010 Census
- The American Community Survey (ACS)
- How to map obtain and map census / ACS data
- Understanding sampling error for the ACS

Let's take a look at the 2010 Census form…



United States Census 2010

This is the official form for all the people at this address.
It is quick and easy, and your answers are protected by law.

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

Use a blue or black pen.

Start here

The Census must count every person living in the United States on April 1, 2010.

Before you answer Question 1, count the people living in this house, apartment, or mobile home using our guidelines.

- Count all people, including babies, who live and sleep here most of the time.

The Census Bureau also conducts counts in institutions and other places, so:

- Do not count anyone living away either at college or in the Armed Forces.
- Do not count anyone in a nursing home, jail, prison, detention facility, etc., on April 1, 2010.
- Leave these people off your form, even if they will return to live here after they leave college, the nursing home, the military, jail, etc. Otherwise, they may be counted twice.

The Census must also include people without a permanent place to stay, so:

- If someone who has no permanent place to stay is staying here on April 1, 2010, count that person. Otherwise, he or she may be missed in the census.

1. How many people were living or staying in this house, apartment, or mobile home on April 1, 2010?

Number of people =

2. Were there any additional people staying here April 1, 2010 that you did not include in Question 1? *Mark ✗ all that apply.*

- ☐ Children, such as newborn babies or foster children
- ☐ Relatives, such as adult children, cousins, or in-laws
- ☐ Nonrelatives, such as roommates or live-in baby sitters
- ☐ People staying here temporarily
- ☐ No additional people

3. Is this house, apartment, or mobile home — *Mark ✗ ONE box.*

- ☐ Owned by you or someone in this household with a mortgage or loan? *Include home equity loans.*
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented?
- ☐ Occupied without payment of rent?

4. What is your telephone number? *We may call if we don't understand an answer.*

Area Code + Number

OMB No. 0607-0919-C: Approval Expires 12/31/2011.

Form D-61 (1-15-2009)

5. Please provide information for each person living here. Start with a person living here who owns or rents this house, apartment, or mobile home. If the owner or renter lives somewhere else, start with any adult living here. This will be Person 1.

What is Person 1's name? *Print name below.*

Last Name

First Name MI

6. What is Person 1's sex? *Mark ✗ ONE box.*

☐ Male ☐ Female

7. What is Person 1's age and what is Person 1's date of birth?

Please report babies as age 0 when the child is less than 1 year old.

Print numbers in boxes.

Age on April 1, 2010 | Month | Day | Year of birth

→ **NOTE: Please answer BOTH Question 8 about Hispanic origin and Question 9 about race. For this census, Hispanic origins are not races.**

8. Is Person 1 of Hispanic, Latino, or Spanish origin?

- ☐ No, not of Hispanic, Latino, or Spanish origin
- ☐ Yes, Mexican, Mexican Am., Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, another Hispanic, Latino, or Spanish origin — *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.*

9. What is Person 1's race? *Mark ✗ one or more boxes.*

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.*
- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Other Asian — *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.*
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander — *Print race, for example, Fijian, Tongan, and so on.*
- ☐ Some other race — *Print race.*

10. Does Person 1 sometimes live or stay somewhere else?

☐ No ☐ Yes — *Mark ✗ all that apply.*

- ☐ In college housing
- ☐ In the military
- ☐ At a seasonal or second residence
- ☐ For child custody
- ☐ In jail or prison
- ☐ In a nursing home
- ☐ For another reason

→ **If more people were counted in Question 1, continue with Person 2.**

INFORMATION COPY

Why does the government ask these questions?

This book is a good guide…

7. What is Person 1's age and what is Person 1's date of birth?

COMMUNITY BENEFITS

Education

Counties and school districts are allotted funds based on age data. These funds provide resources and services to improve the education of economically disadvantaged children and children with disabilities.

Locations where new schools are needed, as well as the required grade levels (elementary, middle, or high school), are identified using data about age.

Government

Data presenting the voting-age population are used by states to meet legislative redistricting requirements.

Planners at all levels of government forecast the need for highways, hospitals, health services, and retirement homes by using age data.

Employment

Data about age are used to target veterans for job training programs.

Equal employment opportunities are enforced using data about age.

Social Services

Age data are used to forecast the number of people eligible for Social Security and Medicare benefits.

Under the Older Americans Act, age data are part of the formula used to allocate funds for services to seniors with low incomes.

Think about these questions when you use the data

- How would you answer the questions
- What about your roommates or family members
- Think about how race and Hispanic/Latino ethnicity are categorized
- Think about how people respond to those questions
- Many Hispanics marked “some other race” – why?

Race

- "Race" is a self-identification data item in which respondents choose the race or *races* with which they most closely identify.

Race categories -

a person may choose one or more:

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Some other race
- Two or more races

Hispanic ethnicity– also self-identified

- Questions pertaining to *Hispanic/Latino* – a person's options are *either*:
  - Hispanic or Latino
    - Mexican, Mexican American, Chicano
    - Puerto Rican
    - Cuban
    - Other
  - **Not** Hispanic or Latino

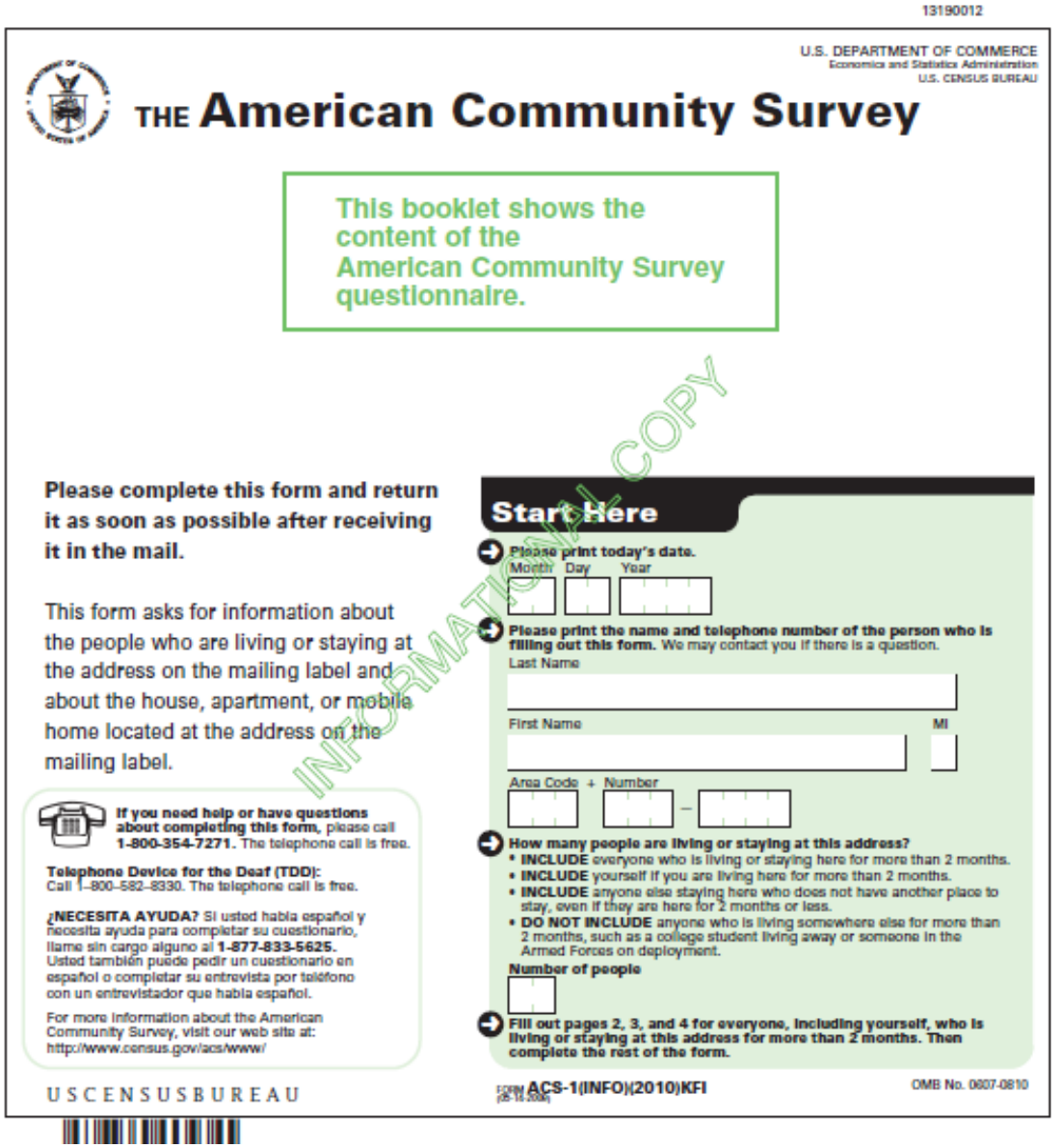
So understand you can't combine numbers across race/Hispanic ethnicity

Look for Hispanic and Non-Hispanic tabulations (requires you to be very observant of the details when getting data!)

American Community Survey

- Continuous monthly survey
- Began in 2005
- **<u>It has replaced</u>** the decennial census *long form*

Look at the American Community Survey Questionnaire



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U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

THE American Community Survey

This booklet shows the content of the American Community Survey questionnaire.

INFORMATIONAL COPY

Please complete this form and return it as soon as possible after receiving it in the mail.

This form asks for information about the people who are living or staying at the address on the mailing label and about the house, apartment, or mobile home located at the address on the mailing label.

If you need help or have questions about completing this form, please call **1-800-354-7271.** The telephone call is free.

Telephone Device for the Deaf (TDD):
Call 1-800-582-8330. The telephone call is free.

¿NECESITA AYUDA? Si usted habla español y necesita ayuda para completar su cuestionario, llame sin cargo alguno al **1-877-833-5625.** Usted también puede pedir un cuestionario en español o completar su entrevista por teléfono con un entrevistador que habla español.

For more information about the American Community Survey, visit our web site at: http://www.census.gov/acs/www/

USCENSUSBUREAU

Start Here

Please print today's date.
Month Day Year

Please print the name and telephone number of the person who is filling out this form. We may contact you if there is a question.
Last Name
First Name MI
Area Code + Number

How many people are living or staying at this address?
- **INCLUDE** everyone who is living or staying here for more than 2 months.
- **INCLUDE** yourself if you are living here for more than 2 months.
- **INCLUDE** anyone else staying here who does not have another place to stay, even if they are here for 2 months or less.
- **DO NOT INCLUDE** anyone who is living somewhere else for more than 2 months, such as a college student living away or someone in the Armed Forces on deployment.

Number of people

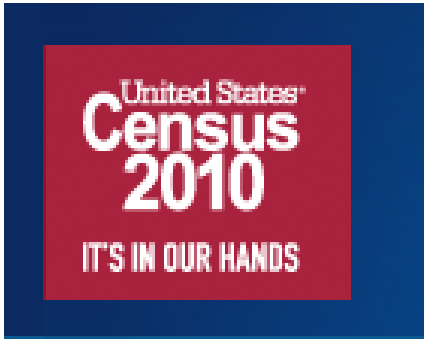
Fill out pages 2, 3, and 4 for everyone, including yourself, who is living or staying at this address for more than 2 months. Then complete the rest of the form.

FORM **ACS-1(INFO)(2010)KFI**
OMB No. 0607-0810

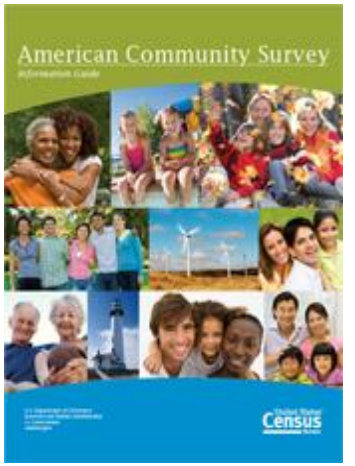
Again, think about how people would respond to these questions

- Accuracy of answers?
- Would you know when your house was built?
- Do you know how much you spent for heating costs?
- Concerns about privacy?

Census \ Survey



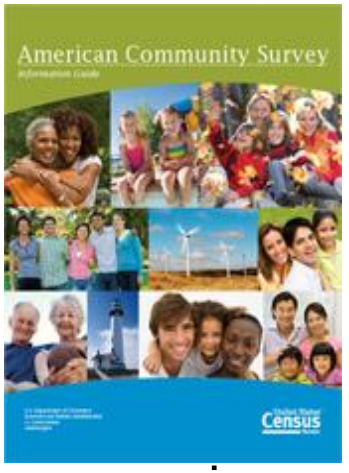
- A one-point-in-time snapshot of population and housing
- Available for small areas
- Not as current as ACS
- Limited topics (100% data)



- Most current data available w/ annual updates
- Limited data for small areas
- 1 yr., 3 yr., & 5 yr. estimates
- Estimates may have large margins of error

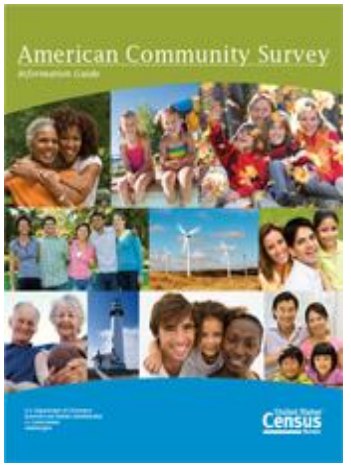
When to Use…

- Short-form
  - –Population
    - Sex, Age, Hispanic Origin, Race, Relationship to head of Household
  - –Housing Data
    - Tenure (Owned or Rented)
- Constitutionally required for redistricting



- Long-form
  - –Comprehensive Socioeconomic and detailed housing data.
  - –Selected topics: Ancestry, Disability, Citizenship, Educational Attainment, Income, Class of worker, Tenure in house, Plumbing Facilities
  - –High sampling errors
- In danger of losing funding

ACS Subject Topics



Demographic	Economic	Housing
Age Sex Race	Income	Year Built
Hispanic Origin	Food Stamp Benefit	Units in Structure
Rel. to Householder	Labor Force Status	Year Moved into Unit
	Industry	Room Bedrooms
Social	Occupation	Kitchen Facilities
Marital Status/History	Class of Worker	Plumbing Facilities
Fertility Ancestry Disability	Place of Work	House Heating Fuel
Grandparents as Caregivers	Journey to Work	Telephone Serv. Available
Place of Birth	Work Status Last Year	Farm Residence
Citizenship	Vehicles Available	Tenure (Owner/Renter)
Year of Entry	Health Ins. Coverage	Housing Value
Language Spoken at Home		Rent
Educational Attainment		Monthly Owner Costs
School Enrollment		
Residence 1 Year Ago		
Veteran Status		
Period of Military Service		
VA Service-Connected Disability		

With a decennial census you can only change questions every ten years. With ACS they can modify/add/delete questions more easily. Leads to consistency issues over time.

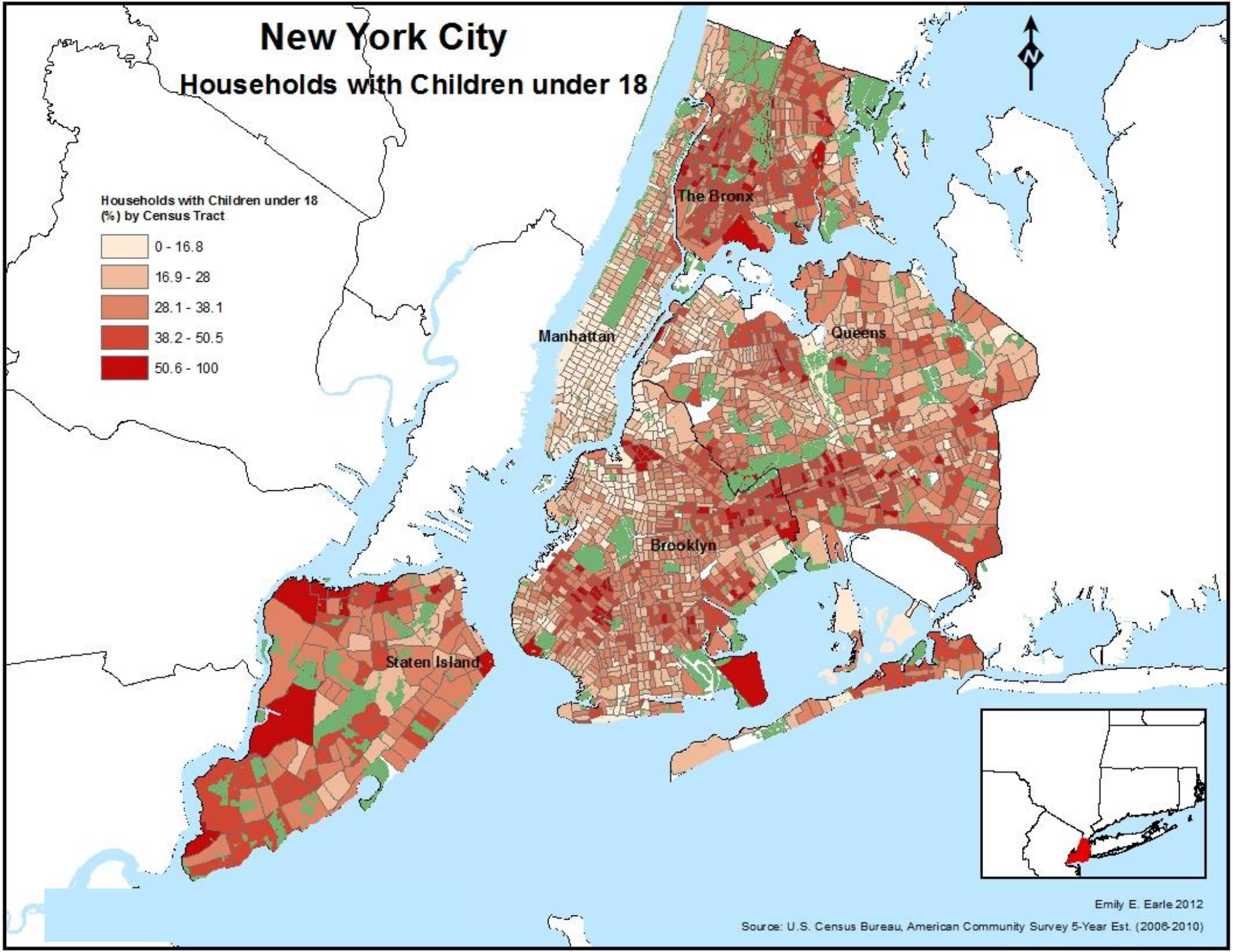
ACS Products

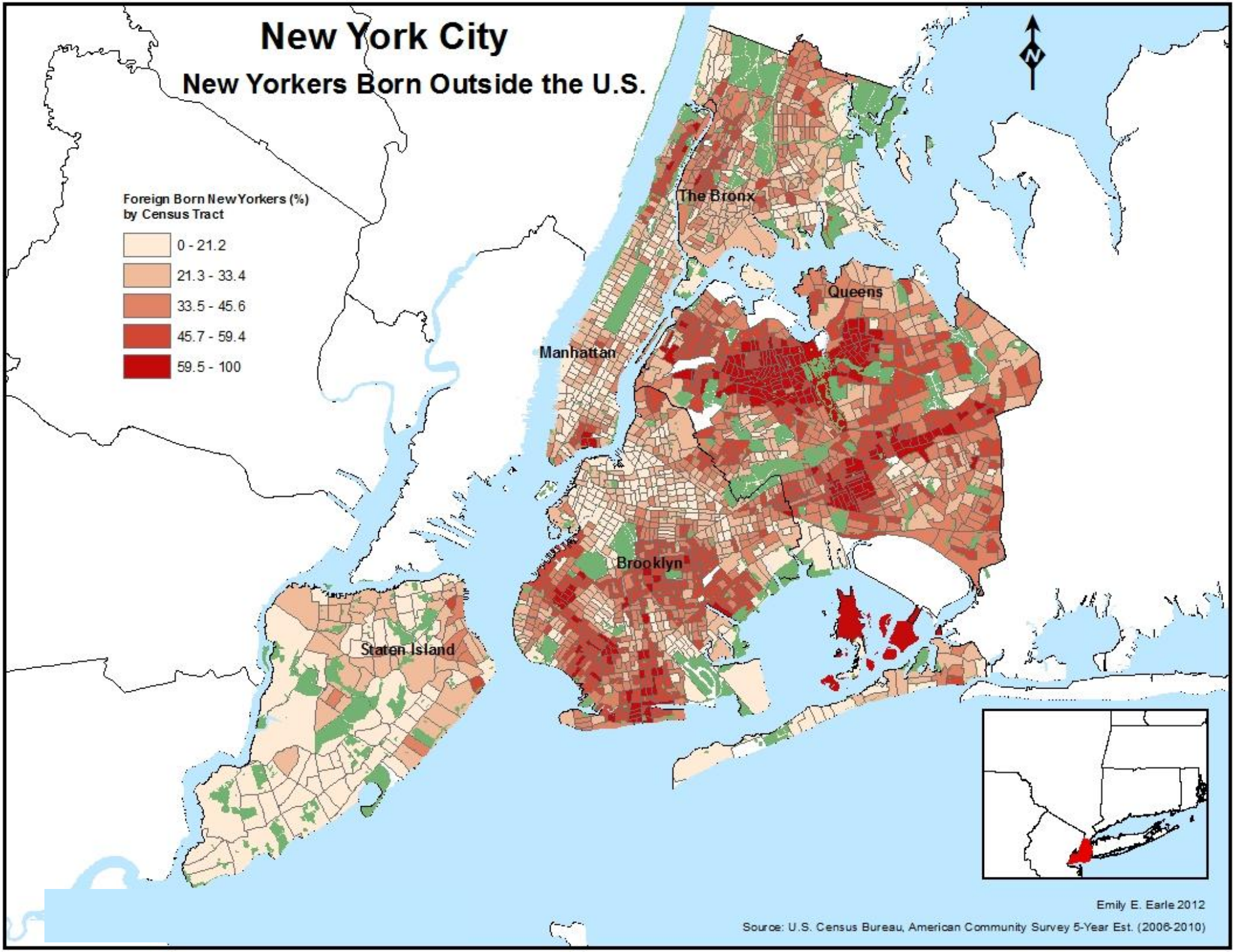
- Data Profiles
- Comparison profiles (across years)
- Selected population profile tables
- (race, ethnic, ancestry, tribal groups)
- Subject tables
- Ranking tables
- Detailed tables
- Geographic comparison tables
- Thematic maps
- Public use microdata sample file

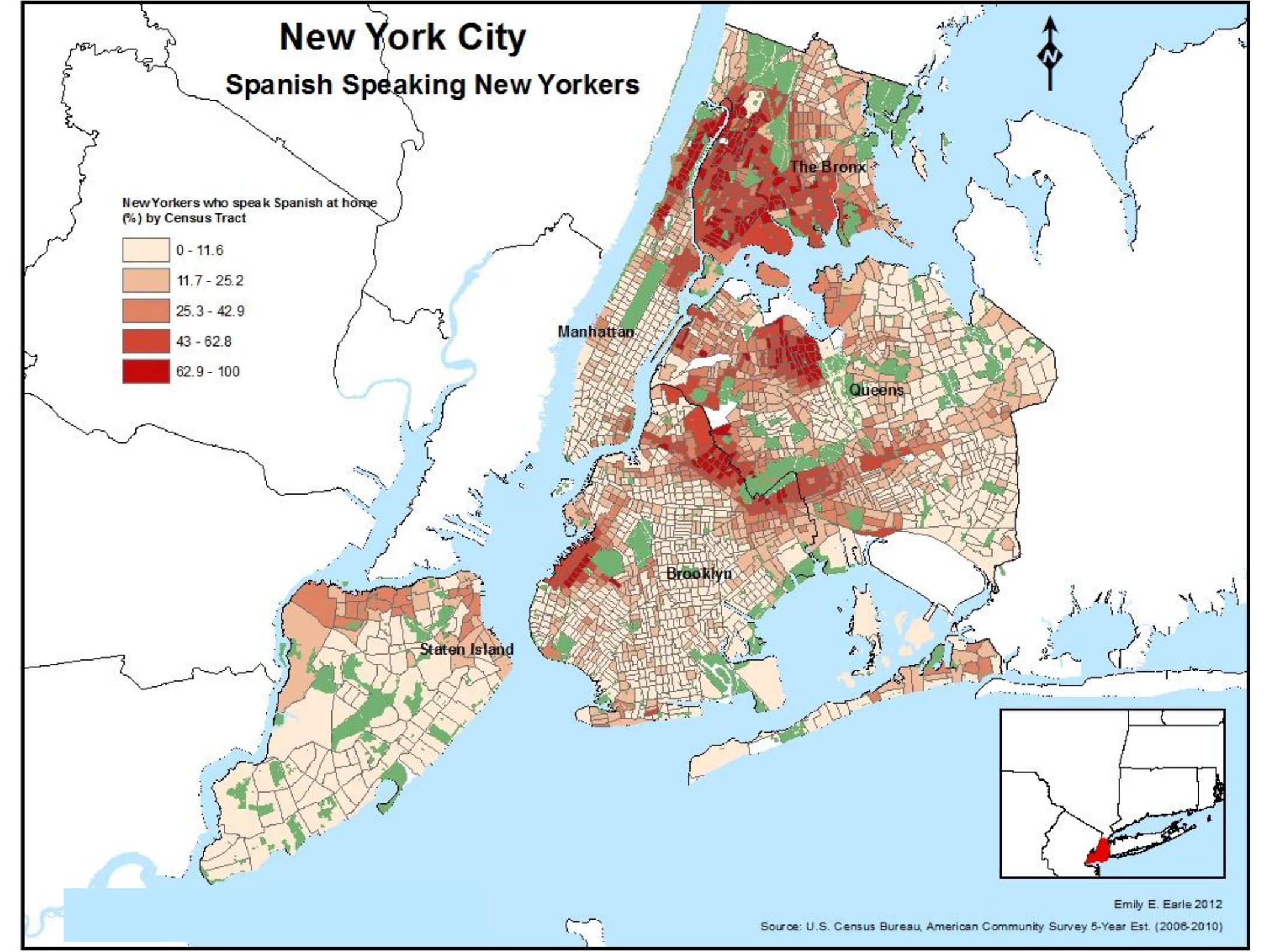
(40% sample of ACS file, create crosstabs)

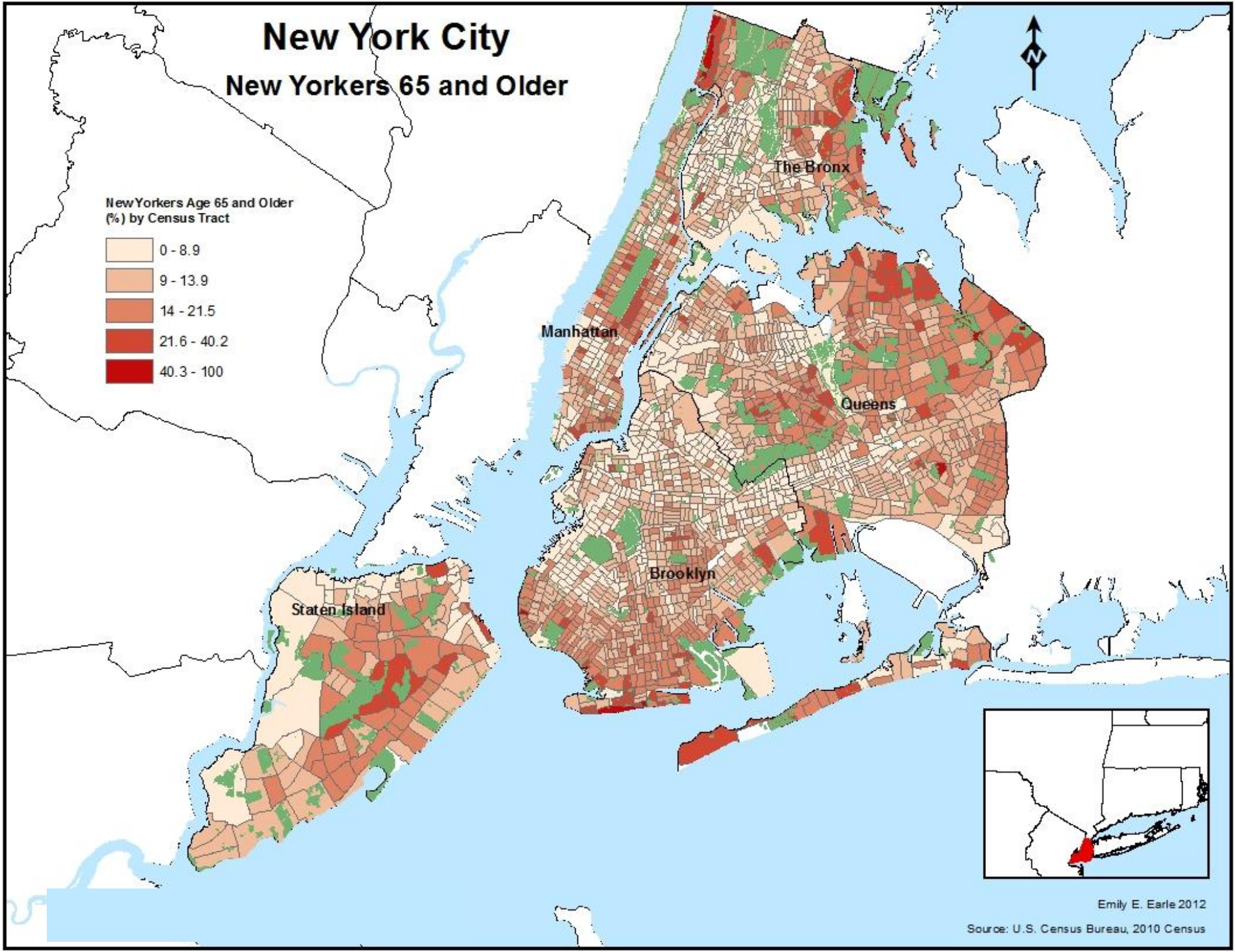
Look at the following maps of New York City

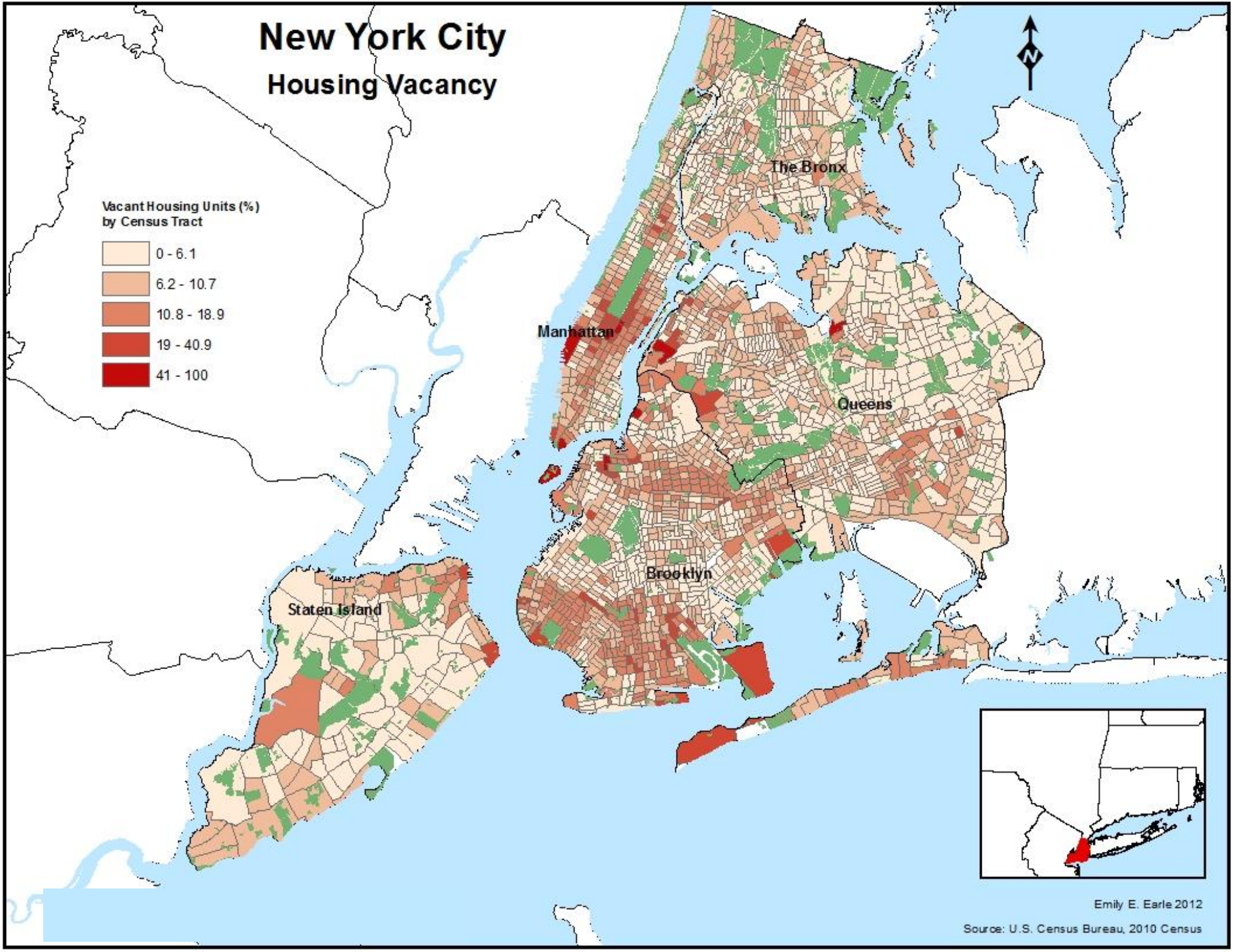
Would the data come from the Census or the American Community Survey (ACS)?

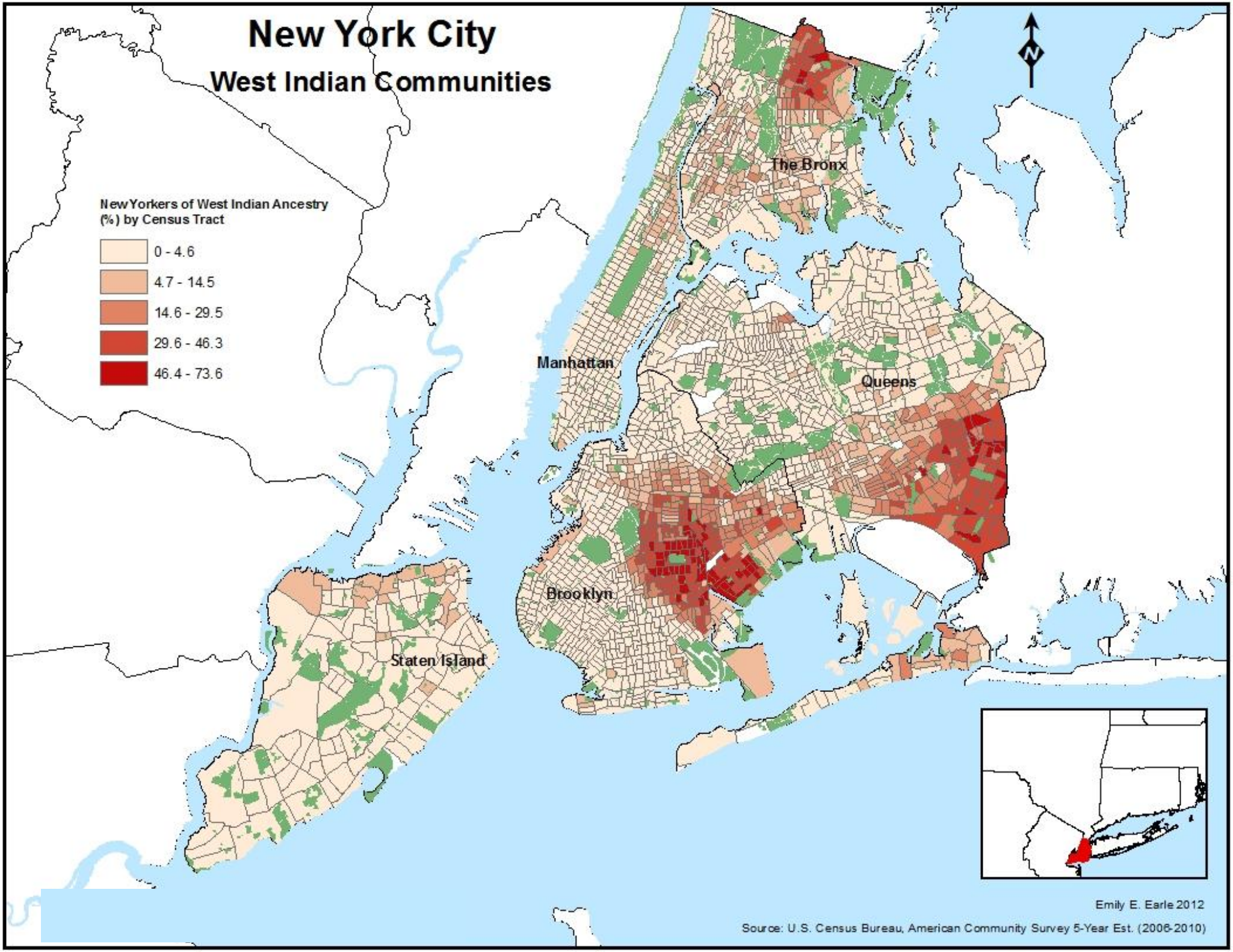

New York City
Households with Children under 18
Households with Children under 18 (%) by Census Tract
0 - 16.8
16.9 - 28
28.1 - 38.1
38.2 - 50.5
50.6 - 100
N
The Bronx
Manhattan
Queens
Brooklyn
Staten Island
Emily E. Earle 2012
Source: U.S. Census Bureau, American Community Survey 5-Year Est. (2006-2010)


New York City
New Yorkers Born Outside the U.S.
Foreign Born NewYorkers (%)
by Census Tract
0 - 21.2
21.3 - 33.4
33.5 - 45.6
45.7 - 59.4
59.5 - 100
The Bronx
Queens
Manhattan
Brooklyn
Staten Island
N
Emily E. Earle 2012
Source: U.S. Census Bureau, American Community Survey 5-Year Est. (2006-2010)


New York City
Spanish Speaking New Yorkers
New Yorkers who speak Spanish at home (%) by Census Tract
0 - 11.6
11.7 - 25.2
25.3 - 42.9
43 - 62.8
62.9 - 100
N
The Bronx
Manhattan
Queens
Brooklyn
Staten Island
Emily E. Earle 2012
Source: U.S. Census Bureau, American Community Survey 5-Year Est. (2006-2010)


New York City
New Yorkers 65 and Older
New Yorkers Age 65 and Older (%) by Census Tract
0 - 8.9
9 - 13.9
14 - 21.5
21.6 - 40.2
40.3 - 100
The Bronx
Manhattan
Queens
Brooklyn
Staten Island
N
Emily E. Earle 2012
Source: U.S. Census Bureau, 2010 Census

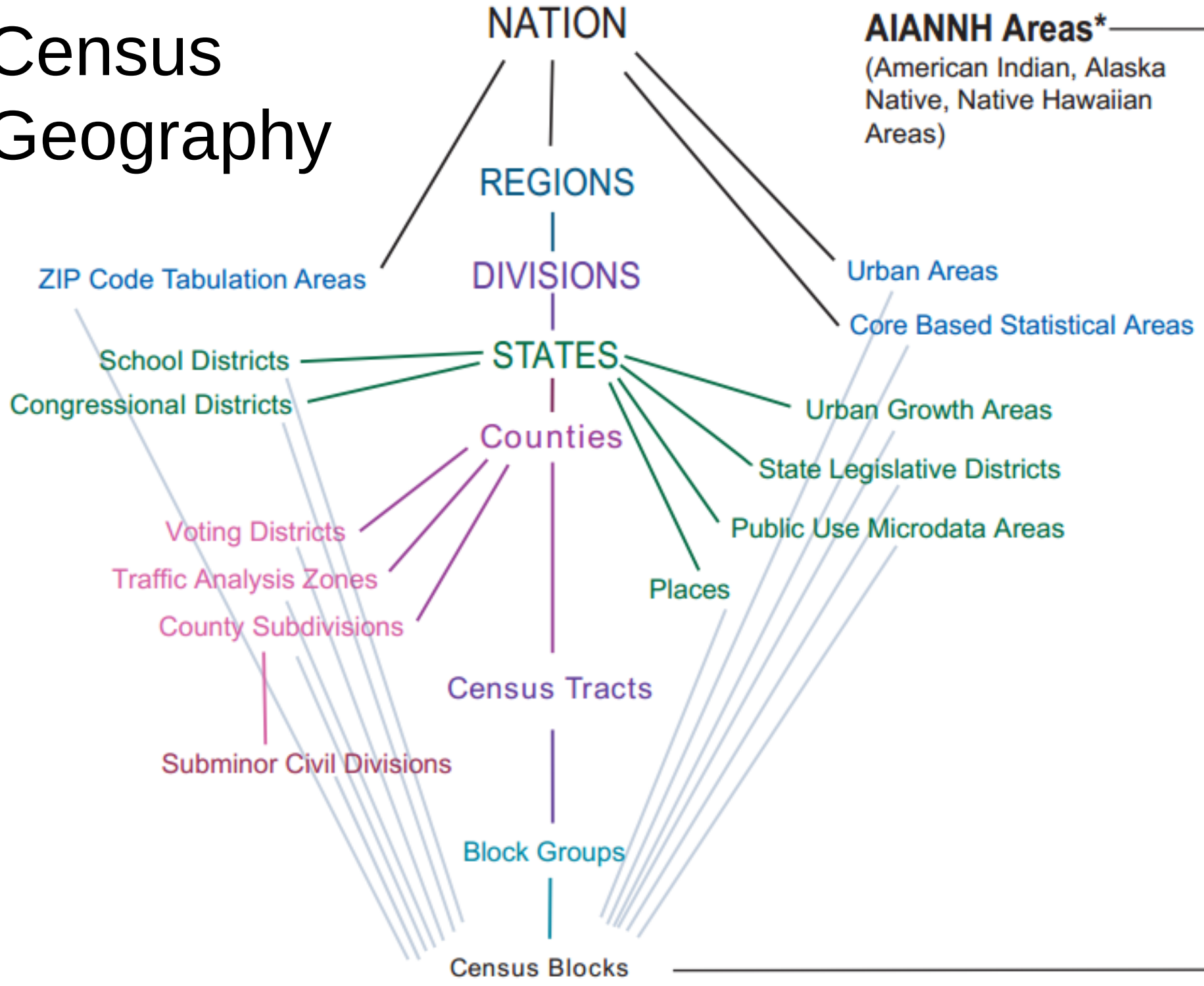

New York City
Housing Vacancy
Vacant Housing Units (%)
by Census Tract
0 - 6.1
6.2 - 10.7
10.8 - 18.9
19 - 40.9
41 - 100
N
The Bronx
Manhattan
Queens
Brooklyn
Staten Island
Emily E. Earle 2012
Source: U.S. Census Bureau, 2010 Census


New York City
West Indian Communities
New Yorkers of West Indian Ancestry (%) by Census Tract
0 - 4.6
4.7 - 14.5
14.6 - 29.5
29.6 - 46.3
46.4 - 73.6
The Bronx
Manhattan
Queens
Brooklyn
Staten Island
N
Emily E. Earle 2012
Source: U.S. Census Bureau, American Community Survey 5-Year Est. (2006-2010)

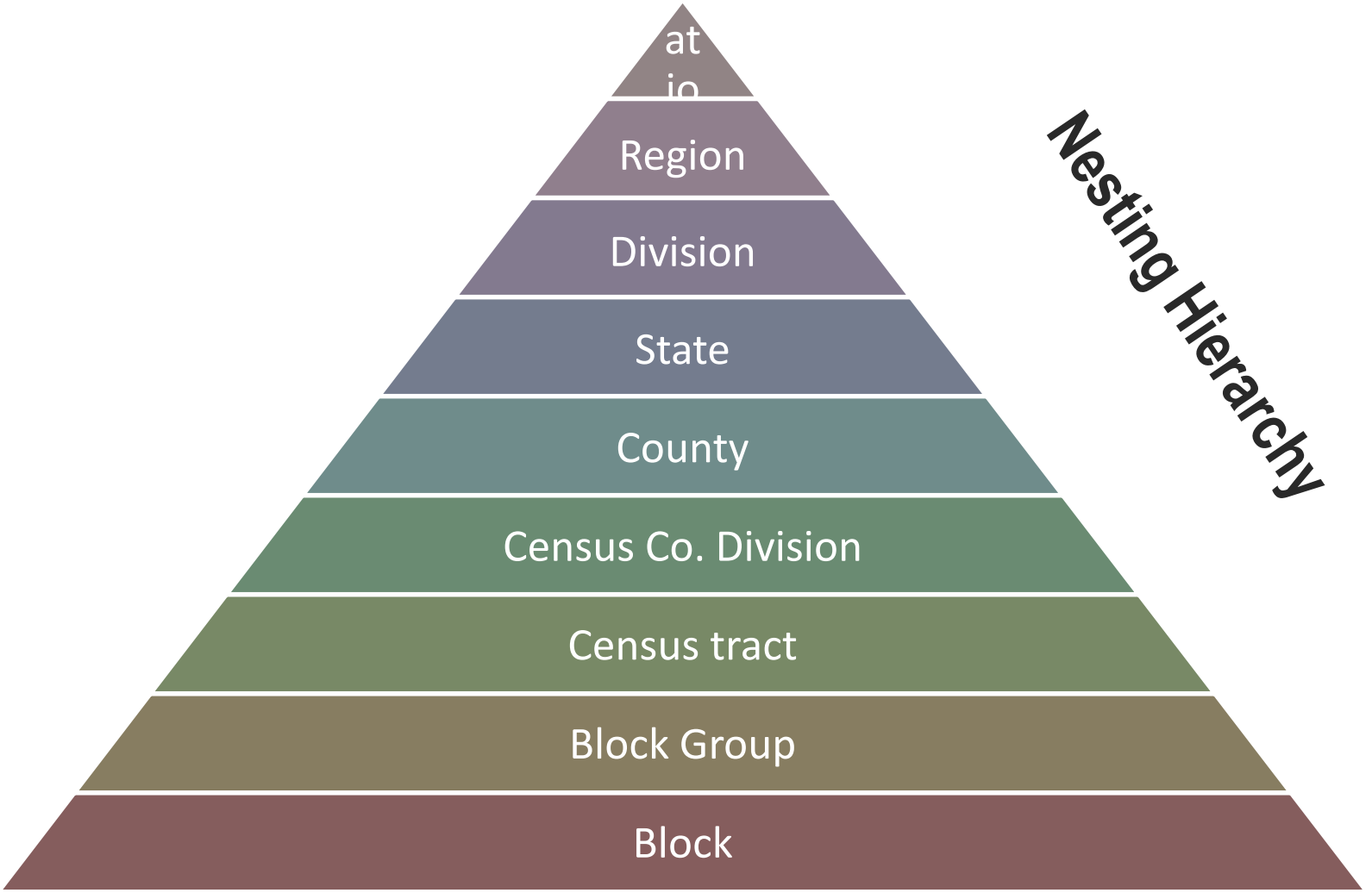
Census Tabulations

- The Census Bureau makes the data accessible by releasing **tabulations**
  - tabulations are aggregations of the data in ways that are useful for most users
- The tabulations are for various levels of **geography**, e.g.,
  - Census block, blockgroup, tract
  - City, County
  - Metropolitan areas
  - States

Census Geography

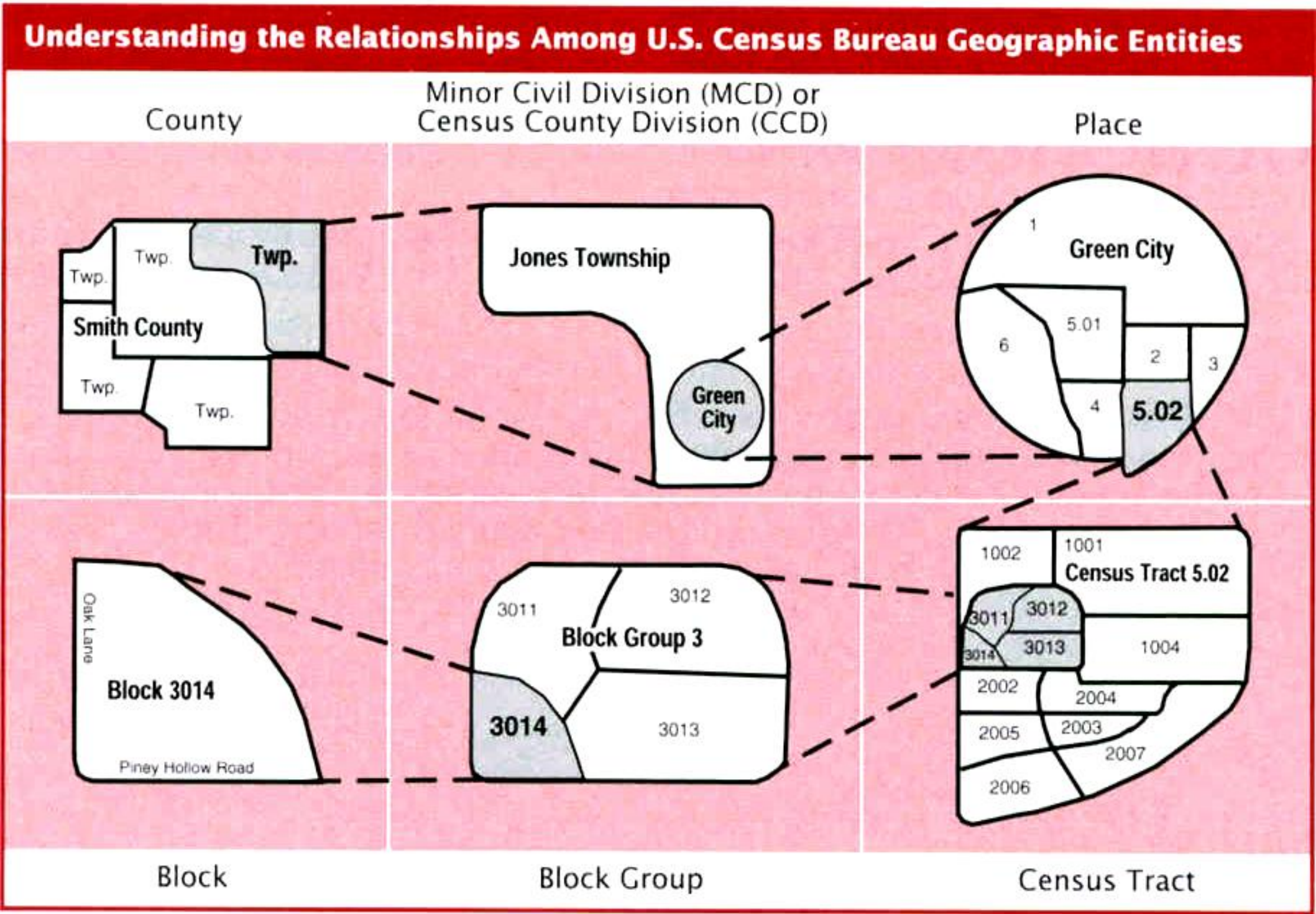


Nesting Geography Hierarchy



No ACS data available for blocks and block group data require programming or alternate access tools

Census Small-Area Geography



Neighborhood scale census geography levels:

- Blocks
  - Average about 100 people
  - In cities, these are often city blocks; farther out they are larger
- Block groups
  - 300-1500 people
- Tracts
  - 1000-8000 people

Blocks

- Smallest units of data tabulation
- Cover the entire nation
- Do not cross census tracts or counties
- Generally bounded by visible features and legal boundaries
- Block numbers completely different from 1990
- Size: average about 100 people

Block Groups

- Groups of blocks sharing the same first digit
- Smallest areas for which sample data available
- Size: optimally 1,500 people, range between 300 to 3,000

Census Tracts

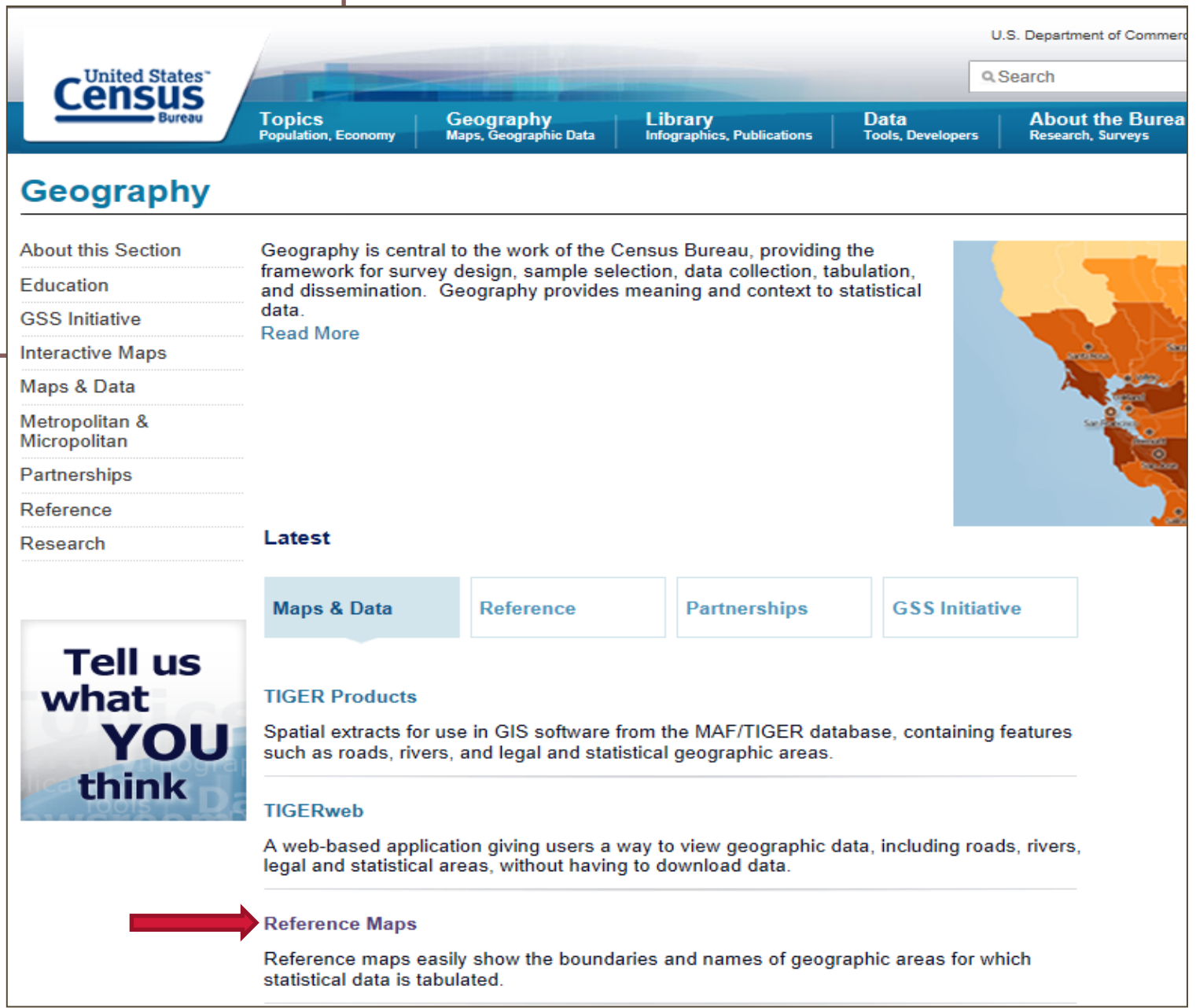
- For the first time for Census 2000: Cover the nation
- Relatively homogenous population characteristics
- 65,000 Census tracts across U.S.
- Size: optimally 4,000 people, range between 1,000 and 8,000

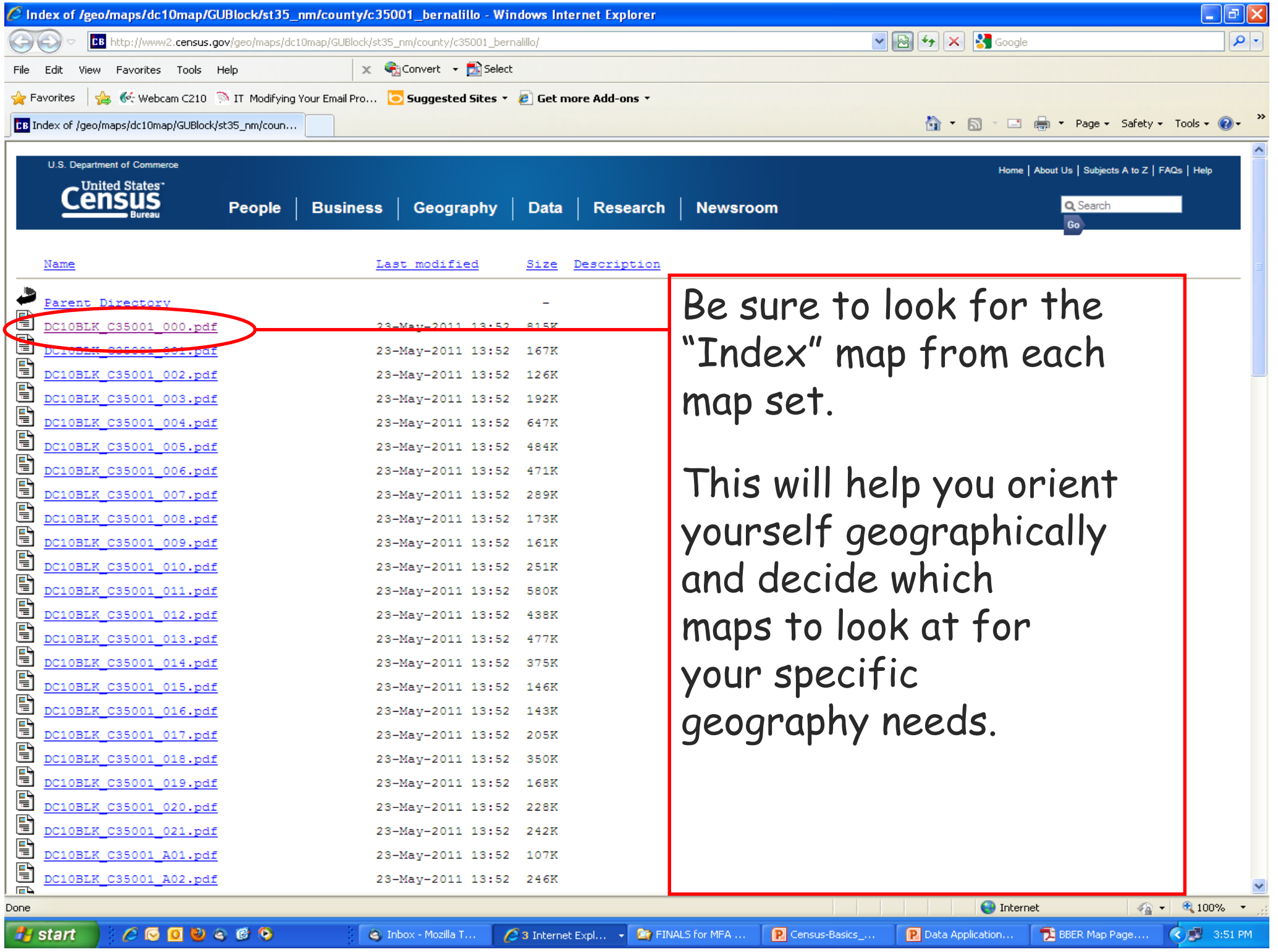
Census Geography on the website

http://www.census.gov/geography.html

Links to maps

- TIGER Files for GIS
- Area Definitions
- Boundary Changes
- And more…




Index of /geo/maps/dc10map/GUBlock/st35_nm/county/c35001_bernalillo - Windows Internet Explorer
http://www2.census.gov/geo/maps/dc10map/GUBlock/st35_nm/county/c35001_bernalillo/
File Edit View Favorites Tools Help
Convert Select
Favorites Webcam C210 IT Modifying Your Email Pro... Suggested Sites Get more Add-ons
Index of /geo/maps/dc10map/GUBlock/st35_nm/coun...
Page Safety Tools
U.S. Department of Commerce
United States Census Bureau
People Business Geography Data Research Newsroom
Home About Us Subjects A to Z FAQs Help
Search
Go
Name Last modified Size Description
Parent Directory -
DC10BLK_C35001_000.pdf 23-May-2011 13:52 815K
DC10BLK_C35001_001.pdf 23-May-2011 13:52 167K
DC10BLK_C35001_002.pdf 23-May-2011 13:52 126K
DC10BLK_C35001_003.pdf 23-May-2011 13:52 192K
DC10BLK_C35001_004.pdf 23-May-2011 13:52 647K
DC10BLK_C35001_005.pdf 23-May-2011 13:52 484K
DC10BLK_C35001_006.pdf 23-May-2011 13:52 471K
DC10BLK_C35001_007.pdf 23-May-2011 13:52 289K
DC10BLK_C35001_008.pdf 23-May-2011 13:52 173K
DC10BLK_C35001_009.pdf 23-May-2011 13:52 161K
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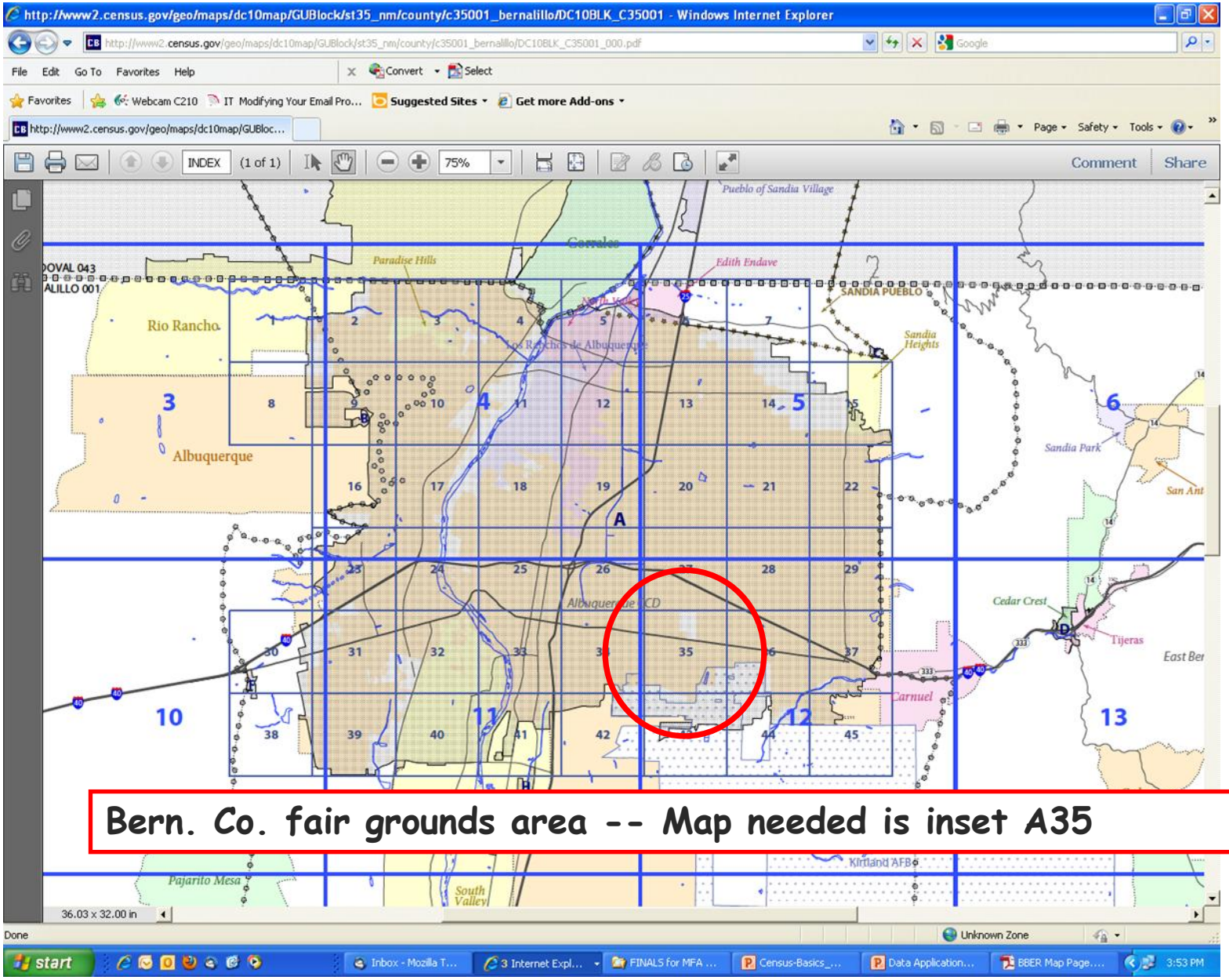
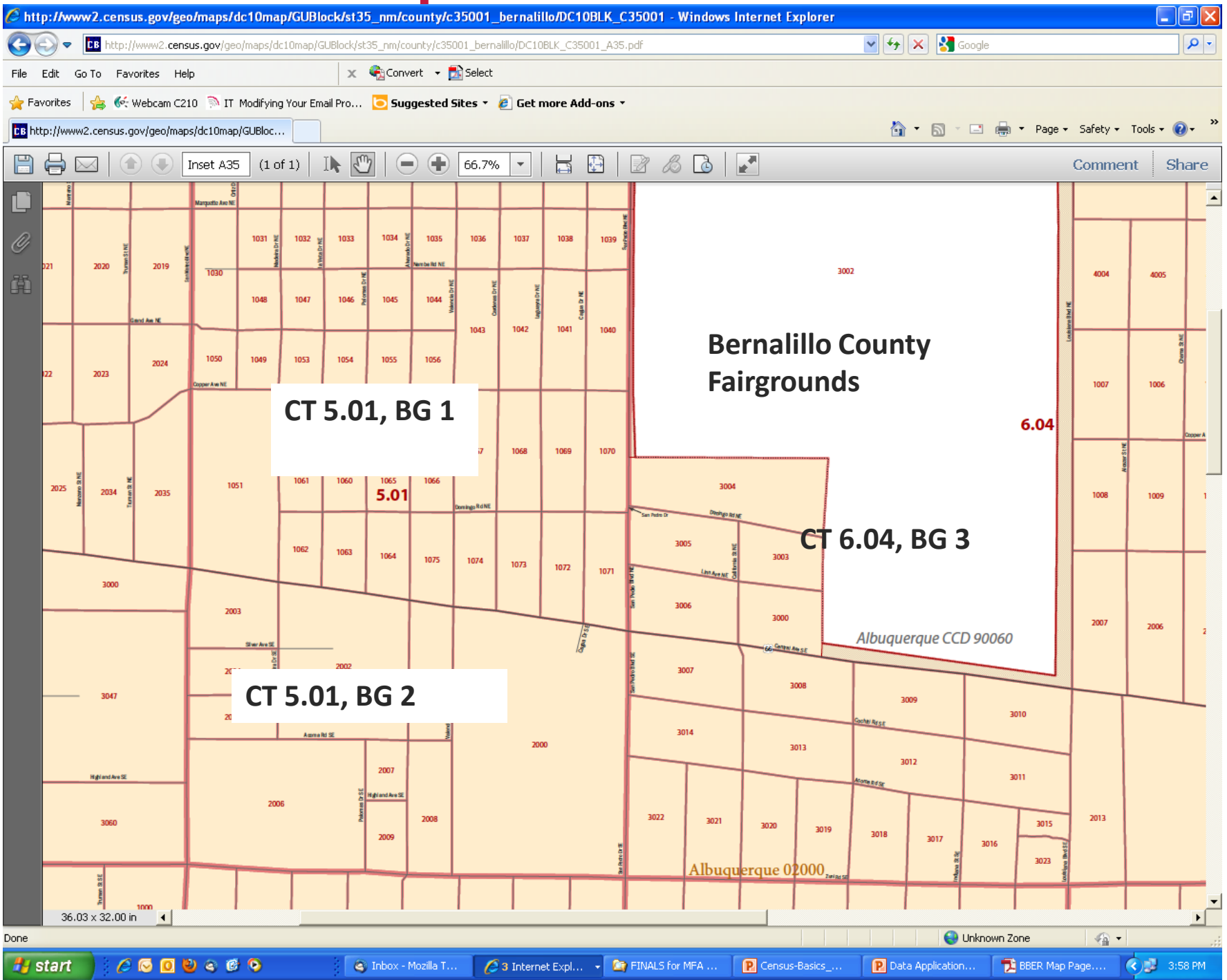
DC10BLK_C35001_020.pdf 23-May-2011 13:52 228K
DC10BLK_C35001_021.pdf 23-May-2011 13:52 242K
DC10BLK_C35001_A01.pdf 23-May-2011 13:52 107K
DC10BLK_C35001_A02.pdf 23-May-2011 13:52 246K
Be sure to look for the "Index" map from each map set.
This will help you orient yourself geographically and decide which maps to look at for your specific geography needs.
Done
Internet
100%
start
Inbox - Mozilla T...
3 Internet Expl...
FINALS for MFA ...
Census-Basics_...
Data Application...
BBER Map Page....
3:51 PM

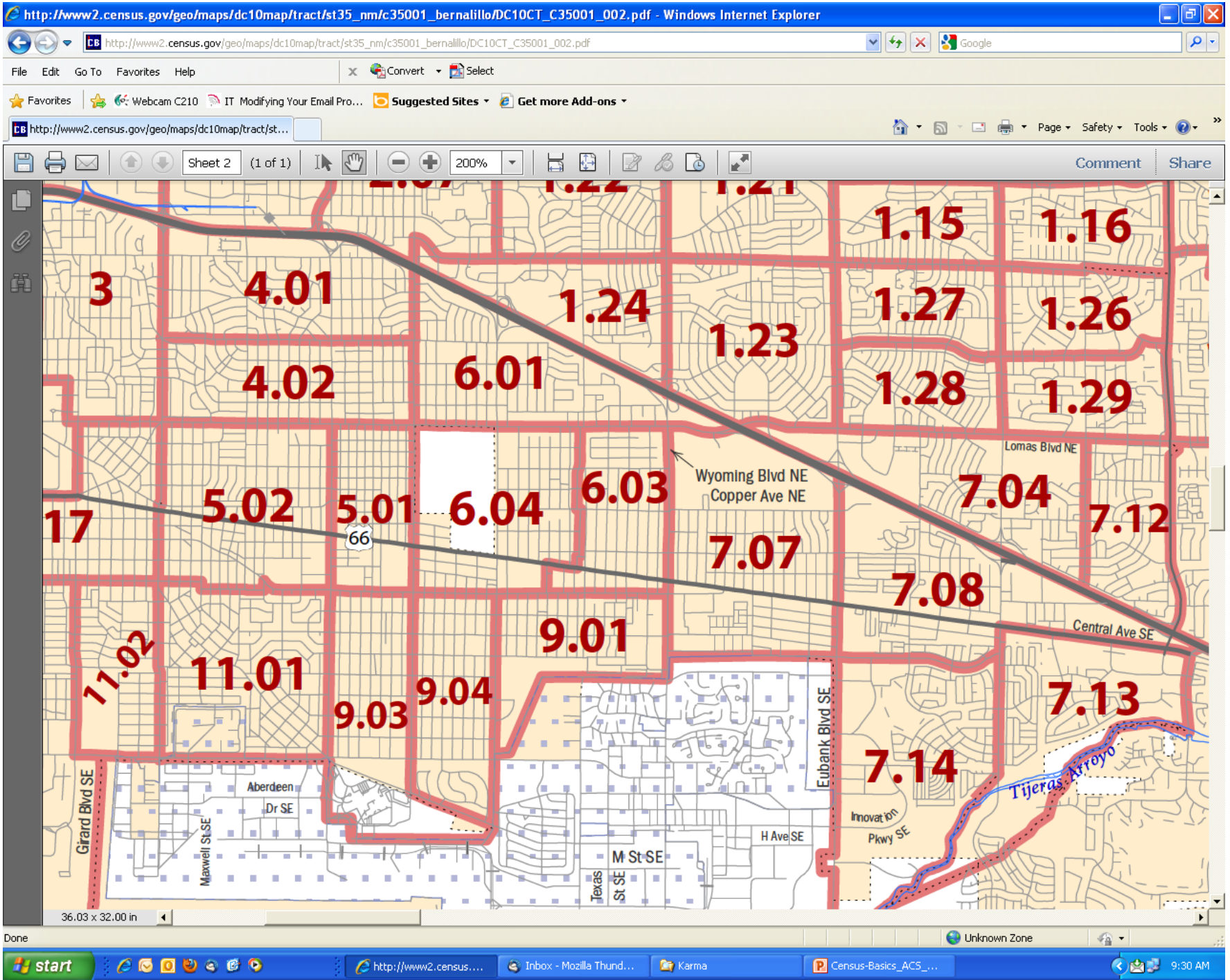
Census and ACS Maps



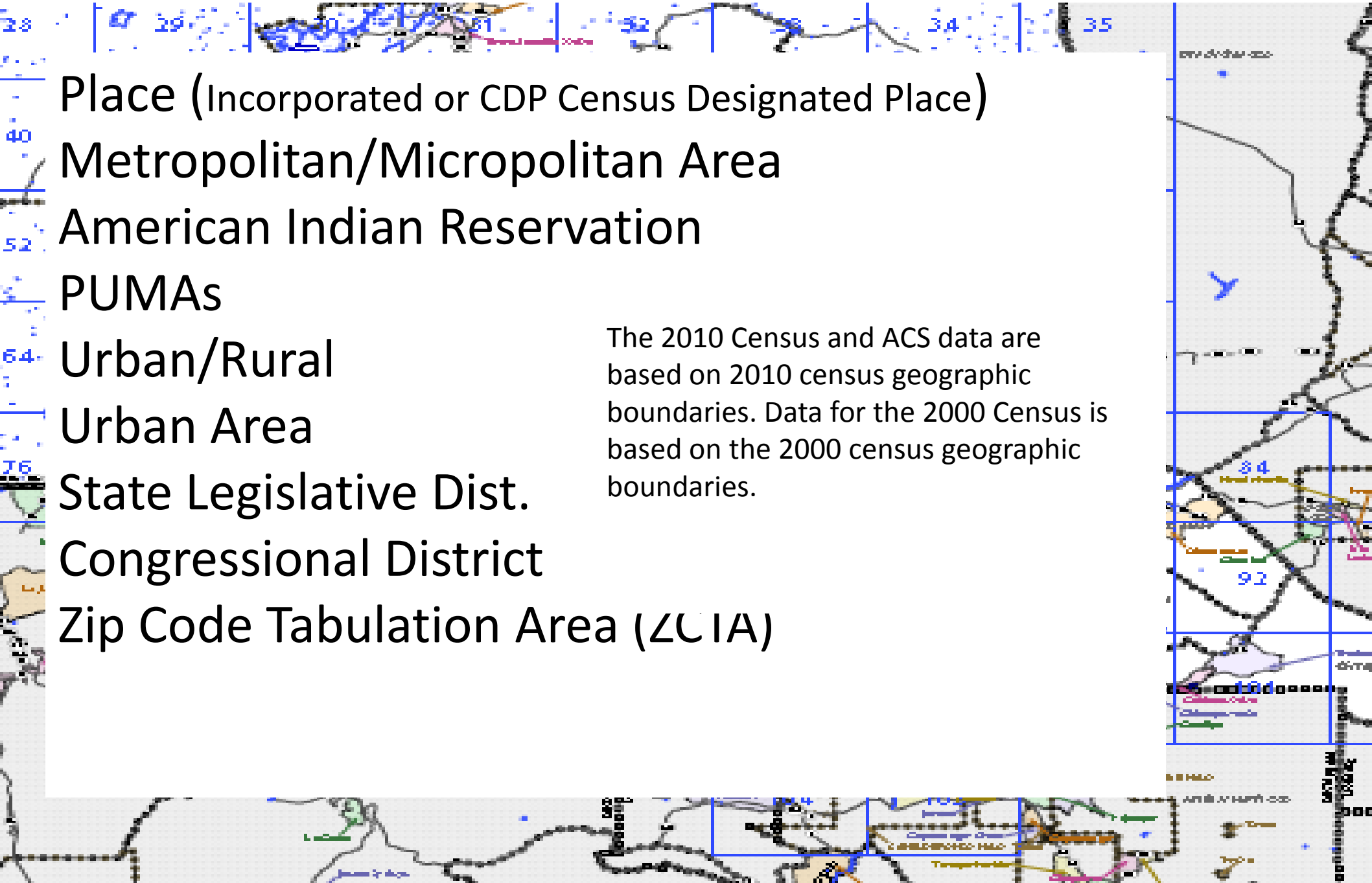
2010 Census map with block level detail



2010 Census map with Census tract level detail



Levels of Geography that are Non-nesting



Place (Incorporated or CDP Census Designated Place)

Metropolitan/Micropolitan Area

American Indian Reservation

PUMAs

Urban/Rural

Urban Area

State Legislative Dist.

Congressional District

Zip Code Tabulation Area (ZCTA)

The 2010 Census and ACS data are based on 2010 census geographic boundaries. Data for the 2000 Census is based on the 2000 census geographic boundaries.

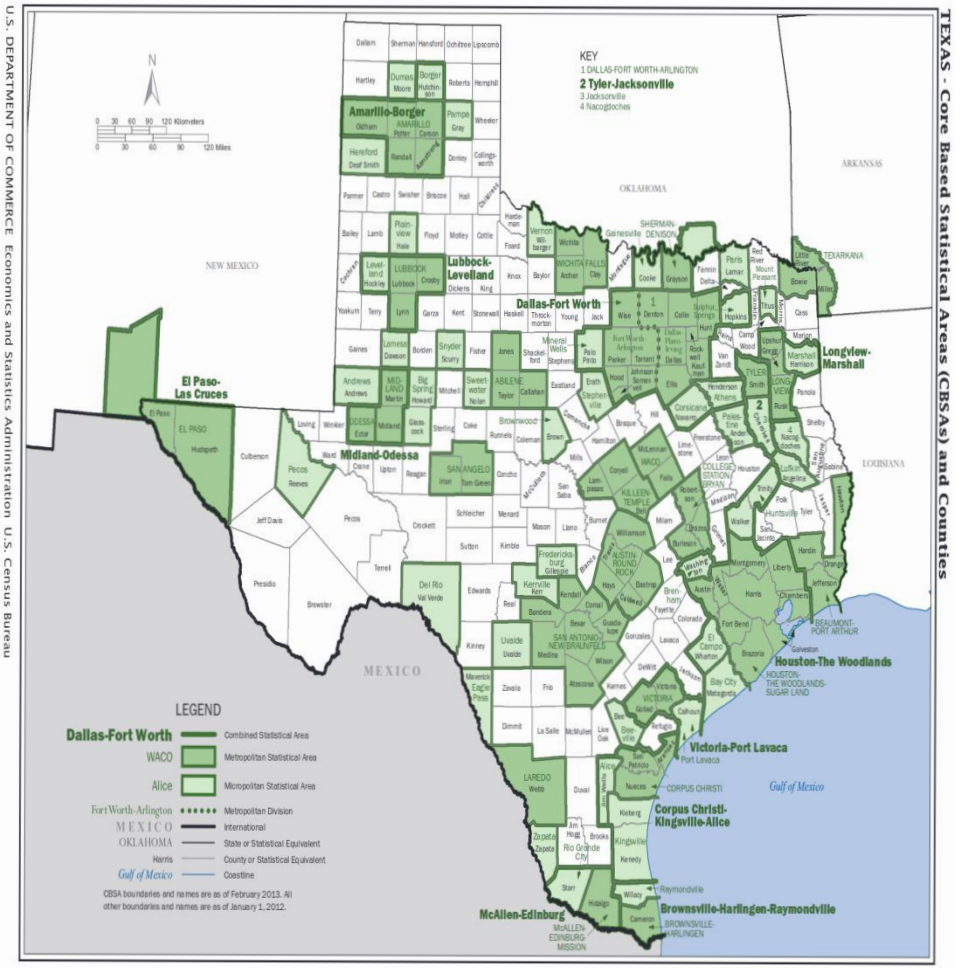
Place Boundaries updated Regularly

Boundaries of incorporated places and other legal jurisdictions are updated regularly by local governments through the Census Bureau's Boundary and Annexation Survey (BAS).

Boundaries of CDPs, census tracts, block groups, blocks and other areas are updated before each census via Census Bureau/local planning programs such as the Participant Statistical Area Program (PSAP).

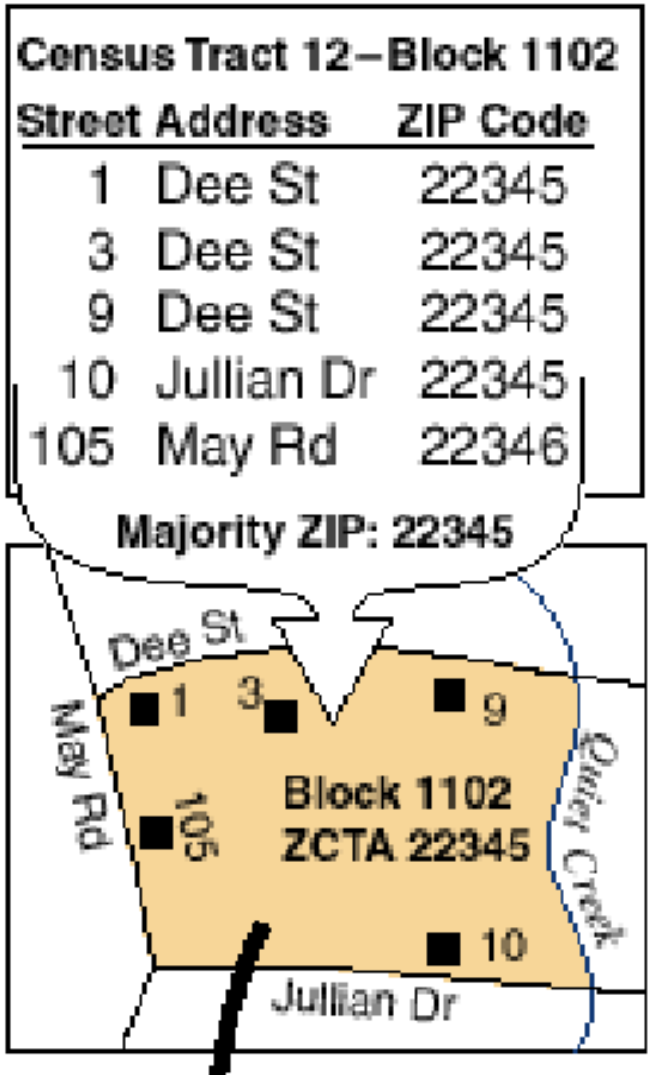
Metropolitan Statistical Areas (MSA) & Micropolitan Statistical Areas

- Consist of a single county or multiple, contiguous cos.
- Contain large central core city (50K+ population)
- High economic integration between counties within an MSA
- Micropolitan Statistical Area similar but with central core city of 10-50K population
- Defined by Office of Mgt. & Budget (OMB)
  - determined for 2010 Census in June 2003
  - updated in Feb 2013.
    - OMB Bulletin No. 13-01
    - The file has 21 Metro & Micro areas for NM.
    - Note: El Paso-Las Cruces, TX-NM Combined Statistical Area



For more information about MSAs go to ww.census.gov/population/metro

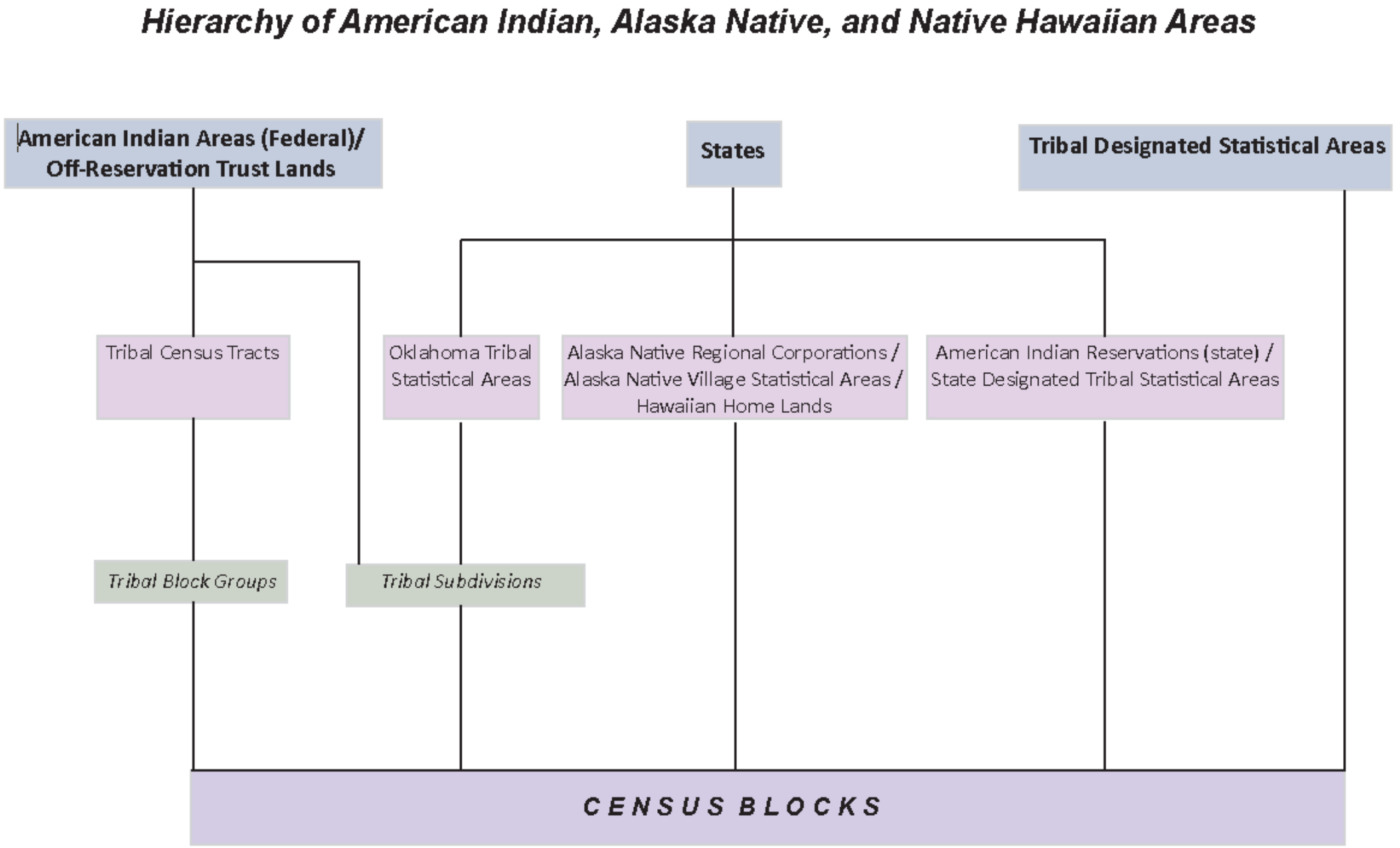
Zip Code Tabulation Area



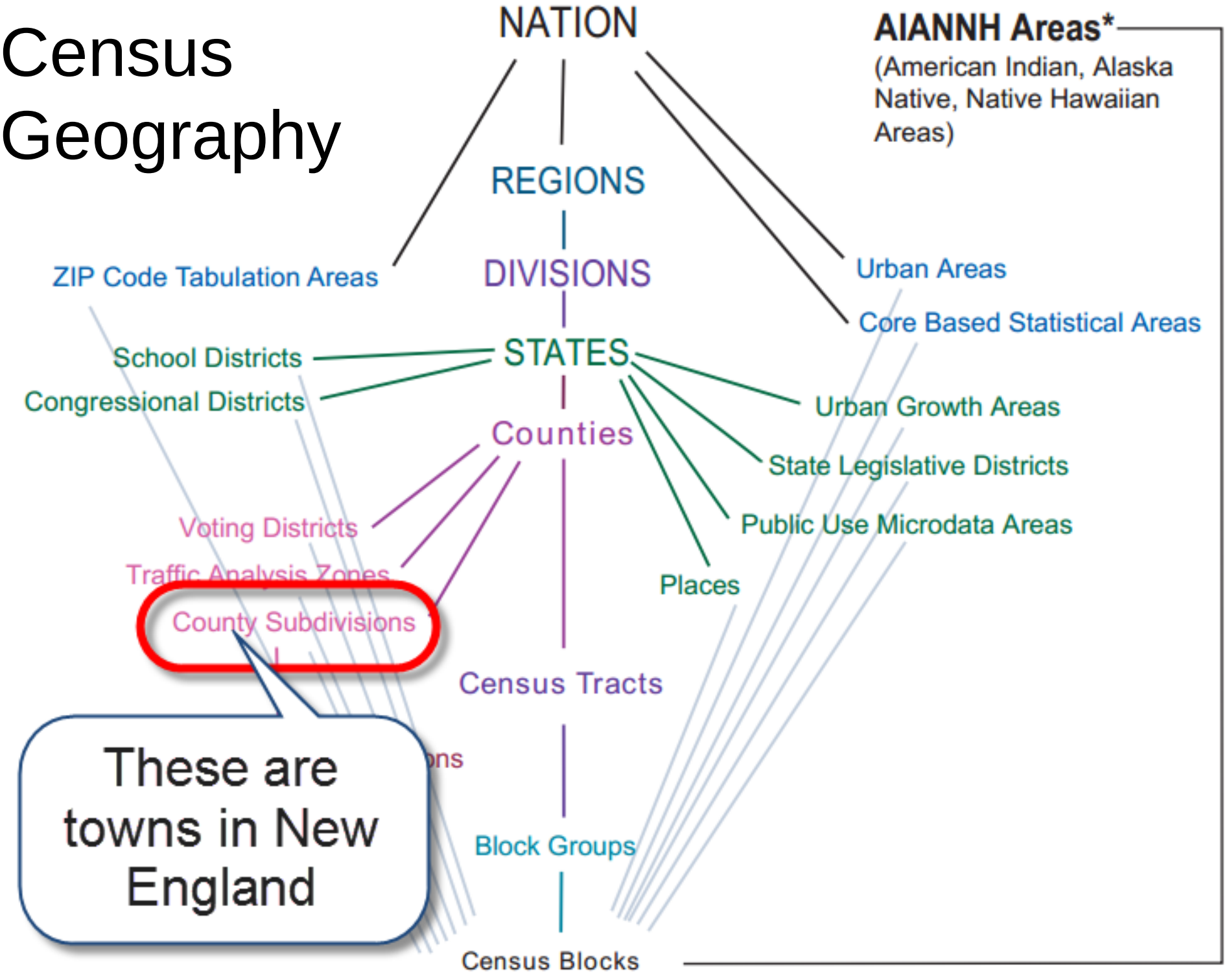
ZIP Code Tabulation Areas or ZCTAs – have a close approximation to actual postal ZIP Code coverage, but are defined by census boundaries. (Can't split a block down the middle.)

Geographies:

American Indian, Alaska Native, and Native Hawaiian Areas



Census Geography



Significant data for policy professionals from the 100% Decennial Census (SF1)

- Basic *Population* Characteristics
  - Numbers of people
  - Age (grouped into cohorts, median age)
  - Families and households (more on this later)
  - Race and Hispanic ethnicity (complicated!)

Significant data for policy professionals from the 100% Census Form (SF1)

- Basic *Housing* Characteristics
  - Number of housing units
  - Tenure
    - Occupied/vacant
    - Owner-occupied / rented
  - Group quarters

American Community Survey: What's In It?

(Note: the Census 2000 Long Form had similar questions, data was referred to as SF3)

- Data on income, poverty, education, occupation, commuting, ancestry, etc.
- Tabulated down to the *census tract* and *block group* level but with large errors
- Not at block level due to privacy constraints
- Released for 5 year averages

- *Population*
- *- Marital Status*
- *-Place of birth, citizenship, entry year*
- *-School Enrollment/Ed. Attainment*
- *-Ancestry*
- *-Migration*
- *-Language spoken*
- *-Veteran status*
- *-Disability*
- *-Grandparents as caregivers*
- *-Labor force status*
- *-Place of work, journey to work*
- *-Occupation, industry, class of worker*
- *-Work status in 1999*
- *-Income in 1999*
- *-Poverty status*
-

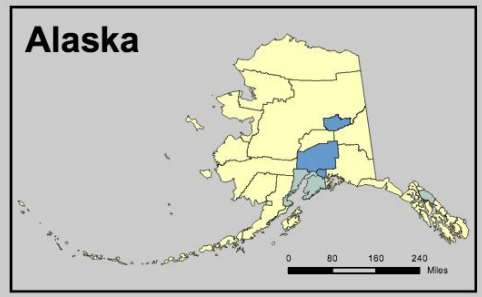
- *Housing*
- *-Value of home or monthly rent paid -Units in structure -Year structure built -Number of rooms and number of bedrooms -Year moved into residence -Plumbing and kitchen facilities -Telephone service -Vehicles available -Heating fuel -Farm residence -Utilities, mortgage, taxes, Insurance and fuel costs*

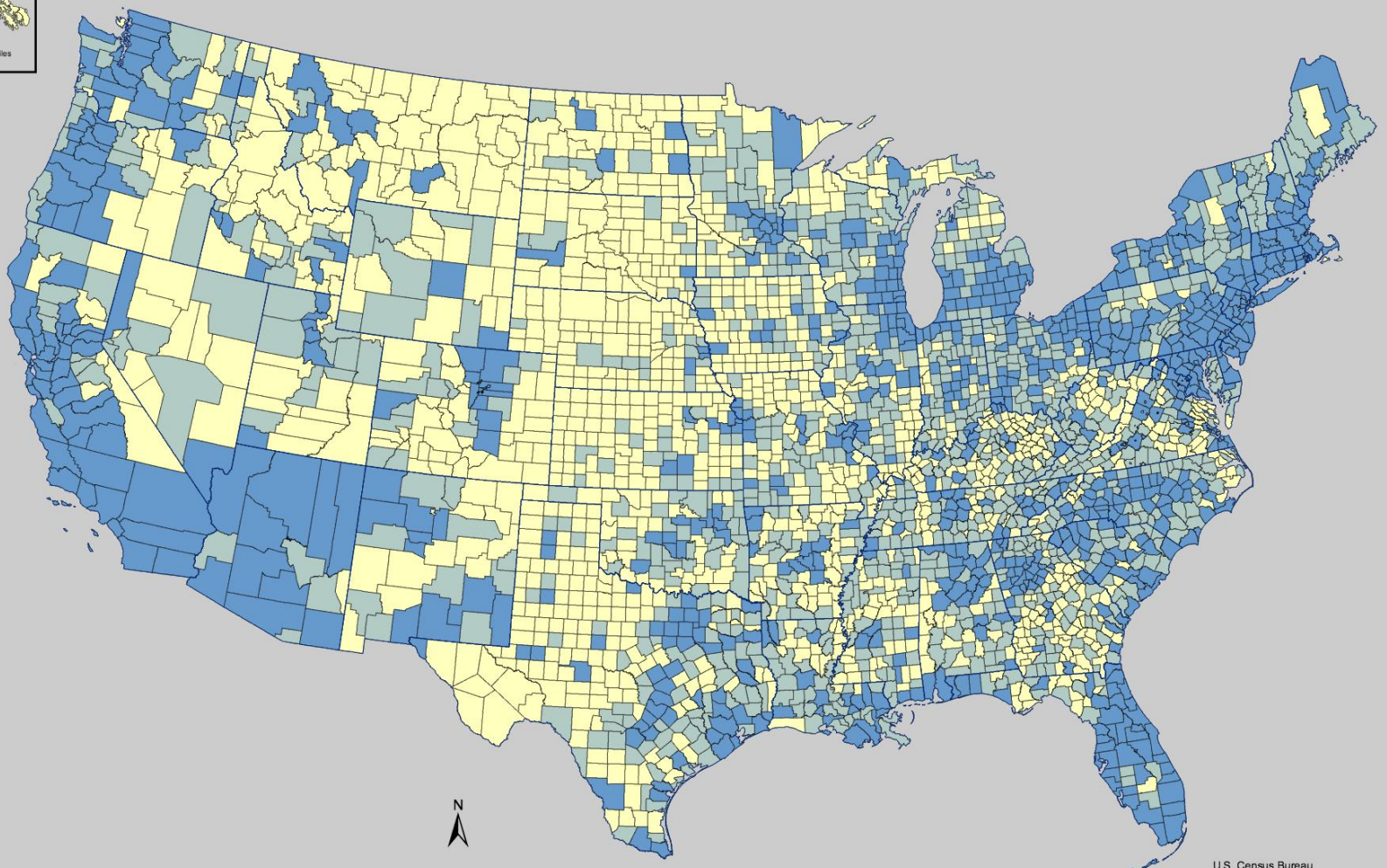
IMPORTANT: ACS Release Schedule – data is released as *averages*:

- 1 Year – areas with a population 65,000+
- 3 Years – areas with a population 20,000+
- 5 Years - all other areas (including census tracts and blockgroups)

E.g., *average* median household income for 2009-2013 (released December, 2014)

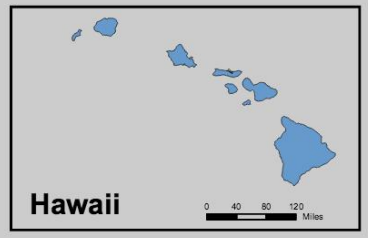
2013 ACS Estimate Type Availability by County





Legend

- 1, 3 and 5-Year Estimates
- 3 and 5-Year Estimates
- 5-Year Estimates Only
- State Boundary



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U.S. Census Bureau
American Community Survey Office
Geography Branch
August 2014

Important Definitions

- Race (discussed earlier)
- Hispanic ethnicity (discussed earlier)
- Housing Unit
- Household
- Income
- Universe

Housing Unit

A house, an apartment, a mobile home or trailer, a group of rooms, or a single room occupied as separate living quarters, or if vacant, intended for occupancy as separate living quarters.
Separate living quarters are those in which the occupants live separately from any other individuals in the building and which have direct access from outside the building or through a common hall. For vacant units, the criteria of separateness and direct access are applied to the intended occupants whenever possible.

Living Quarters

- Housing unit: unit occupied as separate living quarters, or, if vacant, is intended for occupancy as a separate living quarters
- Group quarters
  - Institutionalized population (such as correctional institutions, nursing homes, and juvenile institutions)
  - Noninstitutionalized population (such as college dormitories, military quarters, and group homes)

Household

- Household: all persons who occupy a housing unit
- Householder: the member of a household who lives at the housing unit *and owns or rents the living quarters*

Important: *housing unit* and *household* are TWO different things! Don't get them confused!

Two Types of Households

- **Family Household**: householder plus all persons in the household related by blood, marriage, or adoption

  Can also include:
  - Subfamily *Example*: householder's son and daughter-in-law
  - Nonrelative *Example*: roomers, boarders
- **Nonfamily Household**: persons living alone or with nonrelatives only

Income

- Median (Family/Household) Income: divides income distribution into two equal parts above and below the median (we mostly use this one)
- Per Capita Income: divide total income everyone by the total population

Universe

The total number of units, e.g., individuals, households, businesses, in the population of interest.

This is important for understanding percentages, e.g.,

Know your “universe”! Make sure you understand what is the universe.

Barnstable County, MA

Subject	Number	Percent
MEANS OF TRANSPORTATION AND CARPOOLING		
Workers 16 and over	**99,197**	**100.0**
Car, truck, or van	88,745	89.5
Drove alone	80,672	81.3
Carpooled	8,073	8.1
In 2-person carpool	6,909	7.0
In 3-person carpool	899	0.9
In 4-person carpool	76	0.1
In 5- or 6-person carpool	68	0.1
In 7-or-more-person carpool	121	0.1
Workers per car, truck, or van	1.05	(X)
Public transportation	1,436	1.4
Bus or trolley bus	1,077	1.1
Streetcar or trolley car (público in Puerto Rico)	29	0.0
Railroad	127	0.1
Ferryboat	67	0.1
Taxicab	65	0.1
Motorcycle	35	0.0
Bicycle	318	0.3
Walked	2,616	2.6
Other means	903	0.9
Worked at home	5,144	5.2

Barnstable County, MA

Subject	Number	Percent
SCHOOL ENROLLMENT		
Population 3 years and over enrolled in school	**47,762**	**100.0**
Nursery school, preschool	3,987	8.3
Kindergarten	2,215	4.6
Elementary school (grades 1-8)	22,199	46.5
High school (grades 9-12)	10,869	22.8
College or graduate school	8,492	17.8
EDUCATIONAL ATTAINMENT		
Population 25 years and over	**165,115**	**100.0**
Less than 9th grade	3,304	2.0
9th to 12th grade, no diploma	10,217	6.2
High school graduate (includes equivalency)	44,983	27.2
Some college, no degree	36,356	22.0
Associate degree	14,792	9.0
Bachelor's degree	33,989	20.6
Graduate or professional degree	21,474	13.0
Percent high school graduate or higher	91.8	(X)
Percent bachelor's degree or higher	33.6	(X)

Knowing the "universe" can be tricky – housing tenure example

Housing Unit

Data Set
2010 Census Summary File 1

Table
H4 - TENURE
Universe: Occupied housing units

Total:
Owned with a mortgage or a loan
Owned free and clear
Renter occupied

Population

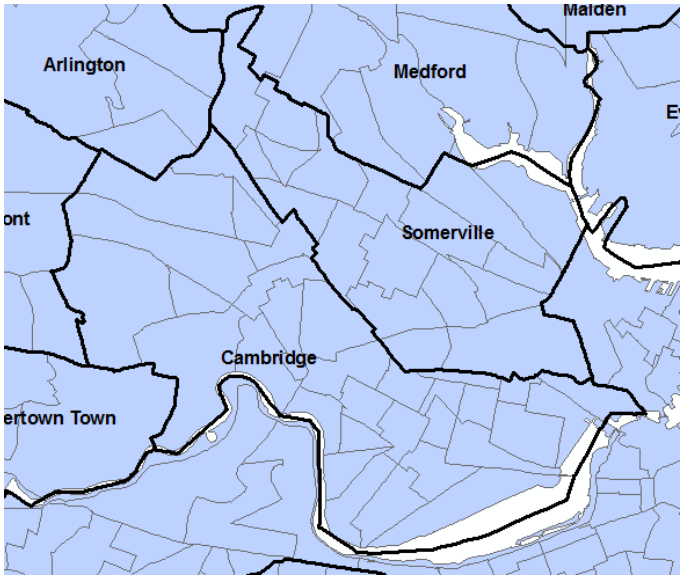
Data Set
2010 Census Summary File 1

Table
H11 - TOTAL POPULATION IN OCCUPIED HOUSING UNITS BY TENURE
Universe: Population in occupied housing units

Total population in occupied housing units:
Owned with a mortgage or a loan
Owned free and clear
Renter occupied

Getting Census Geography and Tables from the US Census Bureau

- Census geography comes from the *TIGER* files
- Census and American Community Survey data come from *American Factfinder*



HH Med Inc	MOE_HH_Med_Inc	GEOid2	GEO#display-label
80143	9661	25017300100	Census Tract 3001, Mid
68940	7912	25017301101	Census Tract 3011.01,
85313	7925	25017301102	Census Tract 3011.02,
32190	7570	25017310100	Census Tract 3101, Mid
65290	9184	25017310200	Census Tract 3102, Mid
47344	14854	25017310300	Census Tract 3103, Mid
46793	5351	25017310400	Census Tract 3104, Mid
56328	9093	25017310500	Census Tract 3105, Mid
58590	8497	25017310601	Census Tract 3106.01,
54764	7071	25017310602	Census Tract 3106.02,
43214	19731	25017310700	Census Tract 3107, Mid
35151	8018	25017311100	Census Tract 3111, Mid
42899	4695	25017311200	Census Tract 3112, Mid

GIS and the census – three concepts to understand:

- **Census geography** – GIS shape files display the geography and contain basic attributes
- **Tables** contain the census data
  - rows (records) and columns (fields)
- You **JOIN** data *tables* to census *geography* based on a common ID field
-

Unique Geographic Identifiers

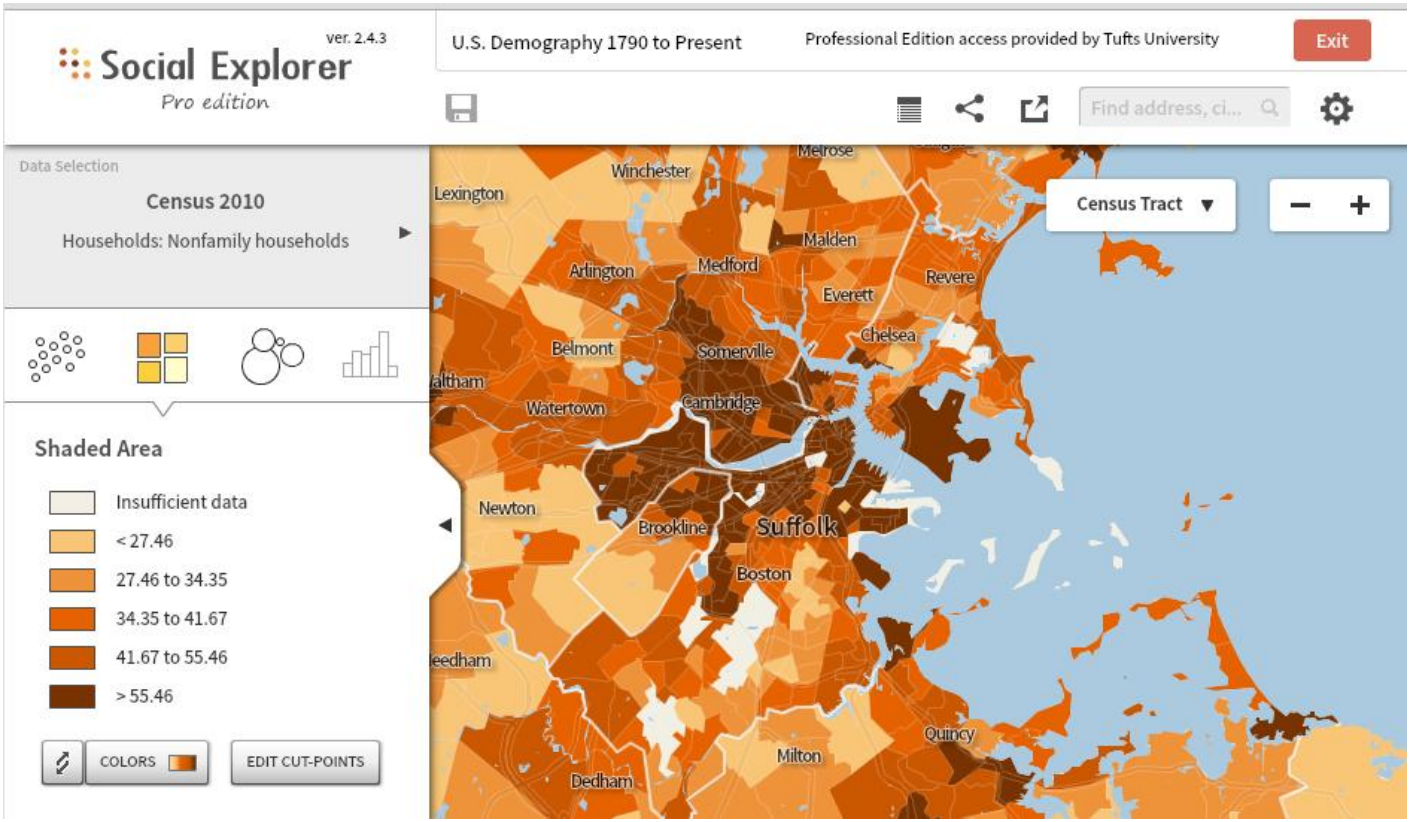
Federal Information Processing Standards (FIPS) Codes

Area	Name	2000 FIPS
State	Massachusetts	25
County	Suffolk	25025
Tract	000601	25025000601

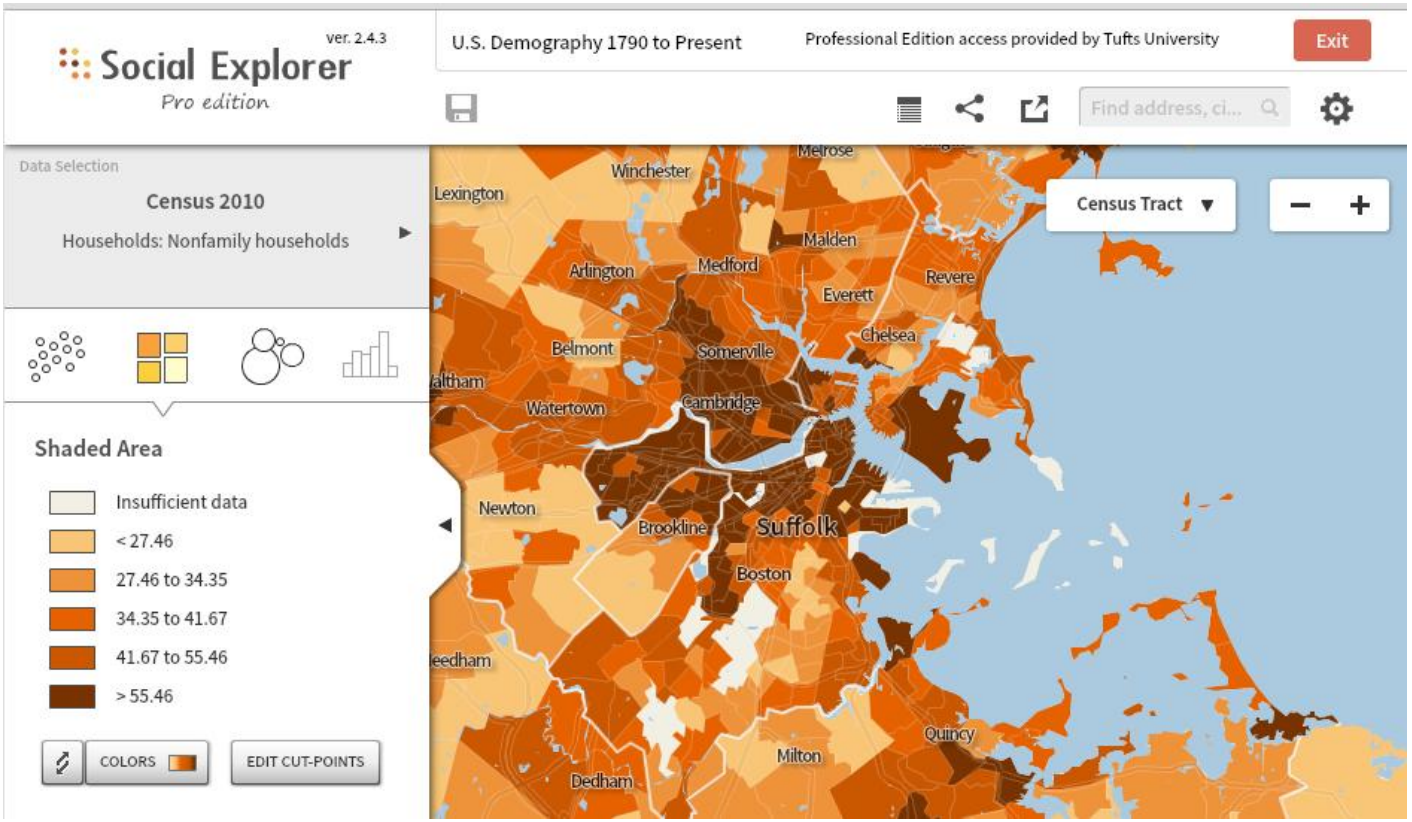
Census TIGER/Line Files

- **Digital geographic database with streets, water, geographic units, etc.**

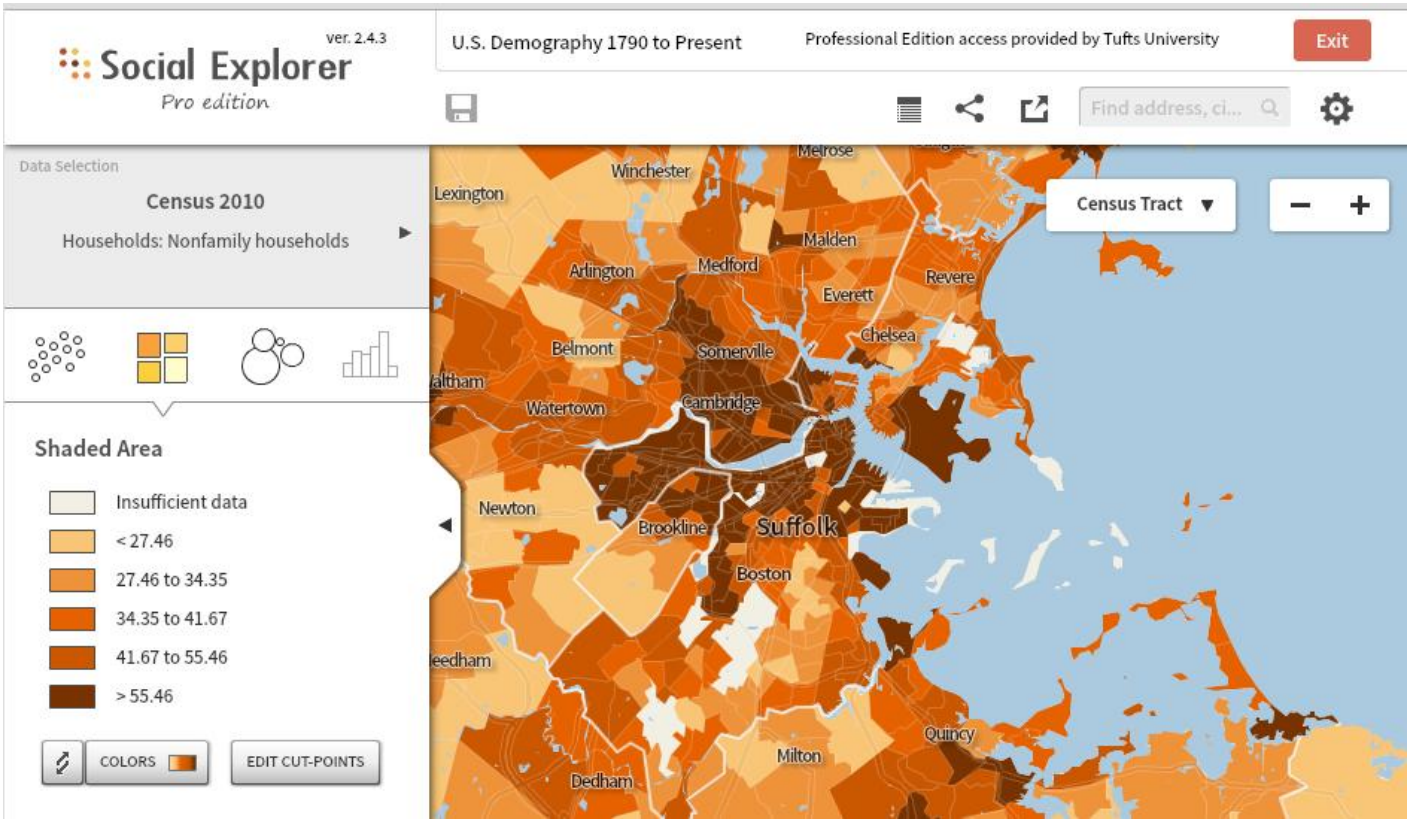
Warning: there is a BIG problem for neighborhood level analysis…



The decennial census data at the census block, block group and tract level is very reliable – why?



But the ACS is very problematic for those small areas. Why?



ACS and Margin of Error

	Census Tract 3.02, Suffolk County, Massachusetts		Census Tract 4.01, Suffolk County, Massachusetts	
	Estimate	Margin of Error	Estimate	Margin of Error
Total: **Workers 16 and Over**	2,321	+/-363	3,280	+/-432
Car, truck, or van:	1,464	+/-361	1,359	+/-275
Drove alone	1,274	+/-380	1,216	+/-285
Carpooled:	190	+/-137	143	+/-130
In 2-person carpool	110	+/-82	143	+/-130
In 3-person carpool	0	+/-127	0	+/-127
In 4-person carpool	74	+/-111	0	+/-127
In 5- or 6-person carpool	0	+/-127	0	+/-127
In 7 or more person carpool	6	+/-9	0	+/-127
Public transportation (excluding taxicab):	747	+/-226	1,583	+/-381
Bus or trolley bus	371	+/-164	588	+/-328
Streetcar or trolley car (carro publico in Puerto Rico)	45	+/-45	606	+/-329
Subway or elevated	250	+/-154	389	+/-181
Railroad	81	+/-113	0	+/-127
Ferryboat	0	+/-127	0	+/-127
Taxicab	0	+/-127	9	+/-15
Motorcycle	0	+/-127	0	+/-127
Bicycle	10	+/-17	154	+/-135
Walked	81	+/-54	65	+/-66
Other means	9	+/-16	72	+/-104
Worked at home	10	+/-15	38	+/-43

Means of transportation for commute – **Tract** Level - ACS 2005-2009 5 year estimates
Universe is workers 16 and over

Exploring Error and the American Community Survey

What is Sampling Error?

Definition

The **uncertainty** associated with an estimate that is based on data gathered from a sample of the population rather than the full population

Illustration of Sampling Error

Estimate average number of children per household for a population with 3 households living in a block:

Household A has	1 child
Household B has	2 children
Household C has	3 children

The block average based on the full population is two children per household: (1+2+3)/3

Conceptualizing Sampling Error

Three different samples of 2 households:

1. Households A and B (1 child, 2 children)
2. Households B and C (2 children, 3 children)
3. Households A and C (1 child, 3 children)

Three different averages based on which sample is used:

1. (1 + 2) / 2 = 1.5 children
2. (2 + 3) / 2 = 2.5 children
3. (1 + 3) / 2 = 2 children

Sampling Error

- Census 2010 is a 100% survey so has smaller error
- ACS data is based on samples – error is larger
- The smaller the geography, the larger the error (because the sample is smaller)
- Especially true for variables that sample a small number of people, e.g., bike commuters

Bottom line for ACS

- More up to date information
- Continuous versus point in time measurement
- 5 year estimates are the most reliable because they have the largest samples
- But…
  - Poorer precision at finer scales (e.g., census tract) or areas of low population (rural areas)
  - Poorer precision for variables with low numbers (e.g., people who bike to work)

How can I see the margin of error?

- Go to the Census web site (census.gov)
- Click on the *Data Tab* and choose American Fact Finder

Community Facts

Find popular facts (population, income, etc.) and frequently requested data about your community.

Enter a state, county, city, town, or zip code:

e.g., Atlanta, GA

GO

Guided Search

Advanced Search

Download Options

U.S. Department of Commerce

United States Census Bureau

AMERICAN FactFinder

MAIN | COMMUNITY FACTS | GUIDED SEARCH | ADVANCED SEARCH | DO

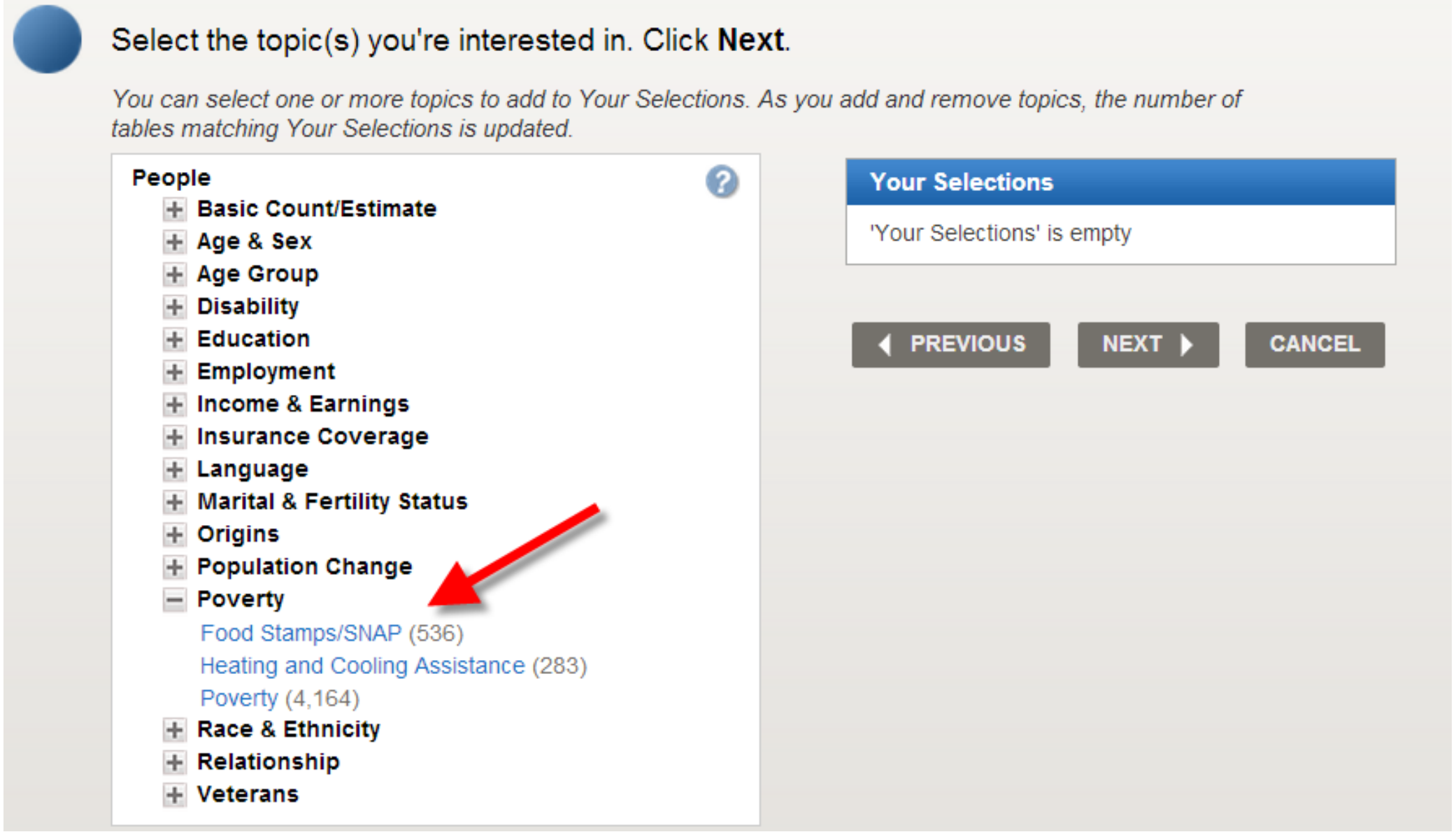
Guided Search - Step-by-step access to Census Information

1 Start | 2 Topics | 3 Geographies | 4 Race/Ethnic Groups | 5

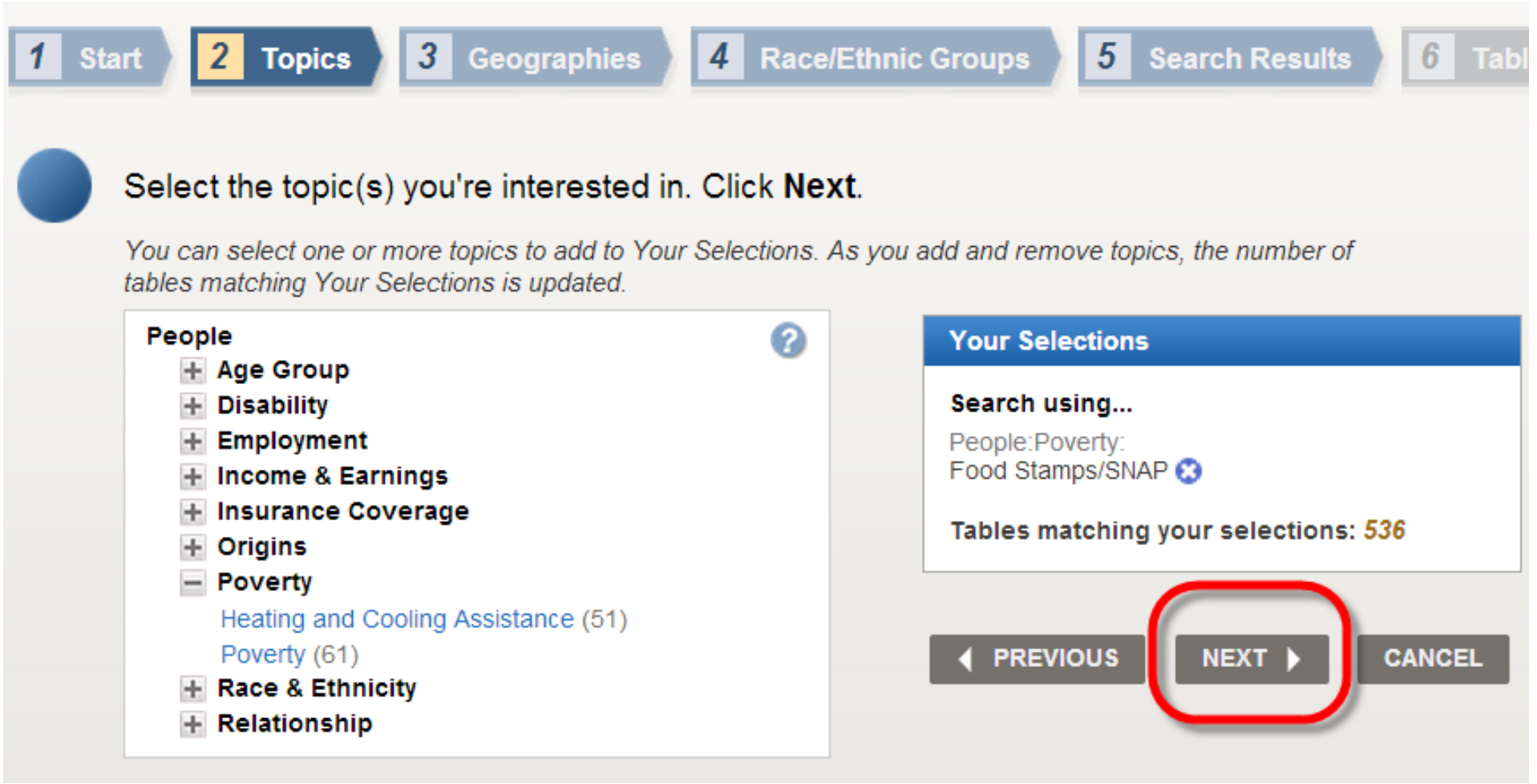
Choose from one of the following and click **Next**.

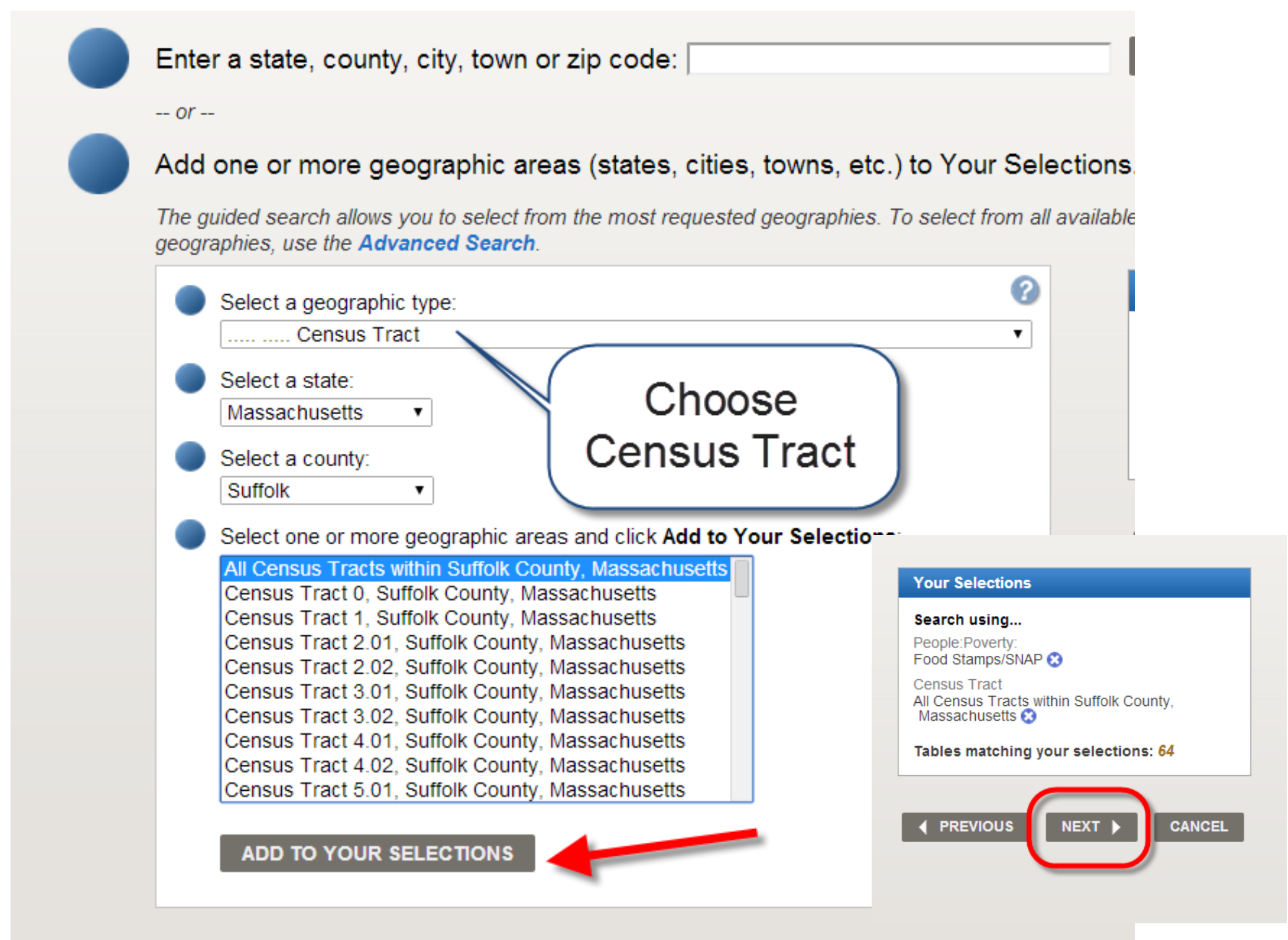
- (•) I'm looking for information about **people**.
  (age, sex, income, poverty, education, ...)
- ( ) I'm looking for information about **housing**.
  (housing units, houshold type, value of home, ...)

Choose a topic…



Click Next when you've chosen a topic…




Enter a state, county, city, town or zip code:
-- or --
Add one or more geographic areas (states, cities, towns, etc.) to Your Selections
The guided search allows you to select from the most requested geographies. To select from all available geographies, use the Advanced Search.
Select a geographic type:
.... Census Tract
Select a state:
Massachusetts
Select a county:
Suffolk
Choose Census Tract
Select one or more geographic areas and click Add to Your Selections
All Census Tracts within Suffolk County, Massachusetts
Census Tract 0, Suffolk County, Massachusetts
Census Tract 1, Suffolk County, Massachusetts
Census Tract 2.01, Suffolk County, Massachusetts
Census Tract 2.02, Suffolk County, Massachusetts
Census Tract 3.01, Suffolk County, Massachusetts
Census Tract 3.02, Suffolk County, Massachusetts
Census Tract 4.01, Suffolk County, Massachusetts
Census Tract 4.02, Suffolk County, Massachusetts
Census Tract 5.01, Suffolk County, Massachusetts
ADD TO YOUR SELECTIONS
Your Selections
Search using...
People:Poverty:
Food Stamps/SNAP
Census Tract
All Census Tracts within Suffolk County, Massachusetts
Tables matching your selections: 64
PREVIOUS
NEXT
CANCEL

1 Start | 2 Topics | 3 Geographies | 4 Race/Ethnic Groups | 5 Search Results | 6

Select a table, file or document from these top 10 search results:

Table, File or Document Title	ID	Dataset
SELECTED ECONOMIC CHARACTERISTICS	DP03	2012 ACS 5-year estimates
FOOD STAMPS/SNAP	S2201	2012 ACS 5-year estimates
RECEIPT OF SUPPLEMENTAL SECURITY INCOME (SSI), CASH PUBLIC ASSISTANCE INCOME, OR FOOD STAMPS/SNAP IN THE PAST 12 MONTHS BY HOUSEHOLD TYPE FOR CHILDREN UNDER 18 YEARS IN HOUSEHOLDS	B09010	2012 ACS 5-year estimates
PUBLIC ASSISTANCE INCOME OR FOOD STAMPS/SNAP IN THE PAST 12 MONTHS FOR HOUSEHOLDS	B19058	2012 ACS 5-year estimates
RECEIPT OF FOOD STAMPS/SNAP IN THE PAST 12 MONTHS BY PRESENCE OF PEOPLE 60 YEARS AND OVER FOR HOUSEHOLDS	B22001	2012 ACS 5-year estimates
RECEIPT OF FOOD STAMPS/SNAP IN THE PAST 12 MONTHS BY PRESENCE	B22002	2012 ACS 5-

Subject	Census Tract 1, Suffolk County, Massachusetts						
	Total		Households receiving food stamps		Households not receiving food stamps		
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	E
Households	1,510	+/-100	125	+/-82	1,385	+/-120	
With one or more people 60 years and over	32.4%	+/-6.6	55.2%	+/-33.0	30.3%	+/-7.5	
With children under 18 years	16.2%	+/-6.1	20.0%	+/-27.0	15.8%	+/-6.2	
POVERTY STATUS IN THE PAST 12 MONTHS							
Below poverty level	14.2%	+/-5.8	7.2%	+/-13.7	14.8%	+/-6.2	
DISABILITY STATUS							
With one or more people with a disability	19.4%	+/-8.0	36.0%	+/-32.2	17.9%	+/-7.8	

Bottom line…ACS data at the tract level can be highly unreliable!

Subject	Census Tract 1, Suffolk County, Massachusetts					
	Total		Households receiving food stamps		Households not receiving food stamps	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Households	1,510	+/-100	125	+/-82	1,385	+/-120
With one or more people 60 years and over	32.4%	+/-6.6	55.2%	+/-33.0	30.3%	+/-7.5
With children under 18 years	16.2%	+/-6.1	20.0%	+/-27.0	15.8%	+/-6.2

Researchers are just beginning to understand the implications of this…

Subject	Census Tract 1, Suffolk County, Massachusetts					
	Total		Households receiving food stamps		Households not receiving food stamps	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Households	1,510	+/-100	125	+/-82	1,385	+/-120
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With children under 18 years	16.2%	+/-6.1	20.0%	+/-27.0	15.8%	+/-6.2

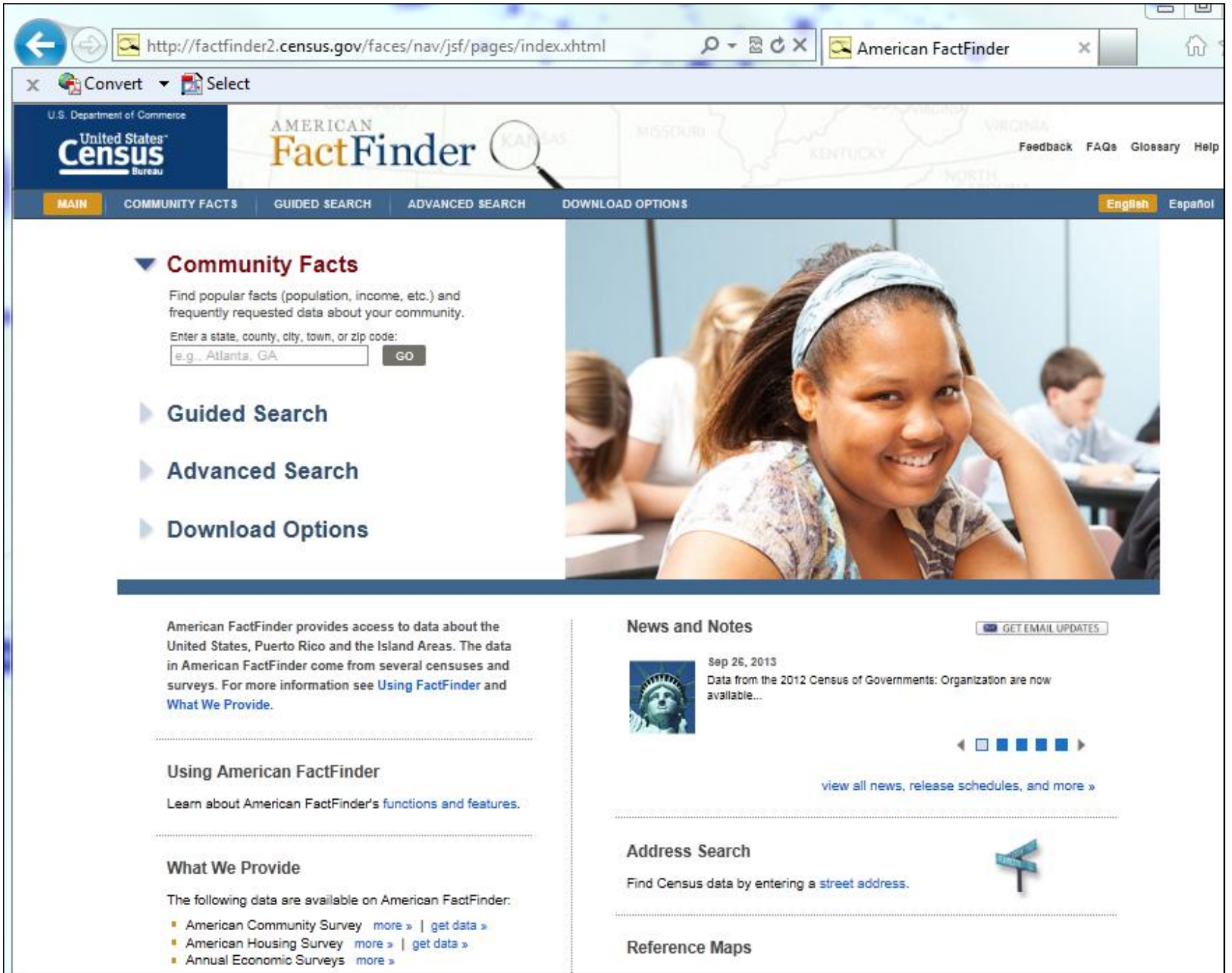
Take home points

- There are two major Census Bureau products used for neighborhood analysis:
  - The Decennial Census
    - Basic data
    - By block, block group, and tract
    - Once a decade, one point in time
  - The American Community Survey
    - Lots of interesting data
    - By block group and tract – but likely unreliable at those levels!
    - More up to date – 5-year rolling estimates

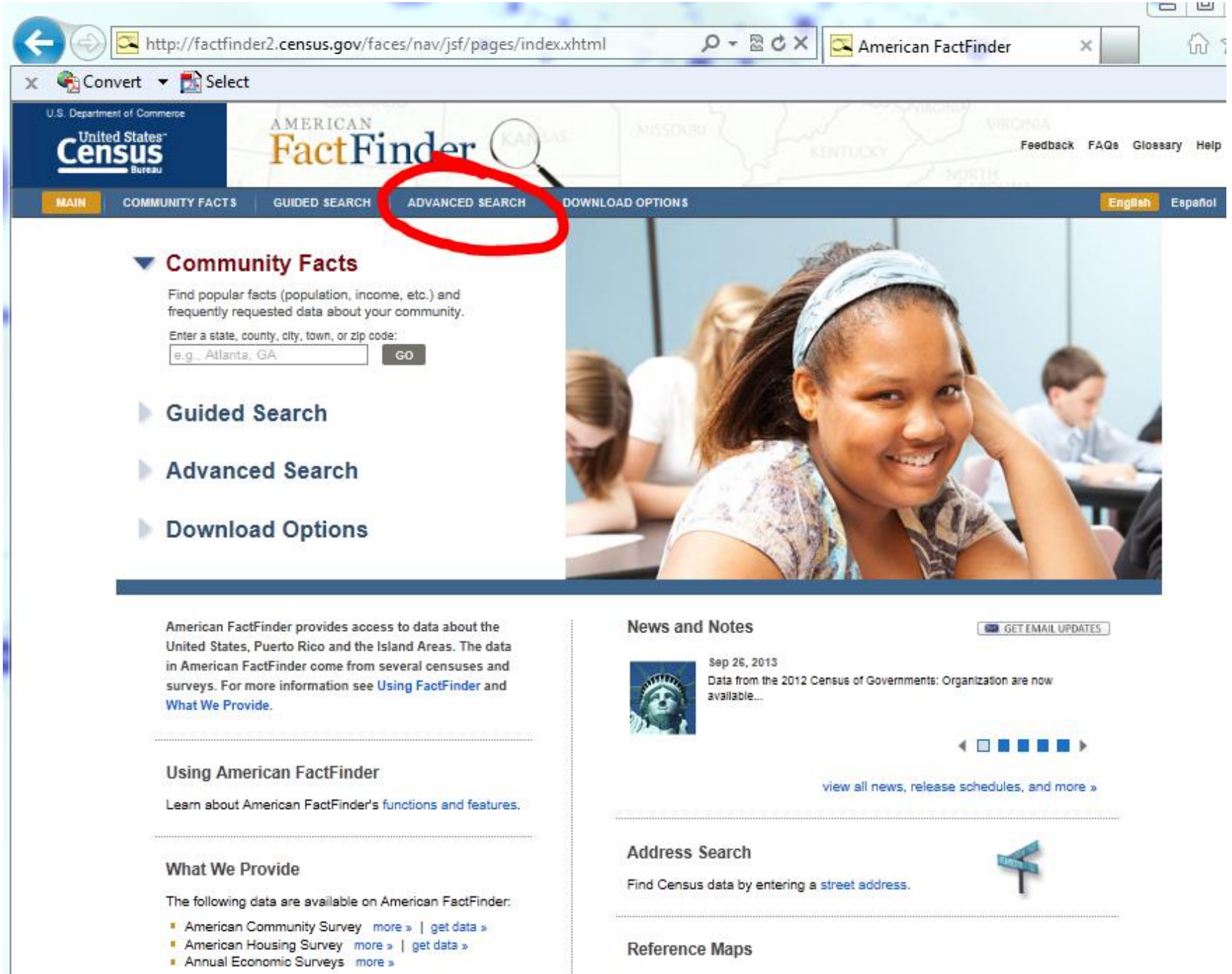
Basic Steps to use American Factfinder

1. Start at: http://factfinder2.census.gov
2. Advanced Search
3. “Geographies” make selections
4. “Topics” - select a data set
5. Select data tables
6. View selected
7. Print or download

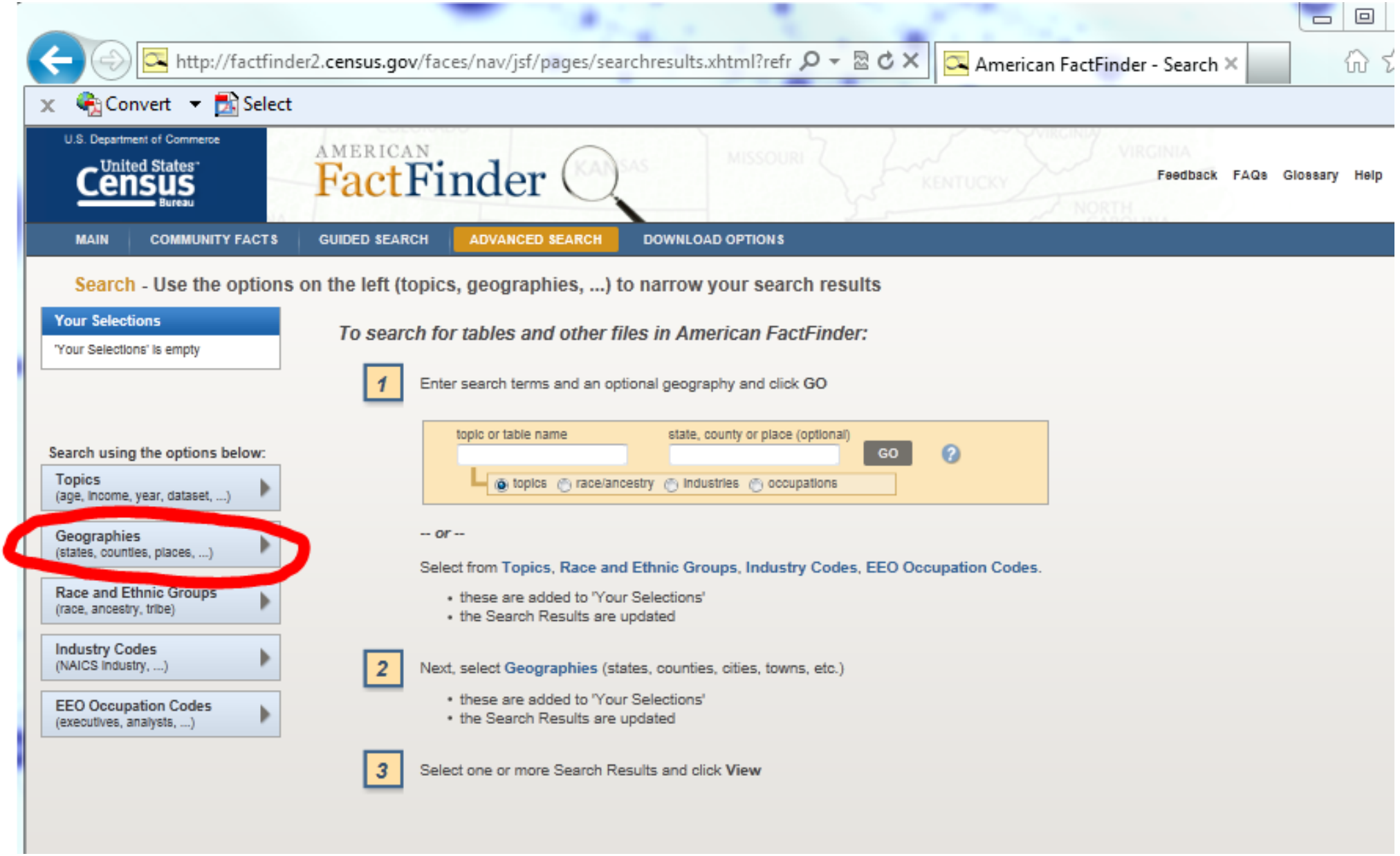
Start at http://factfinder2.census.gov



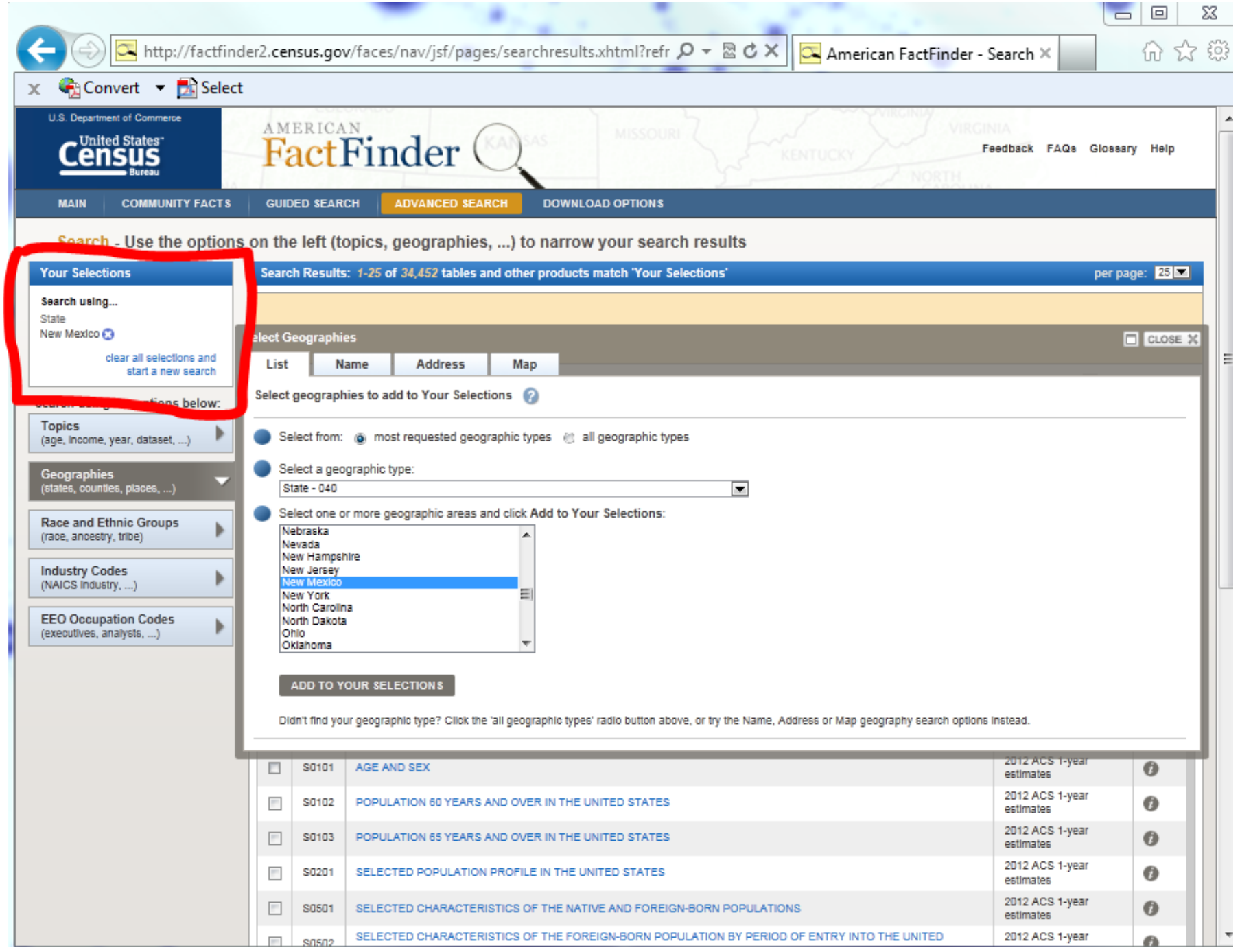
Select Advanced Search



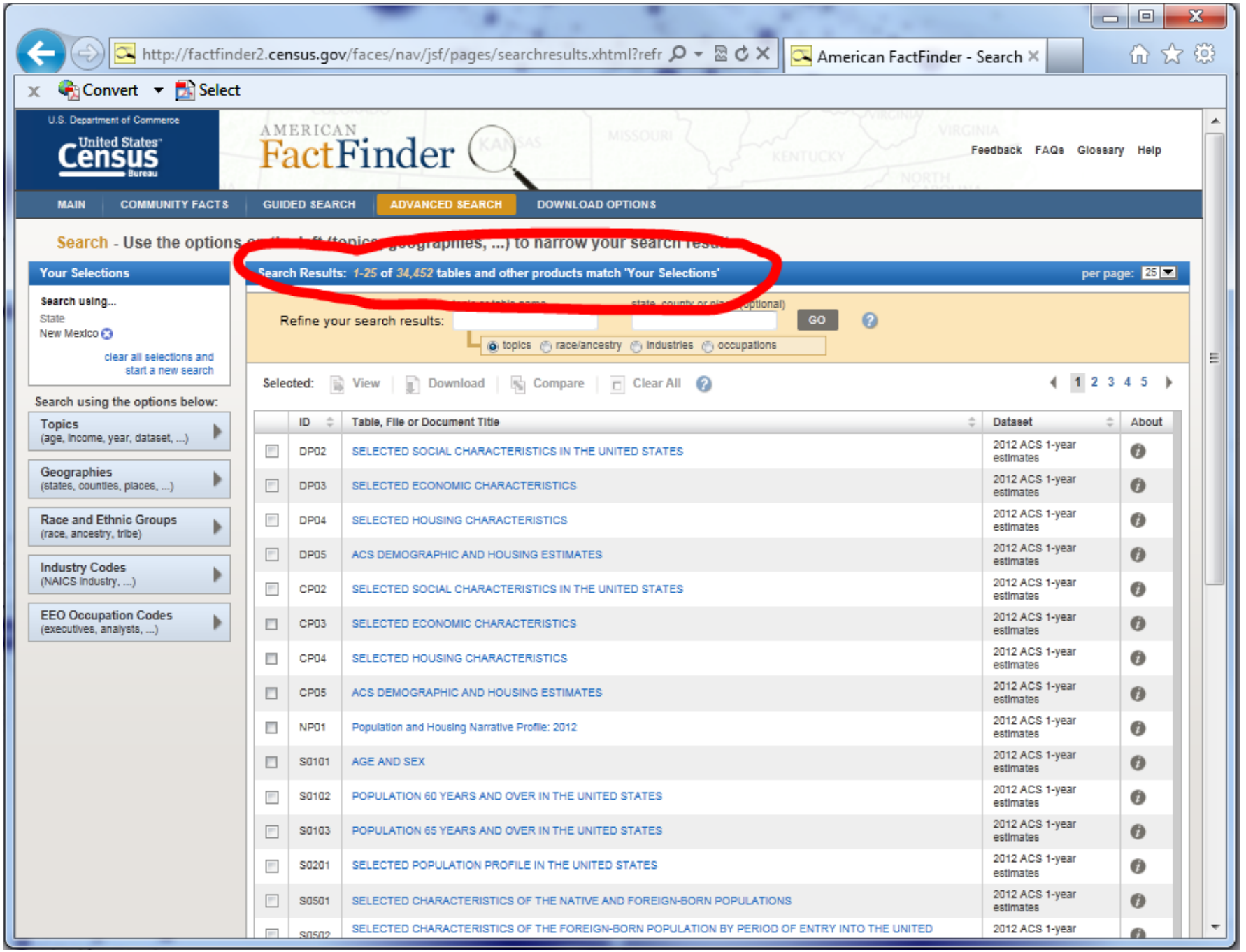
Select Geographies



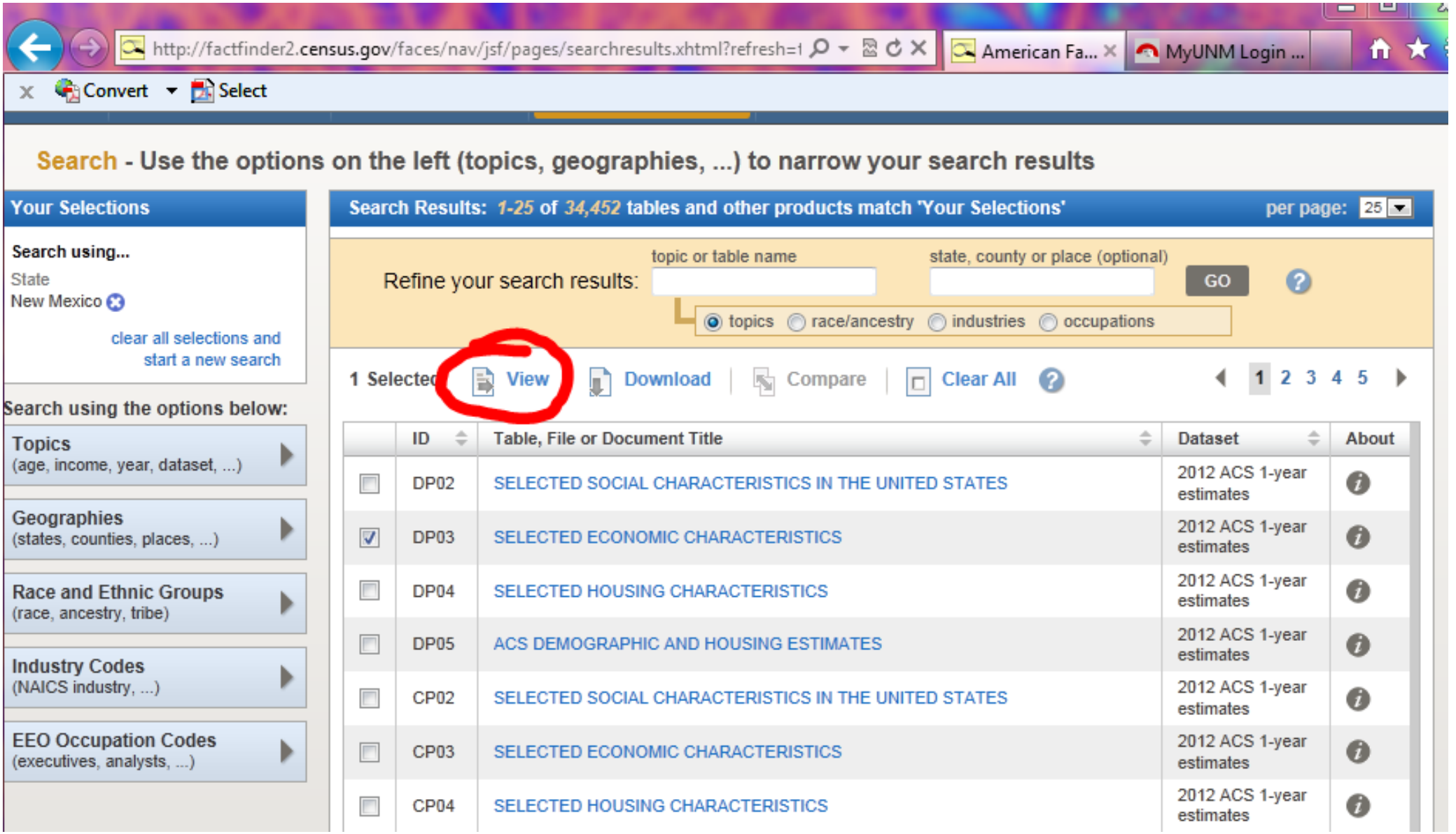
Note: Your Selections



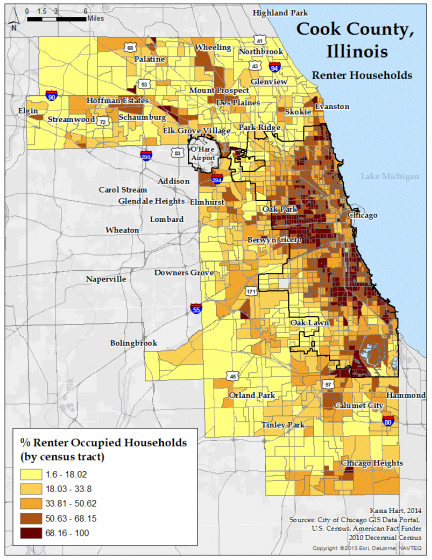
Narrow down tables with the “Topics”

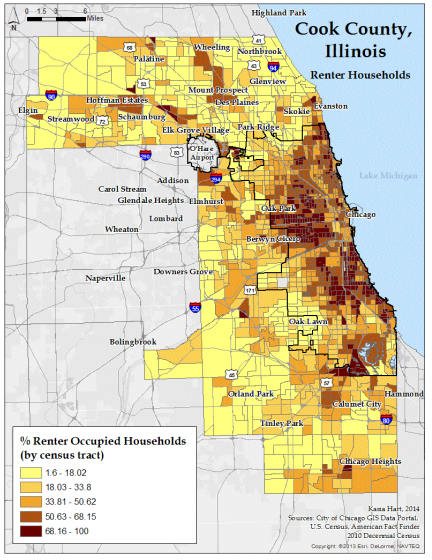


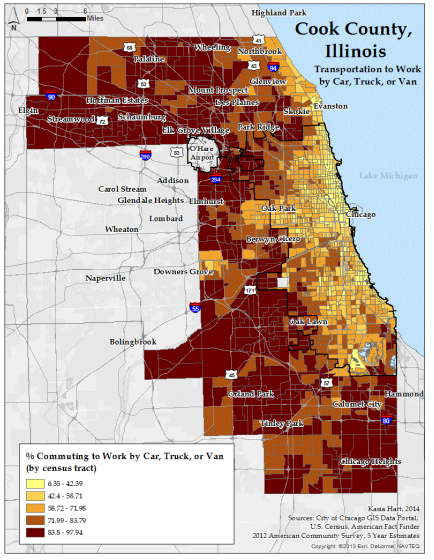
Check the table and then view

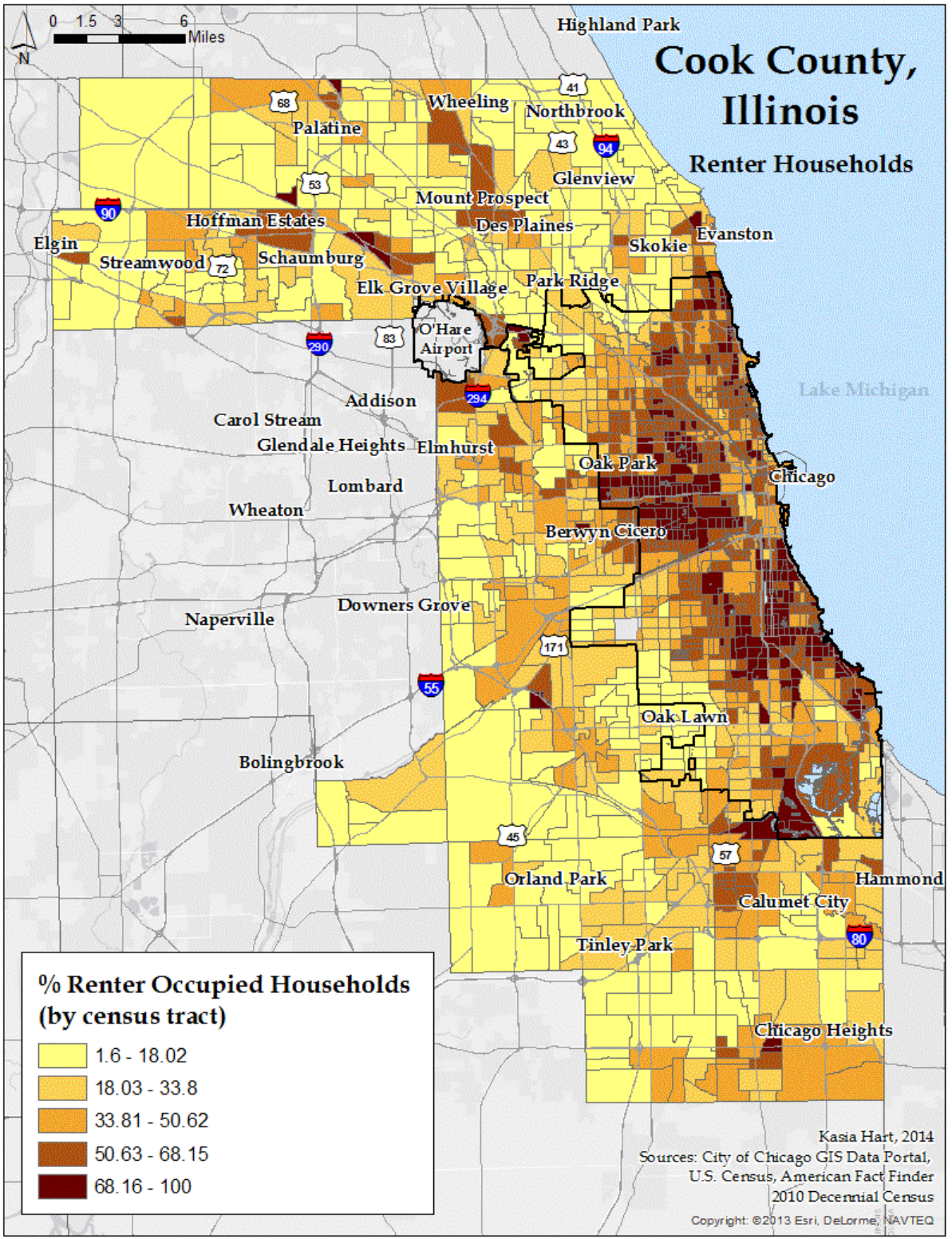


Now your turn, to make cool maps!



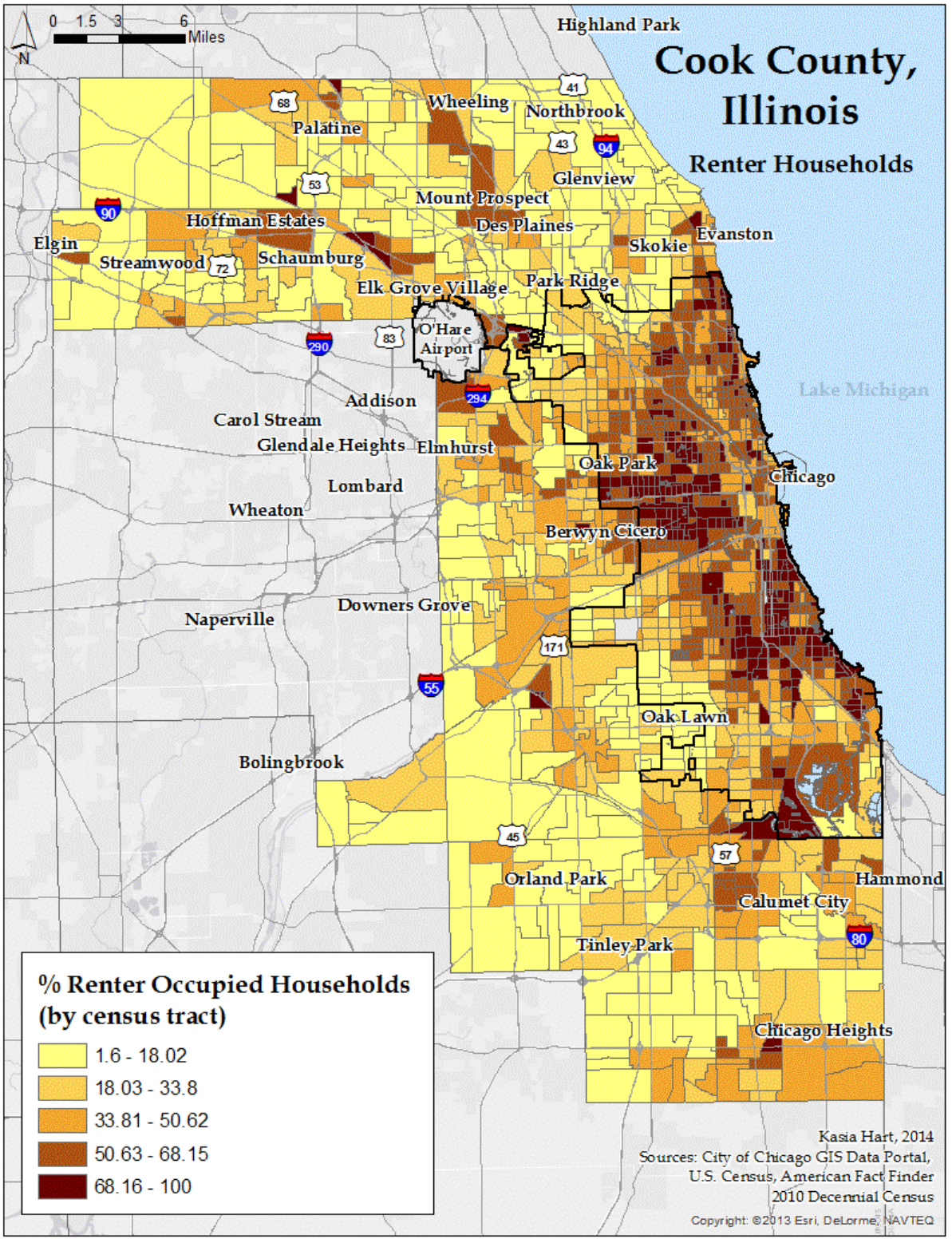






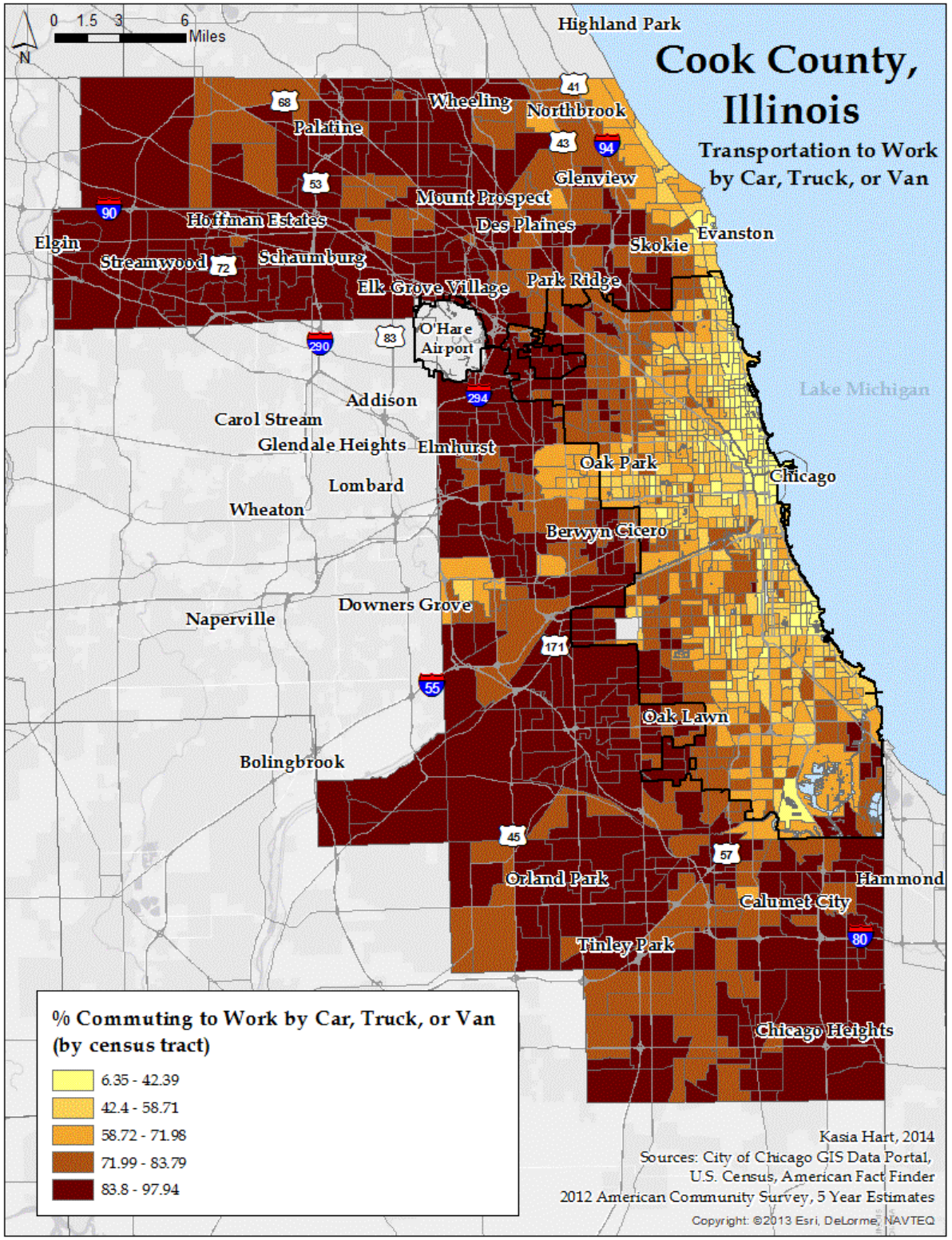
Chicago and Cook County

Renters



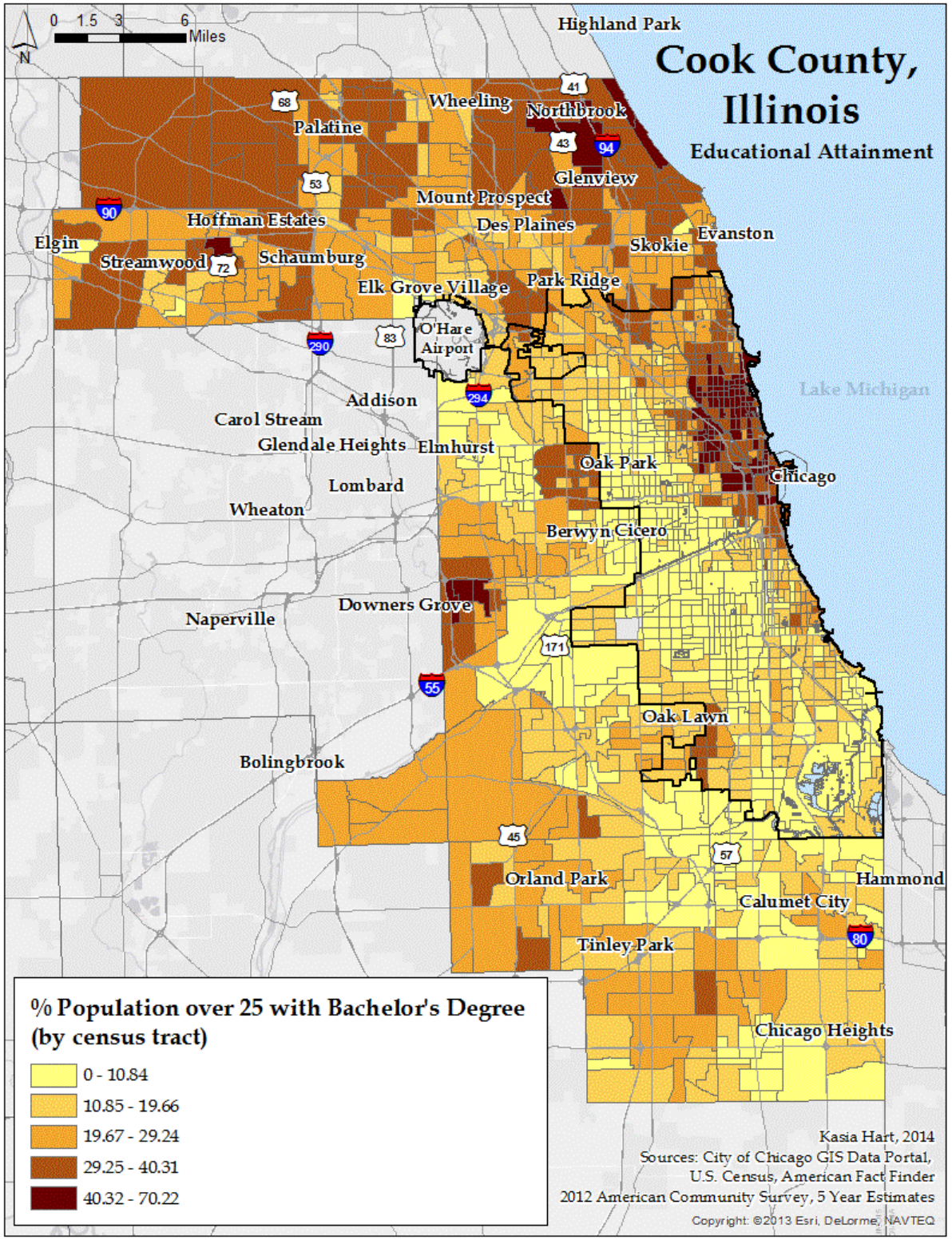
Chicago and Cook County

Renters



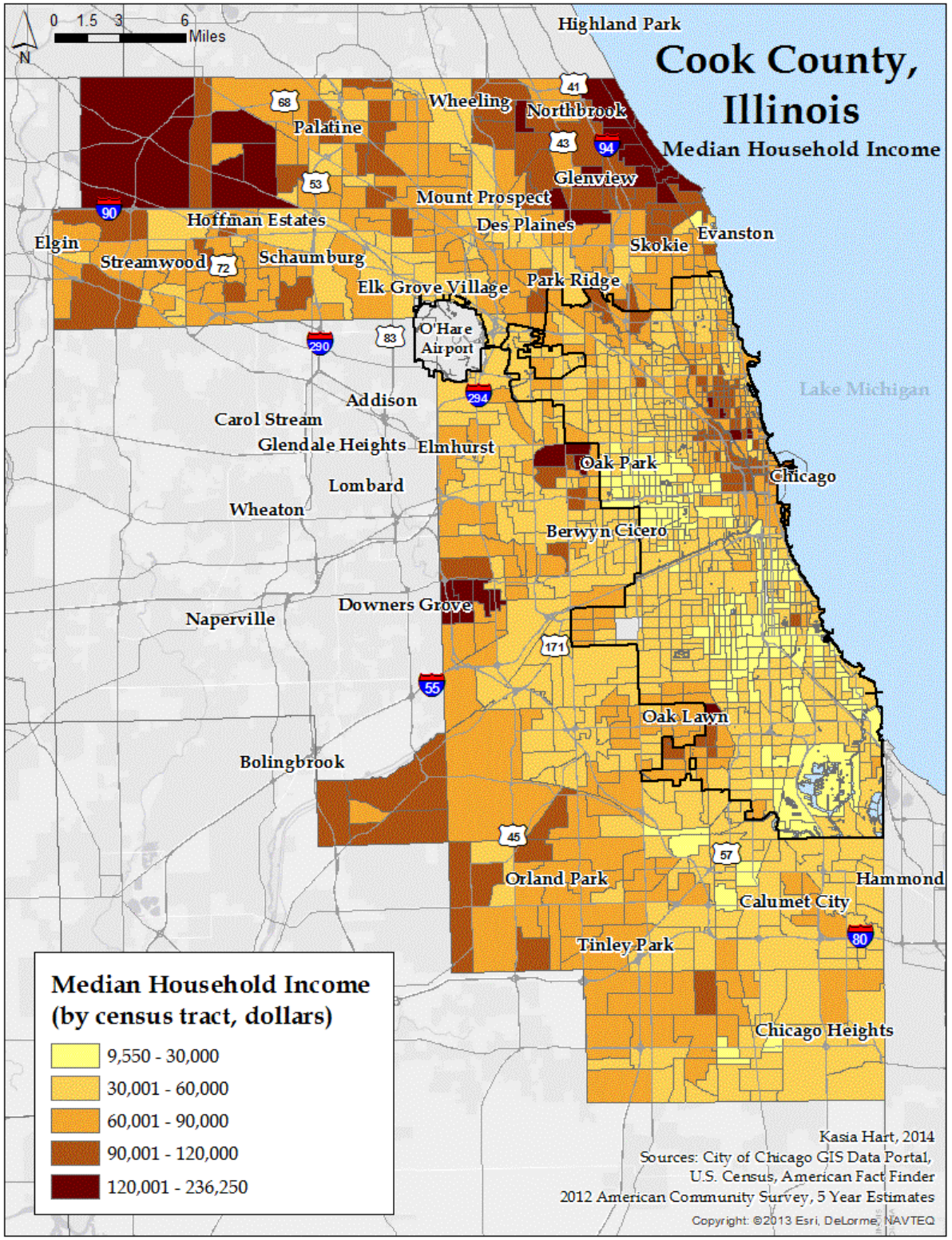
Chicago and Cook County

Driving to work



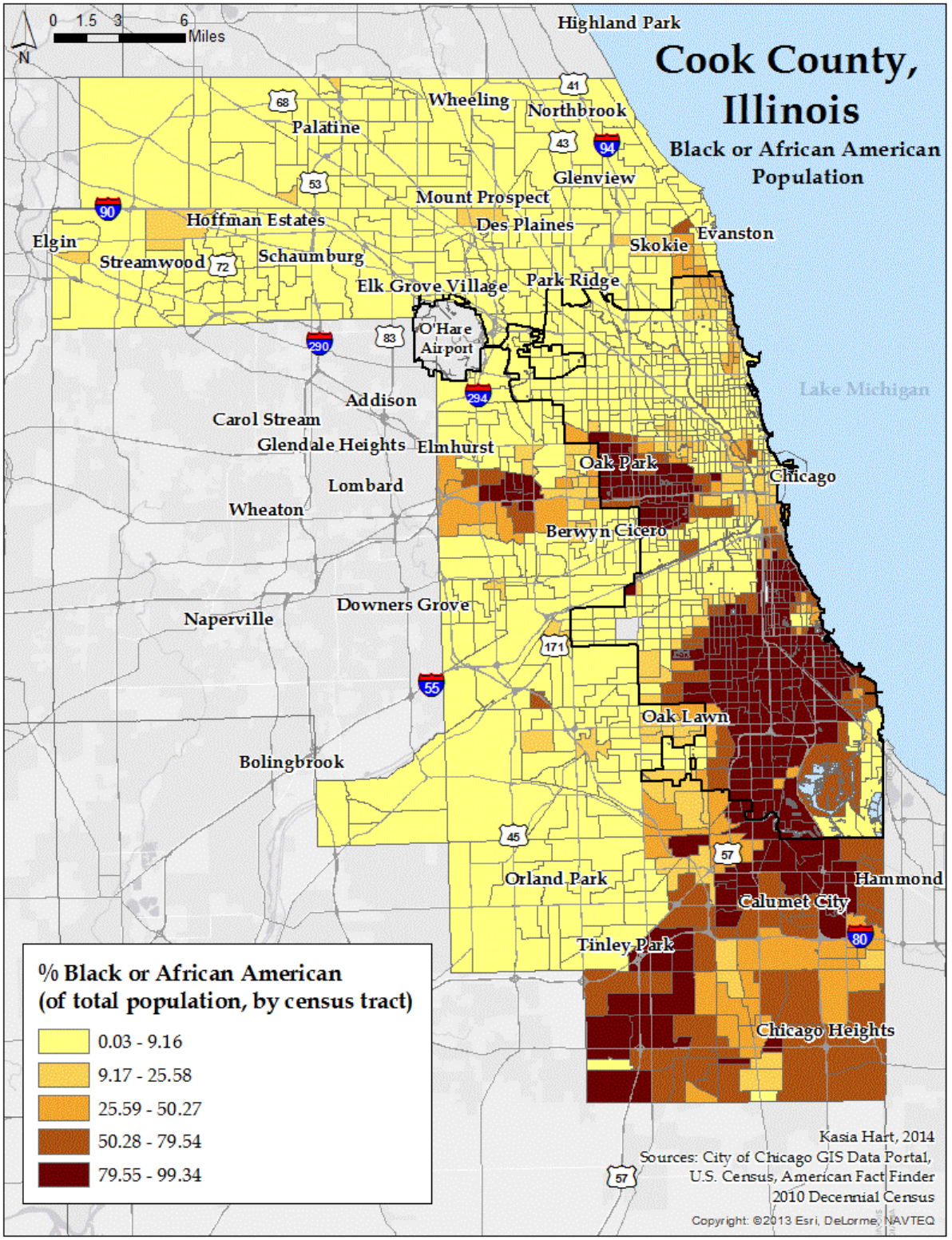
Chicago and Cook County

Educational attainment



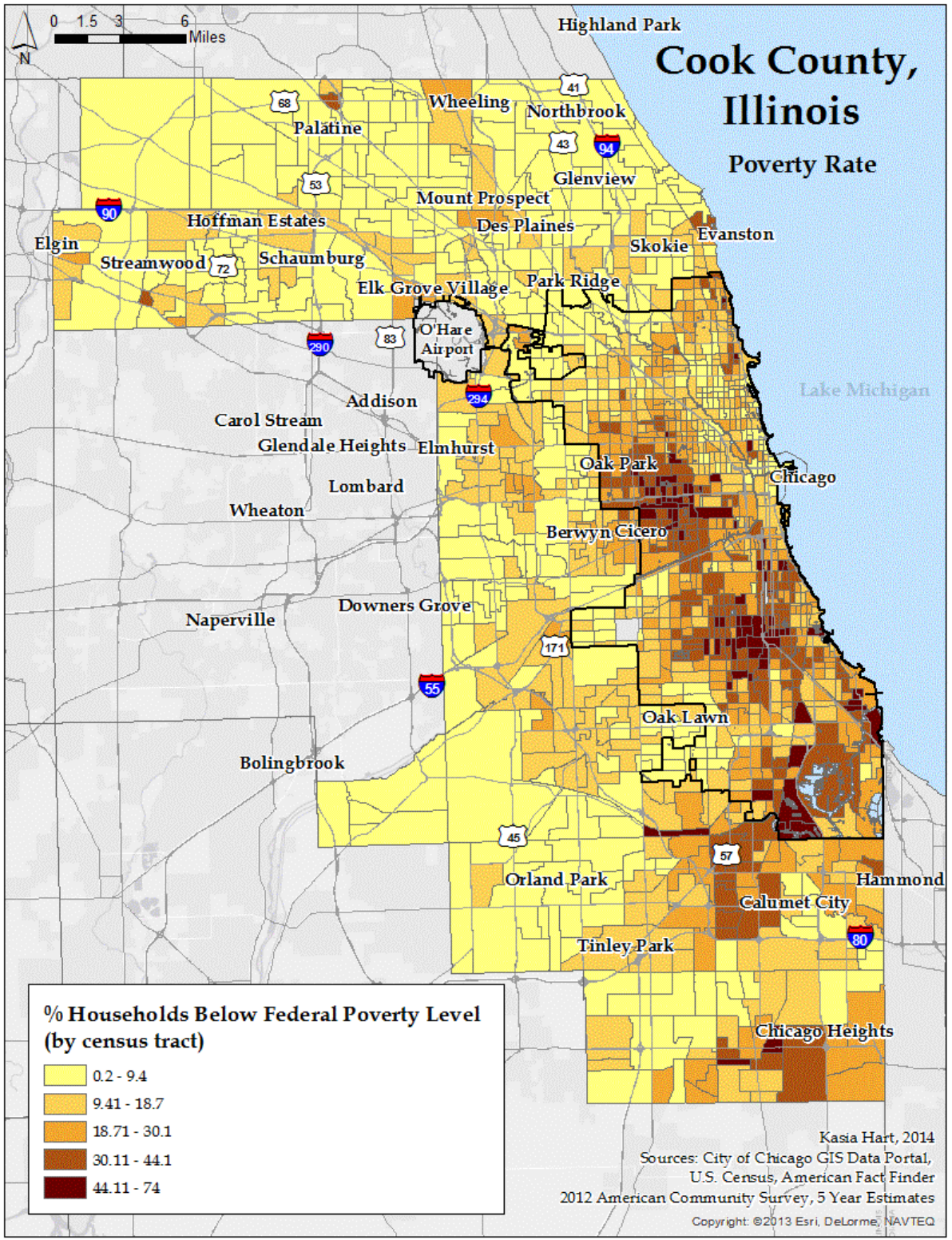
Chicago and Cook County

Median Household Income



Chicago and Cook County

% African American



Chicago and Cook County

Poverty

Census Population Estimates Program

Warning: Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

http://www.census.gov/popest/estimates.html