Using Census Data in your GIS

Craig Best
Supervisory Geographer
Kansas City Regional Office



Objectives

- Understand Census Geographic Identifiers
- Understand how to obtain geographic files
- Understand how to obtain Census data products
- Understand how to map the data
- Understand who to contact with questions



Requisites

- GIS application that can use and join ESRI Shapefiles to database tables
- Internet access for downloading data

- ArcGIS v9.2
- Microsoft Access/Excel 2007
- Today's demo requires about 1 gb of disk space



Agenda

- Getting Started
- 2. Introduce Census Geography and the Geographic Identifiers
- 3. Accessing the TIGER Data
- 4. Accessing the Data
 - American Factfinder Method
 - SF1 ASCII Data Method
- 5. Mapping The Data



Getting Started



Census Mission

 Our Mission - To serve as the leading source of quality data about the nation's people and economy.



What Data We Collect & When

- Population & Housing Census every 10 years
- Economic Census every 5 years
- Census of Governments every 5 years
- American Community Survey annually
- Our Many Surveys both demographic and economic
- Economic Indicators various





Census vs. Survey

- Census is a "complete enumeration of a population"
- Surveys are based on a sample of the population



Lots of Data/Different Geography

- Survey data are at a high level of geography
- Unemployment data are good for metropolitan area, state, and nation use
- Not available at the county or city level, or lower



My Focus Today

- Subcounty data
- Data that cover all land area within a county or city



Data Top Two List

- 1. 2010 Decennial Census Data
- 2. American Community Survey Data



American Community Survey (ACS)

- ACS replaced the Census "long form" after Census 2000
- We ask about....

•Age	Income and benefits	Disabilities
•Sex		Where you work and
	Health insurance	how you get there
•Race		
	Education	Where you live and
Family and		how much you pay for
Relationship	Veteran status	some essentials



ACS Estimates

- Sample size just under 3,000,000 HUs year
- 1-year estimates
 - Published for selected geographic areas with populations of 65,000 or greater
- 3-year estimates
 - Published for selected geographic areas with populations of 20,000 or greater
- 5-year estimates
 - Published for small geographic areas down to block group



ACS Data Availability

- Currently, only the 1-year estimates are available in AFF2
- Expect 3 and 5 year estimates to be available by the end of the year.



2010 Decennial Data

- Based upon the 2010 Census
- 100% data, the same questions asked of every household
- Not Estimates, actual counts
- Available for all census geographic areas down to census block



Starting the GIS Project

- 1. Determine what data you want to map
- Determine what geographic area you want to map
- 3. Download geographic shapefiles
- 4. Download demographic data
- 5. Make the data "GIS Ready"
- 6. Join the data in ArcMap



Census Geography and the Geographic Identifiers



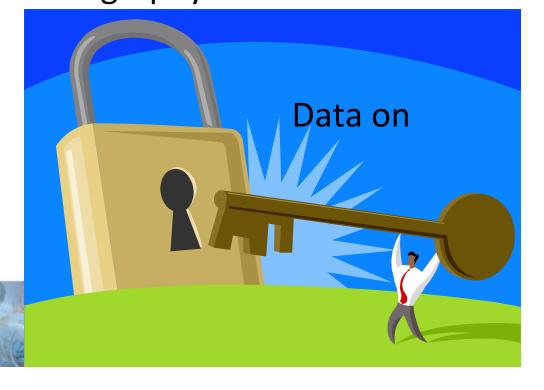
Geographic Identifier (GEOID)

 Every piece of Census Geography has a unique numeric code.

Every piece of Census Geography has data

associated with it.

 GEOID is the key to to putting Census the map!

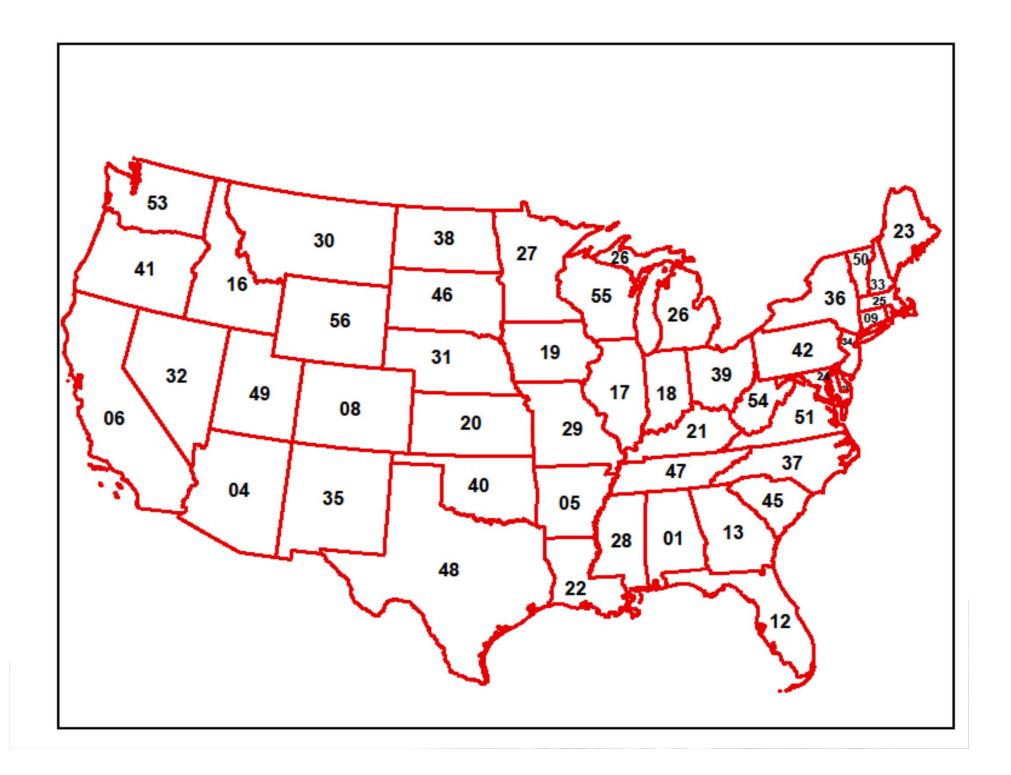


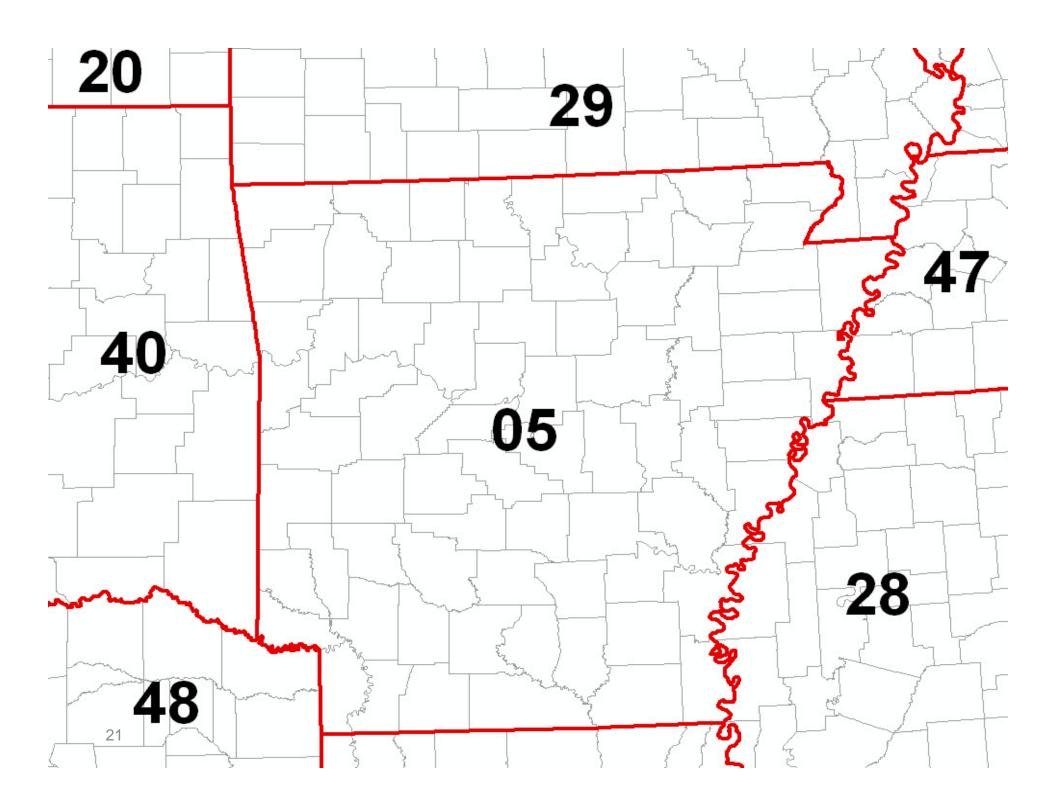


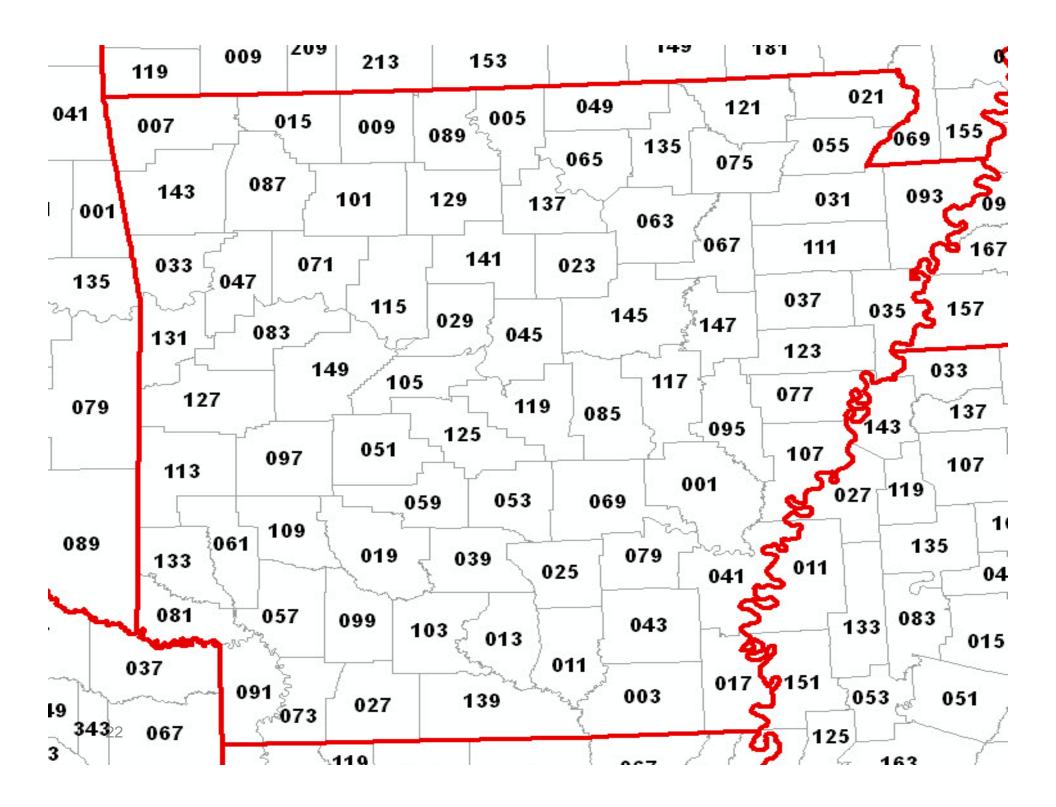
What do you mean by Census Geography?

- State, County, City, Township, American Indian Areas
- Census tracts, block groups, blocks
- School Districts (Elementary, Secondary, Unified)
- 111th Congressional District
- State Legislative Districts (Upper/Lower)
- Voting District







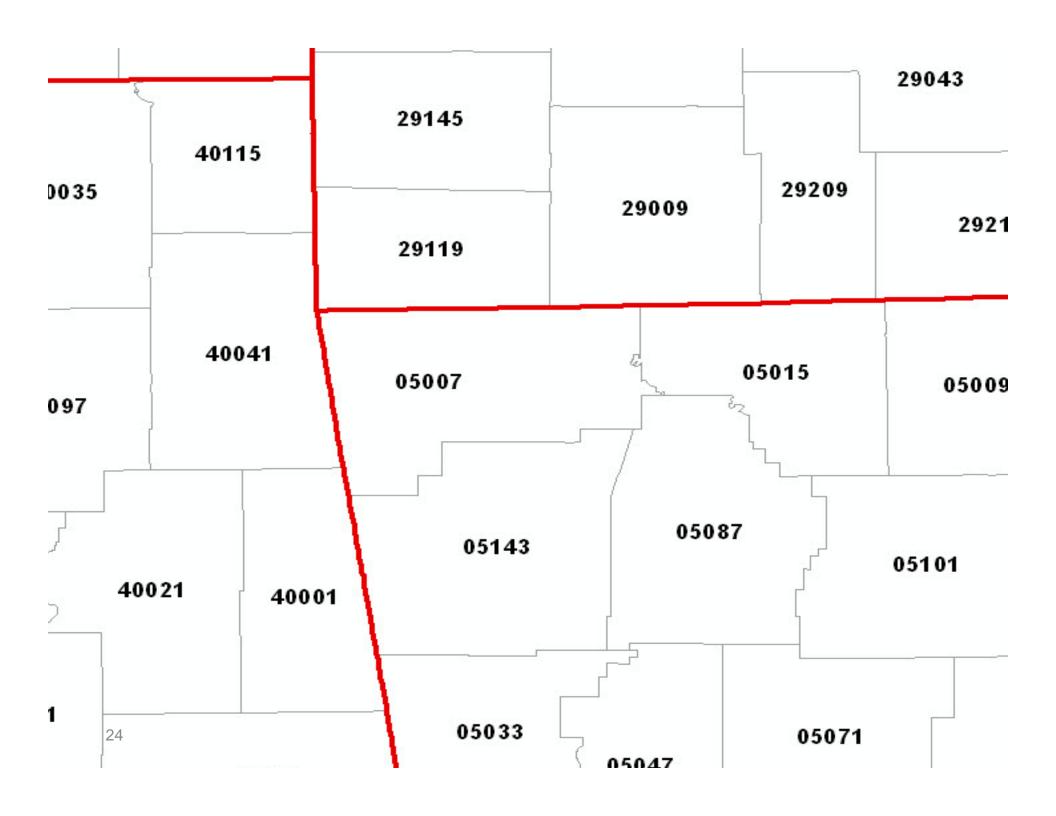


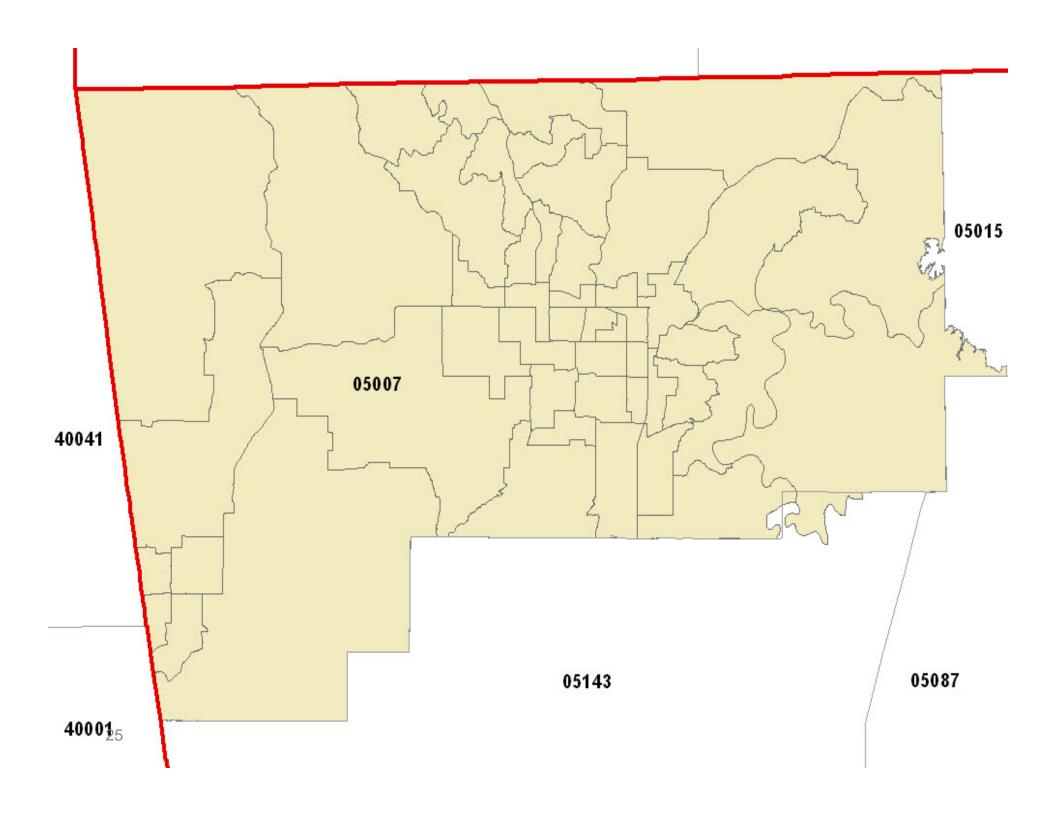
GEOID MATH

19 + 153 = 19153

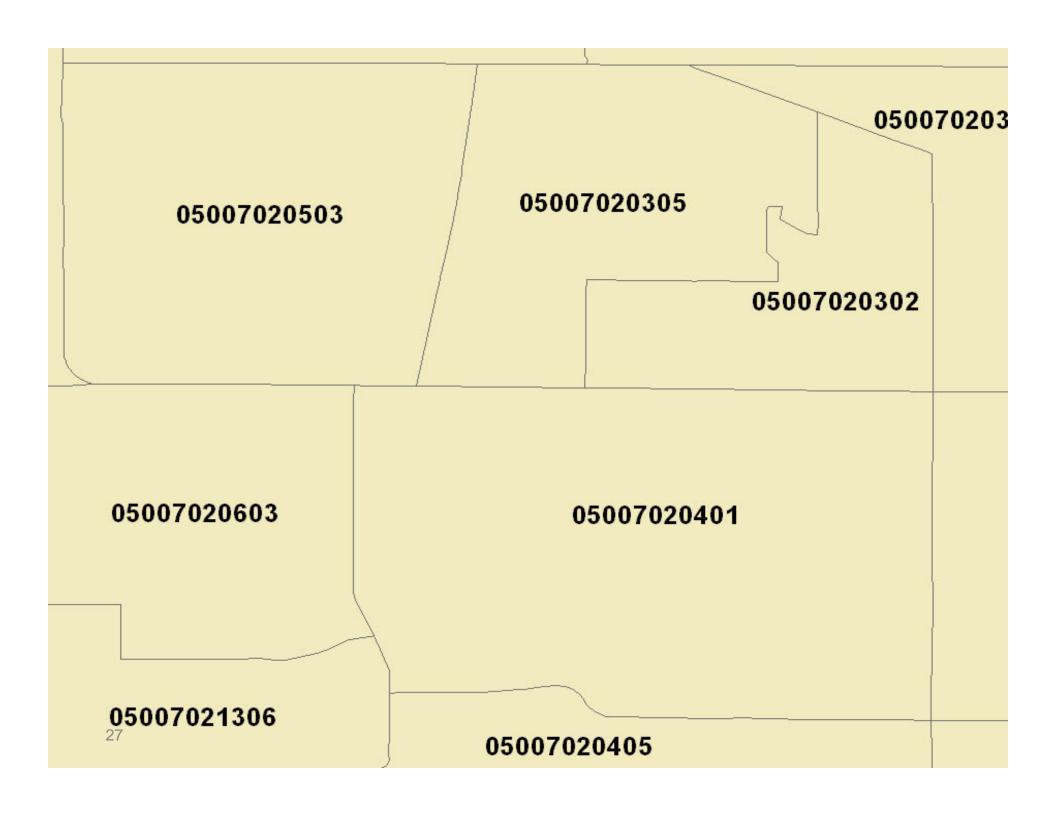


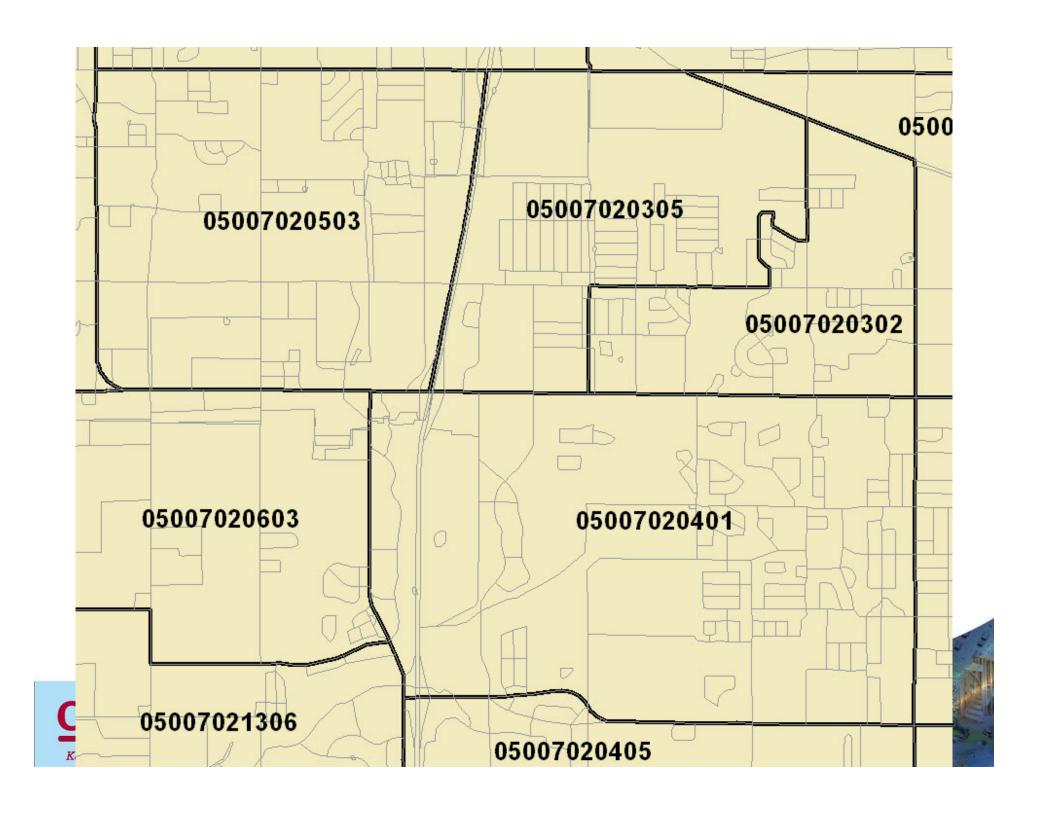


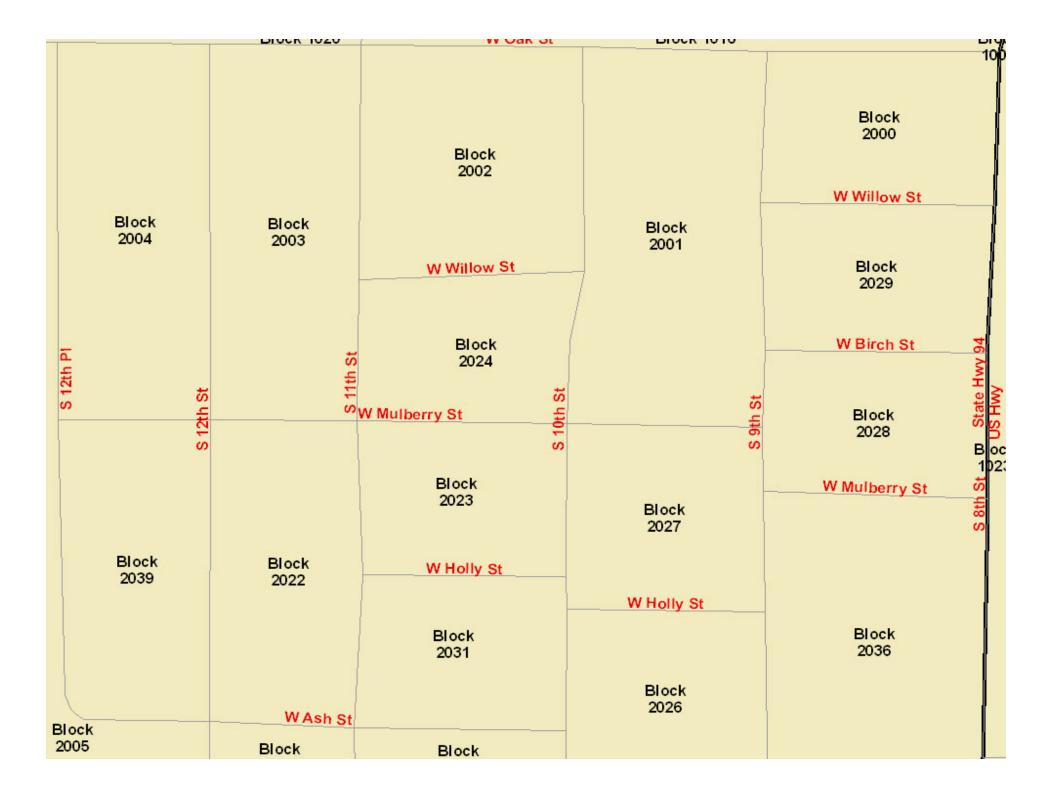


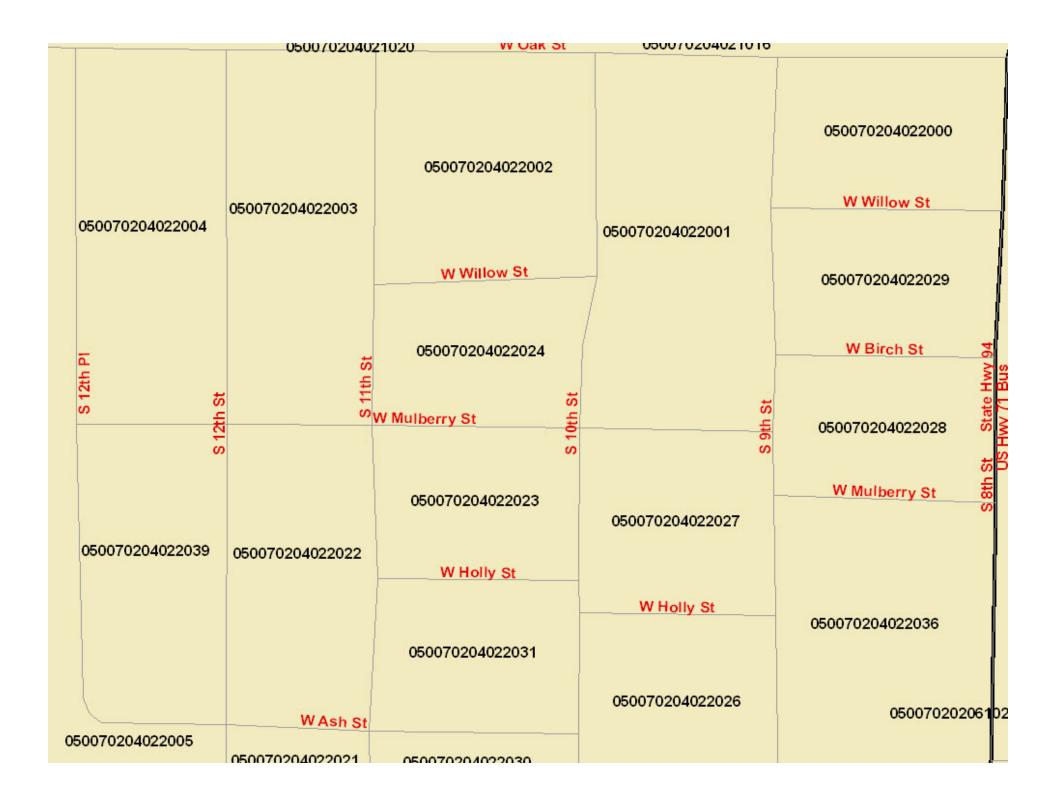








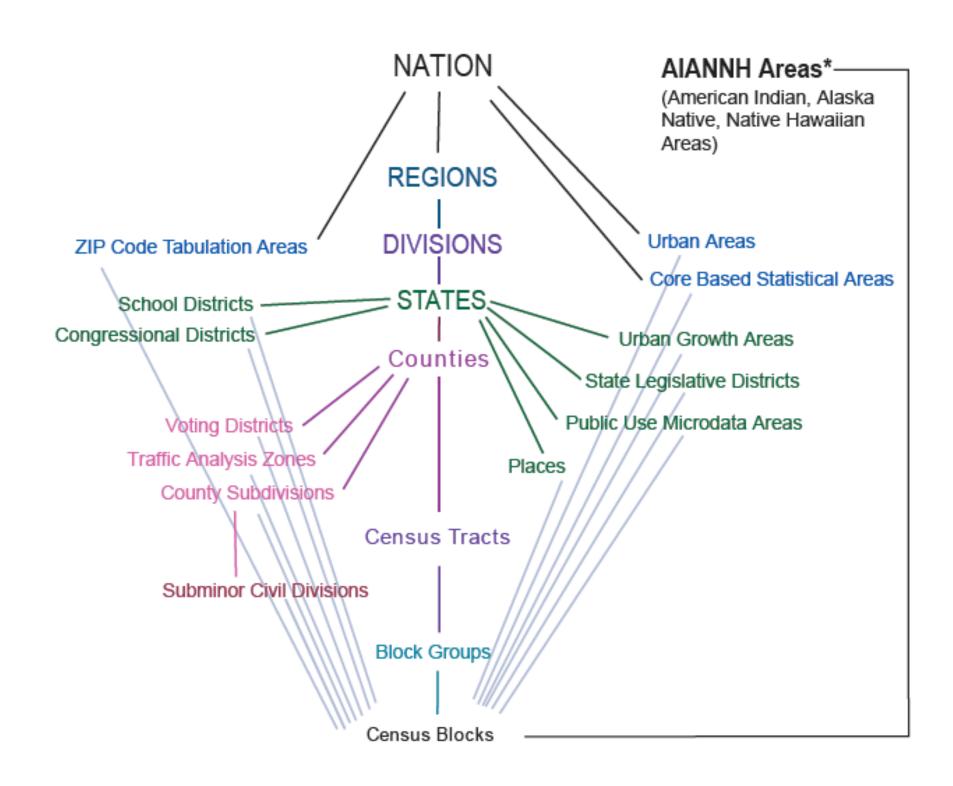




GEOID10

- In the Census TIGER/Line data, concatenation is already done for you
- GEOID10 holds the concatenated value



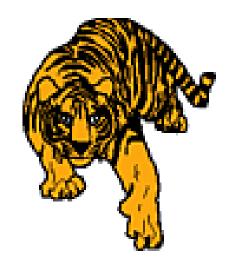


Summary Level Codes

Summary Level Code	Summary Level Name	GEOID	TIGER/Line Shapefile
040	State	STATE	tl 2010 <state fips=""> state10.shp</state>
050	State-County	STATE + COUNTY	tl_2010_ <state fips="">_county10.shp</state>
060	State-County-County Subdivision	STATE + COUNTY + COUSUB	tl_2010_ <state fips="">_cousub10.shp</state>
*101	State-County-County Subdivision-Place/Remainder-Census Tract-Block Group-Block	STATE + COUNTY + TRACT + BLOCK	tl_2010_ <state fips="">_tabblock10.shp tl_2010_<state-county fips="">_tabblock10.shp</state-county></state>
*140	State-County-Census Tract	STATE + COUNTY + TRACT	tl 2010 <state fips=""> tract10.shp</state>
*150	State-County-Census Tract-Block Group	STATE + COUNTY + TRACT + BLKGRP	tl_2010_ <state fips="">_bg10.shp</state>
160	State-Place	STATE + PLACE	tl 2010 <state fips=""> place10.shp</state>
250	American Indian Area/Alaska Native Area/Hawaiian Home Land		tl_2010_ <state fips="">_aiannh10.shp</state>
251	American Indian Area-Tribal Subdivision/Remainder		tl_2010_ <state fips="">_aiannh10.shp</state>
252	American Indian Area/Alaska Native Area (Reservation or Statistical Entity Only)		tl_2010_ <state fips="">_aiannh10.shp</state>
254	American Indian Area (Off-Reservation Trust Land Only)/Hawaiian Home Land		tl_2010_ <state fips="">_aiannh10.shp</state>
256	American Indian Area-Tribal Census Tract		tl_2010_ <state fips="">_aiannh10.shp</state>
258	American Indian Area-Tribal Census Tract-Tribal Block Group		tl_2010_ <state fips="">_aiannh10.shp</state>
500	State-Congressional District (111th)	STATE + CD	tl_2010_ <state fips="">_cd111.shp</state>
610	State-State Legislative District (Upper Chamber)	STATE + SLDU	tl_2010_ <state fips="">_sldu10.shp</state>
620	State-State Legislative District (Lower Chamber)	STATE + SLDL	tl_2010_ <state fips="">_sldl10.shp</state>
700	State-County-Voting District/Remainder	STATE + COUNTY + VTD	tl_2010_ <state-county fips="">_vtd10.shp</state-county>
860	5-Digit ZIP code Tabulation Area	ZCTA	tl_2010_ <state fips="">_zcta510.zip</state>
950	State-School District (Elementary)/Remainder	STATE + SDELM	tl_2010_ <state fips="">_elsd10.shp</state>
960	State-School District (Secondary)/Remainder	STATE + SDSEC	tl_2010_ <state fips="">_scsd10.shp</state>
970	State-School District (Unified)/Remainder	STATE + SDUNI	tl 2010 <state fips=""> unsd10.shp</state>







Census TIGER/Line Files



The History of TIGER

- Built after the 1980 Census to solve serious mapping issues
- First deployed in support of 1990 Census
- TIGER/Line almost an after thought
 - Desktop GIS didn't really exist in the late
 1980s



Time Line

- 1990 TIGER Built and deployed to support 1990 Census
 - Updates of legal and statistical boundaries
 - Features, names, address ranges
 - First release of TIGER/Line data



Time Line

- 1990s, built and maintained the Master Address File (MAF)
- Updated TIGER to geocode new addresses
- Updated legal/statistical geography
- Conversion from NAD27 to NAD83



Time Line

- 2000s.....
 - Migration to COTS technology
 - Spatial Accuracy enhancement, 7.6m CE95
 - Sources: state and local GIS data, imagery
 - Updated legal/statistical geography



Time Line

- 2010s.....
 - Continued partnering with state and local partners to obtain GIS data
 - Continued address development by incorporating local address sources
 - Census road updates through GPS enabled field data collection



The Original TIGER/Line

- From late 1980s through early 2000s, TIGER/Line was a series of flat ASCII data files
- Required a 3rd party software to convert to a specific format
- The TI in TIGER, Topologically Integrated



Current/Future TIGER/Line

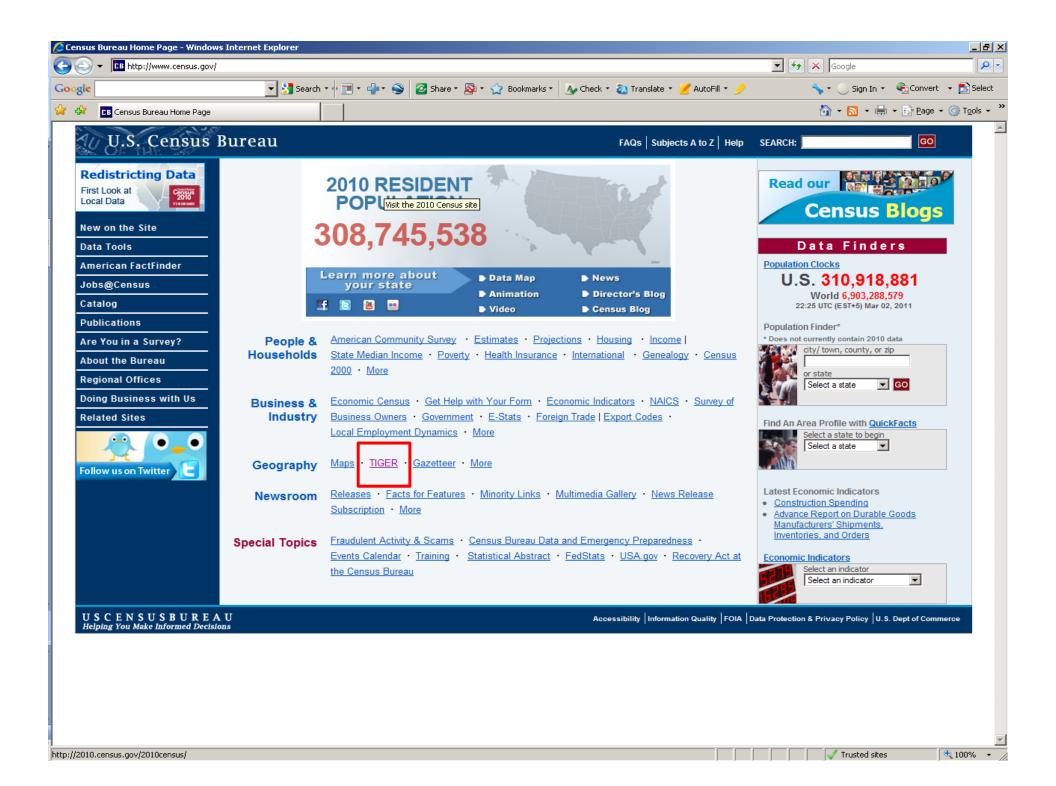
- TIGER/Line now released as shapefiles
- Plans for WFS/WMS access are in the works

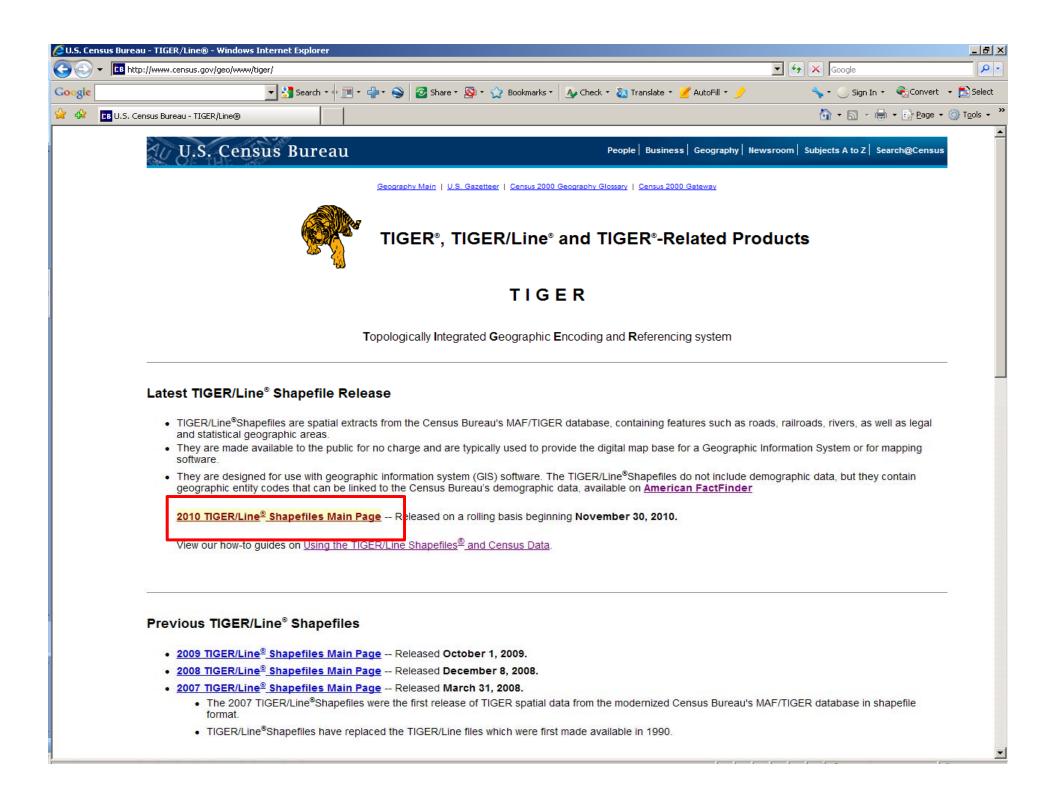


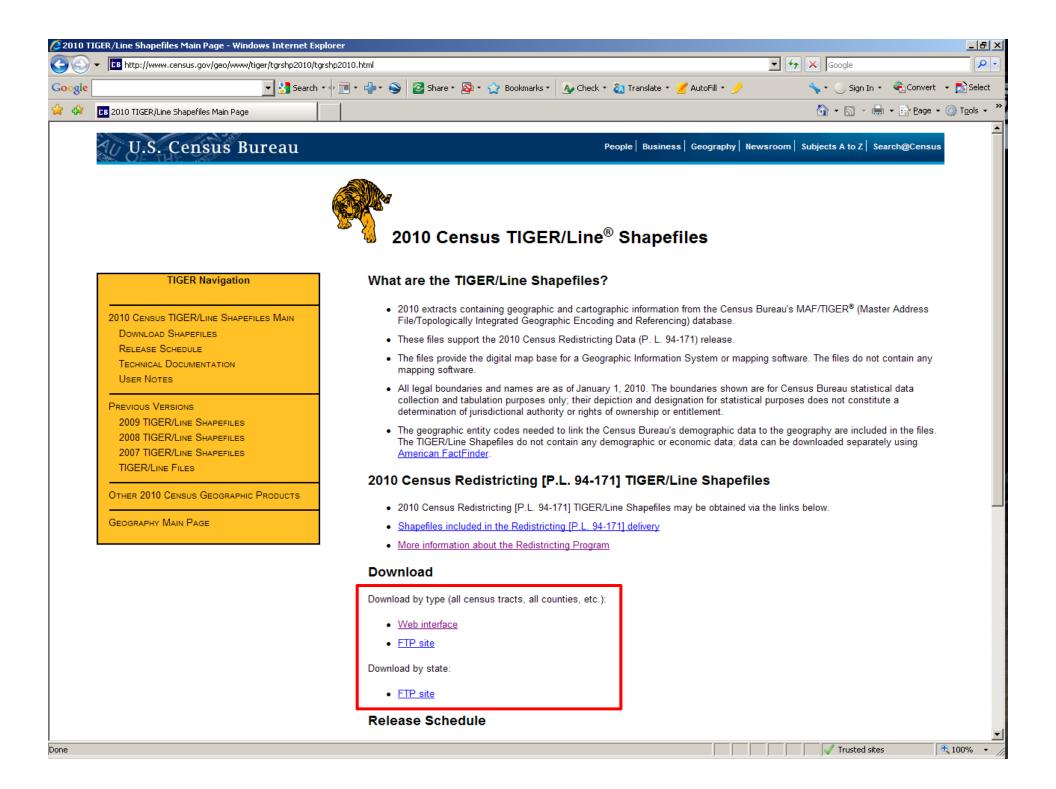
Cartographic Boundary Files

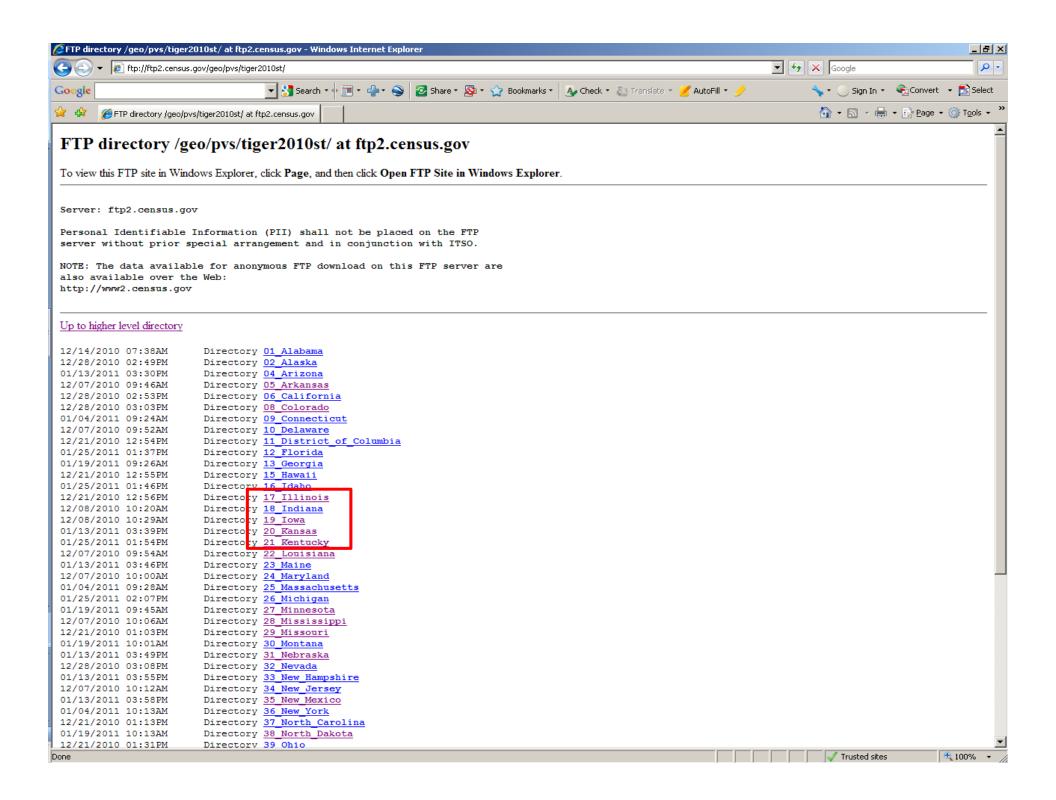
- State level files for selected geographies
- These are generalized files...
 - Line segments removed to simplify boundaries
 - Significantly reduces the size of the files
- CAUTION!! Don't mix county based TIGER/Line files with Cartographic Boundary files

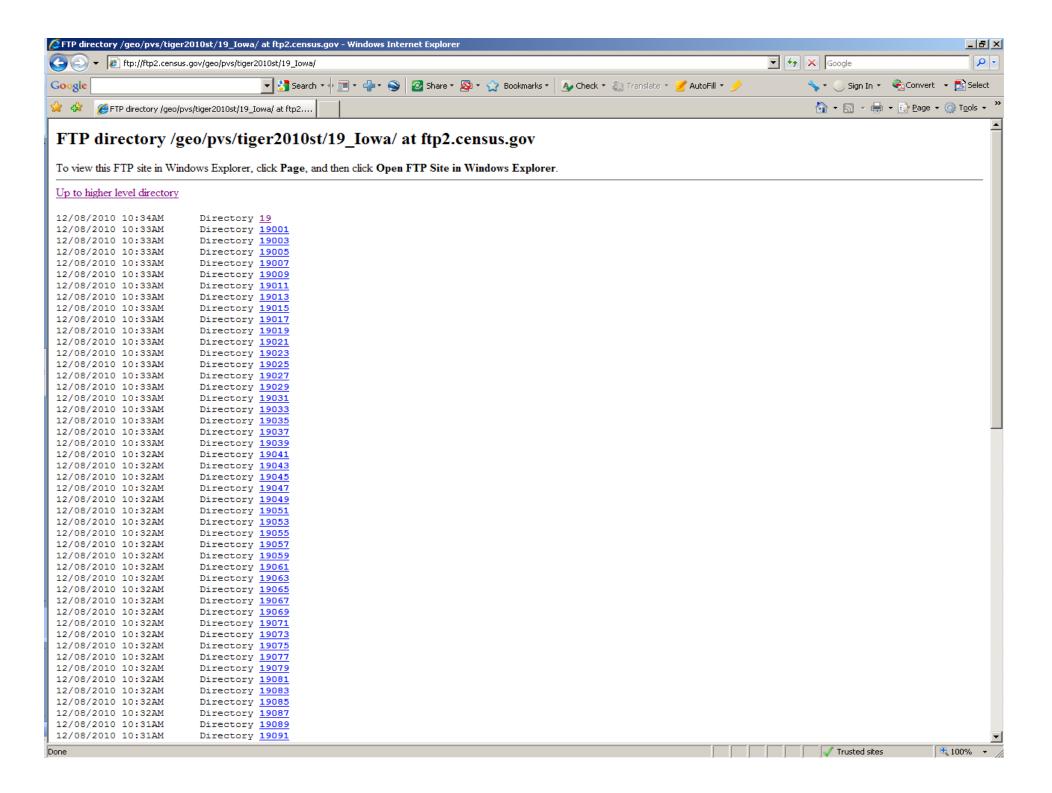


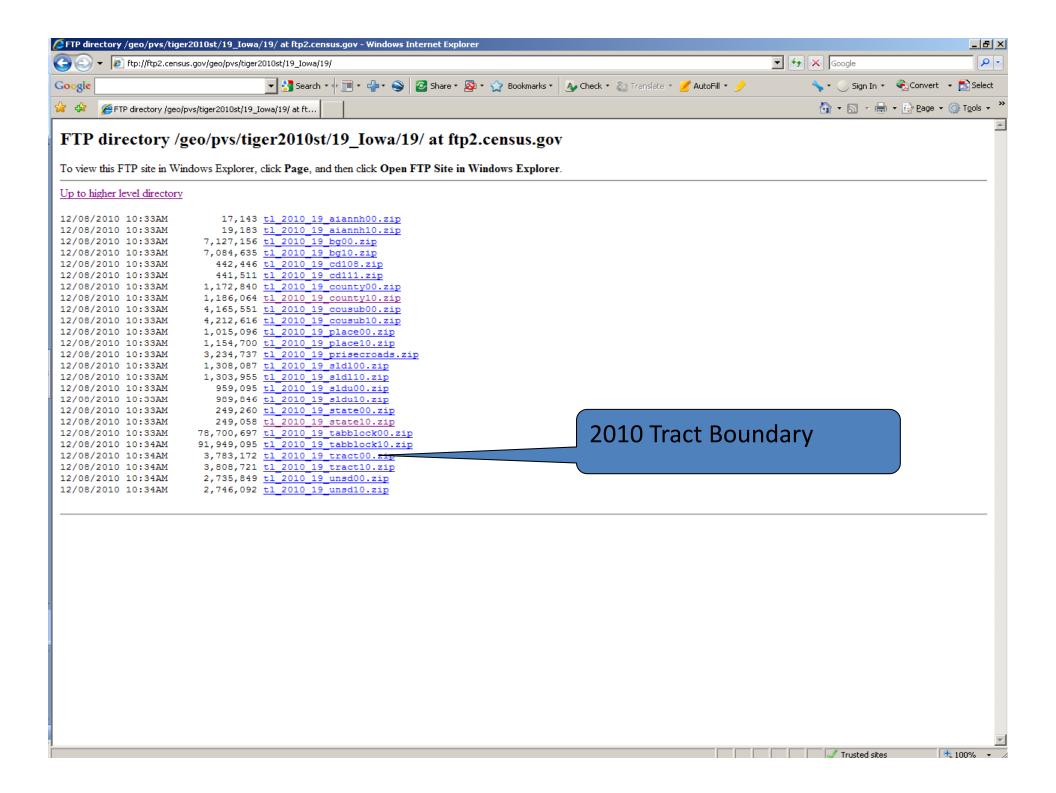


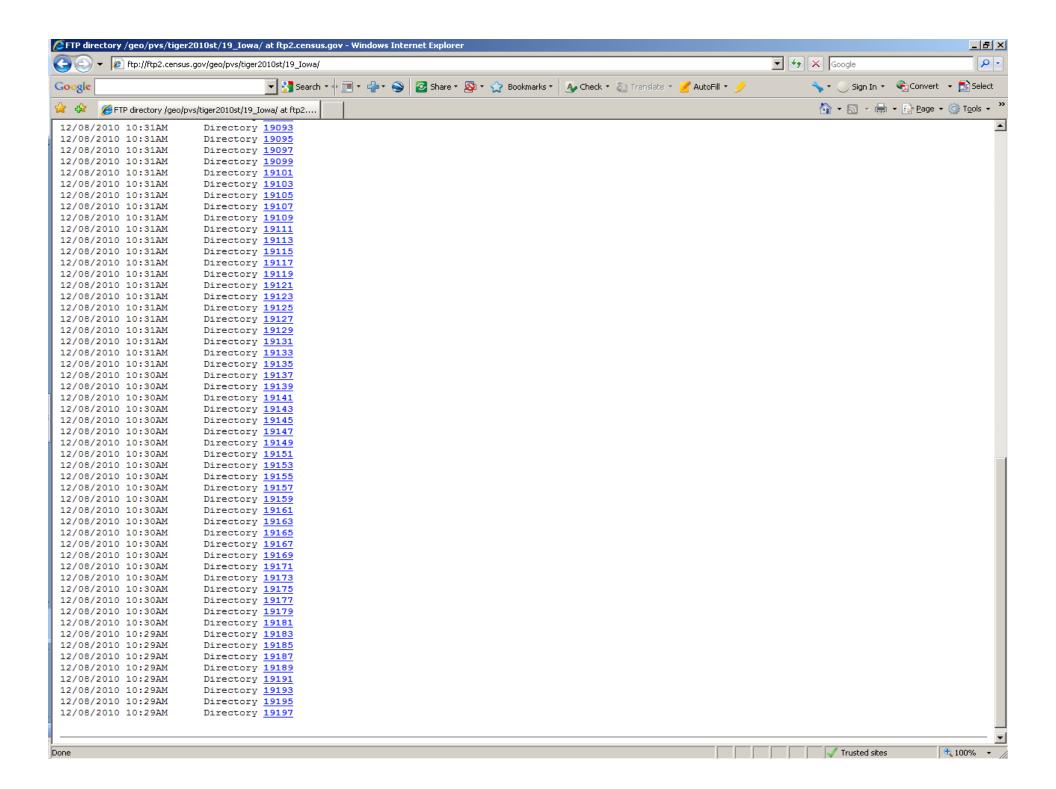


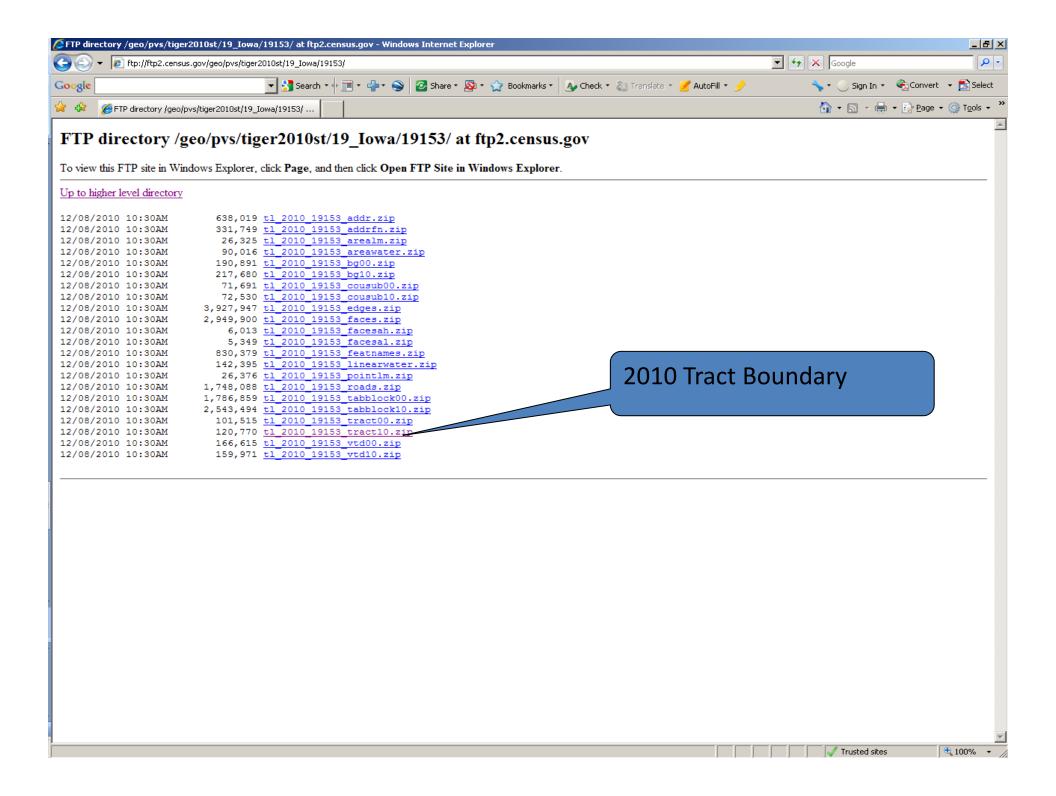


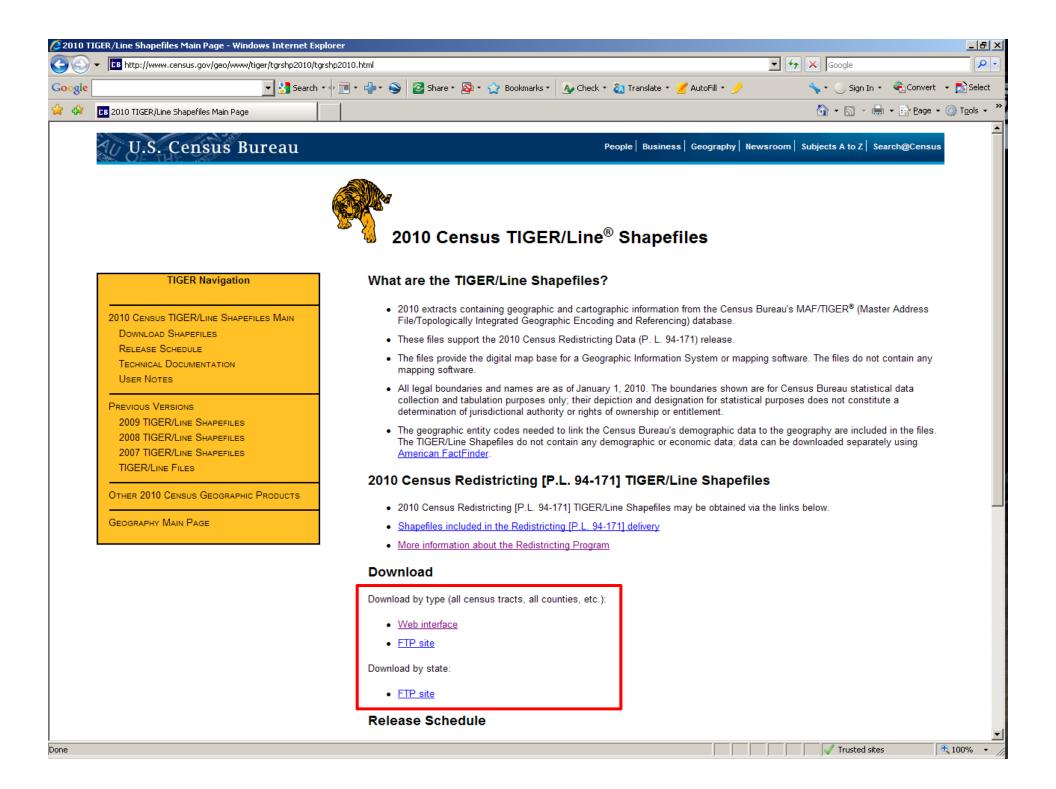


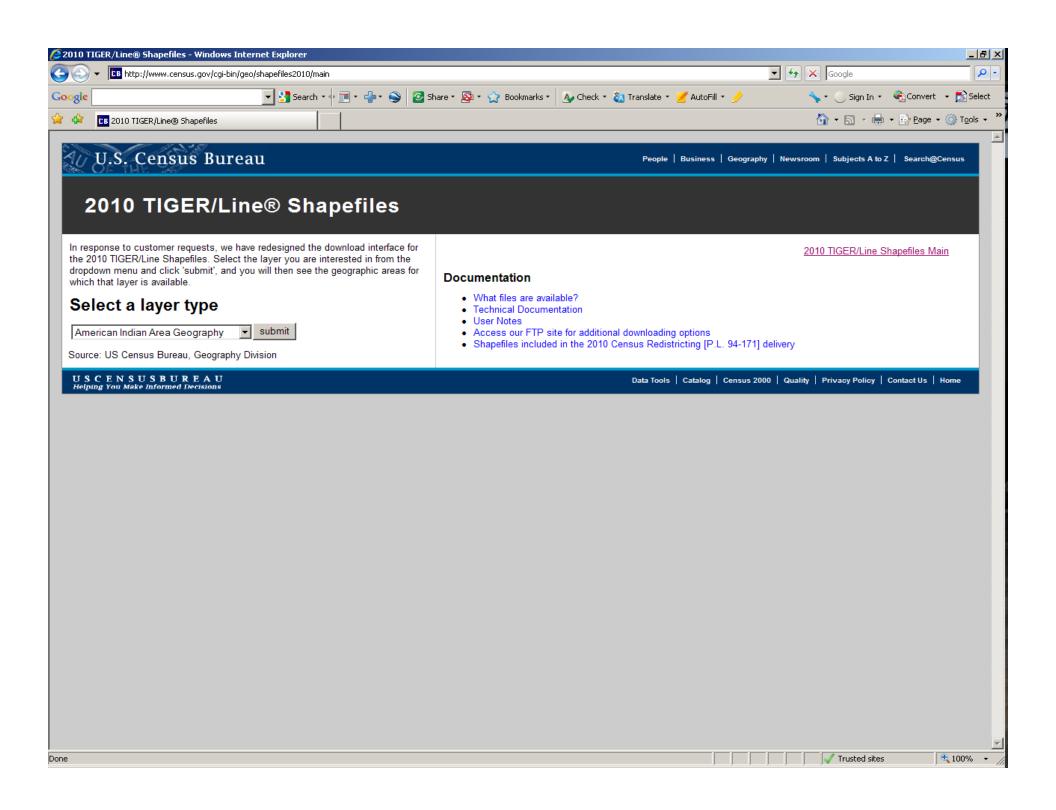


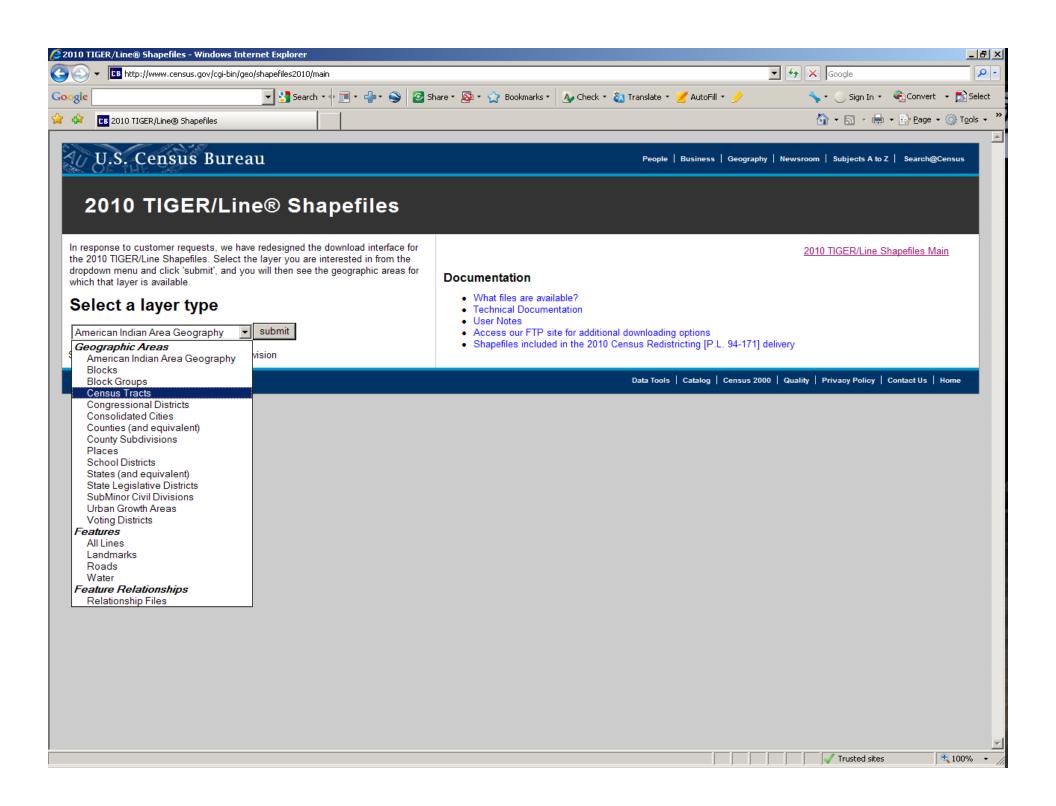


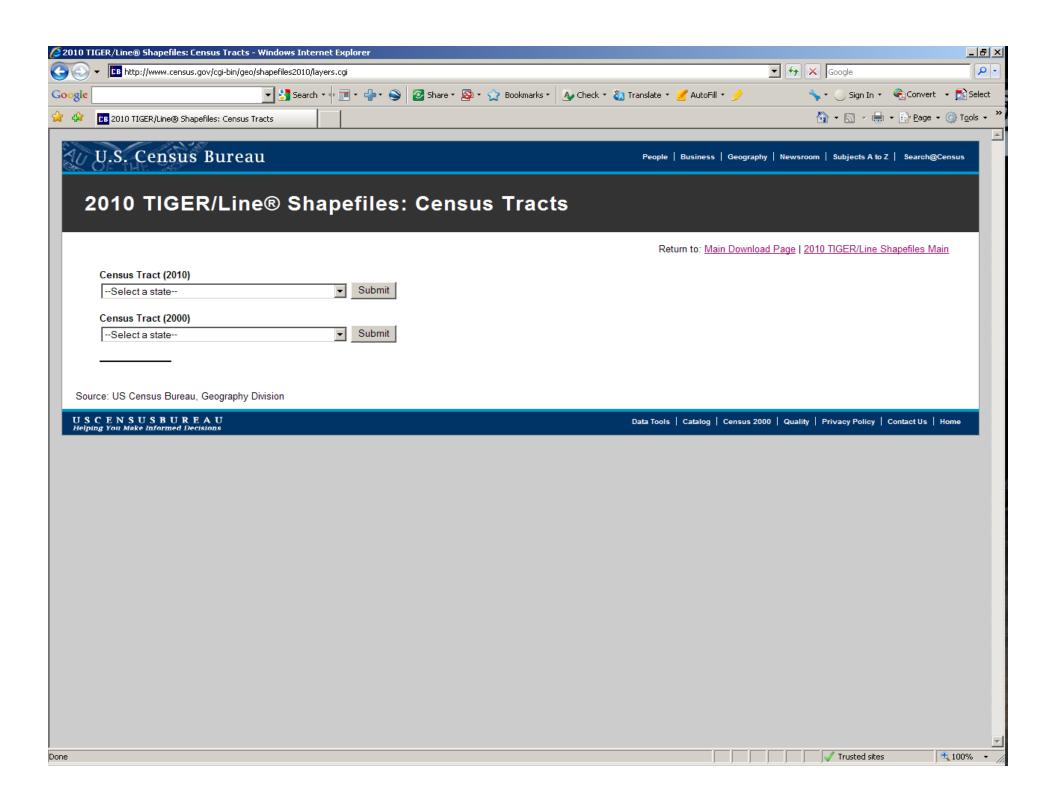


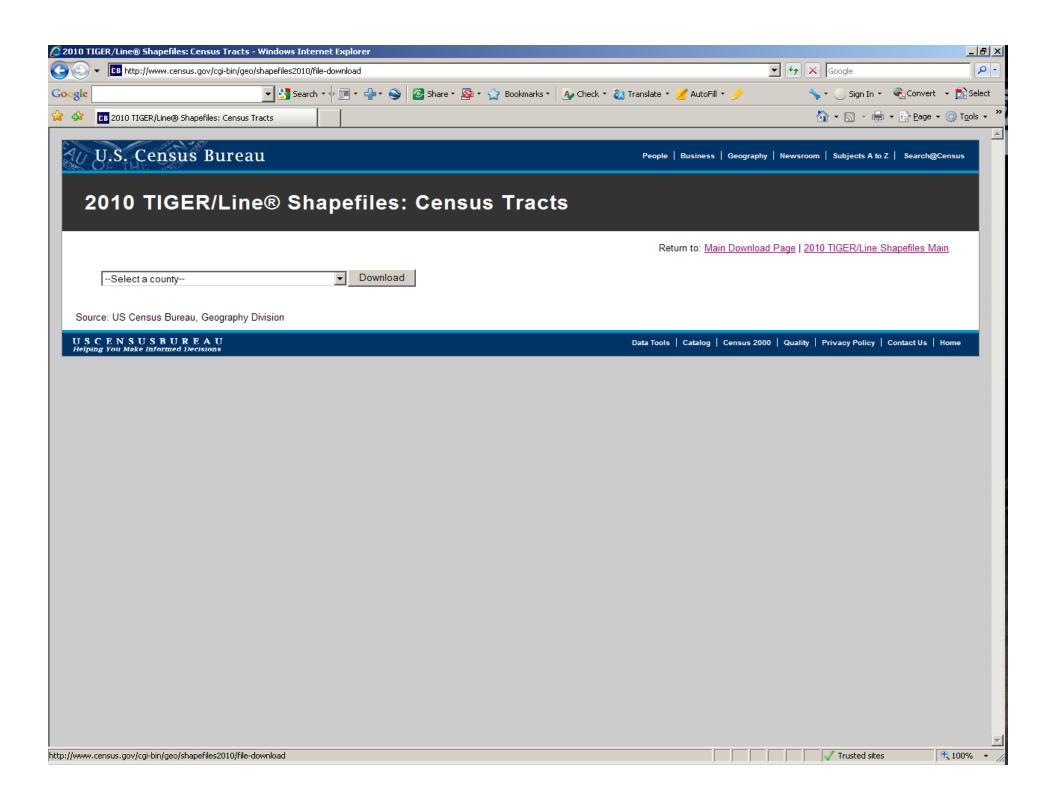


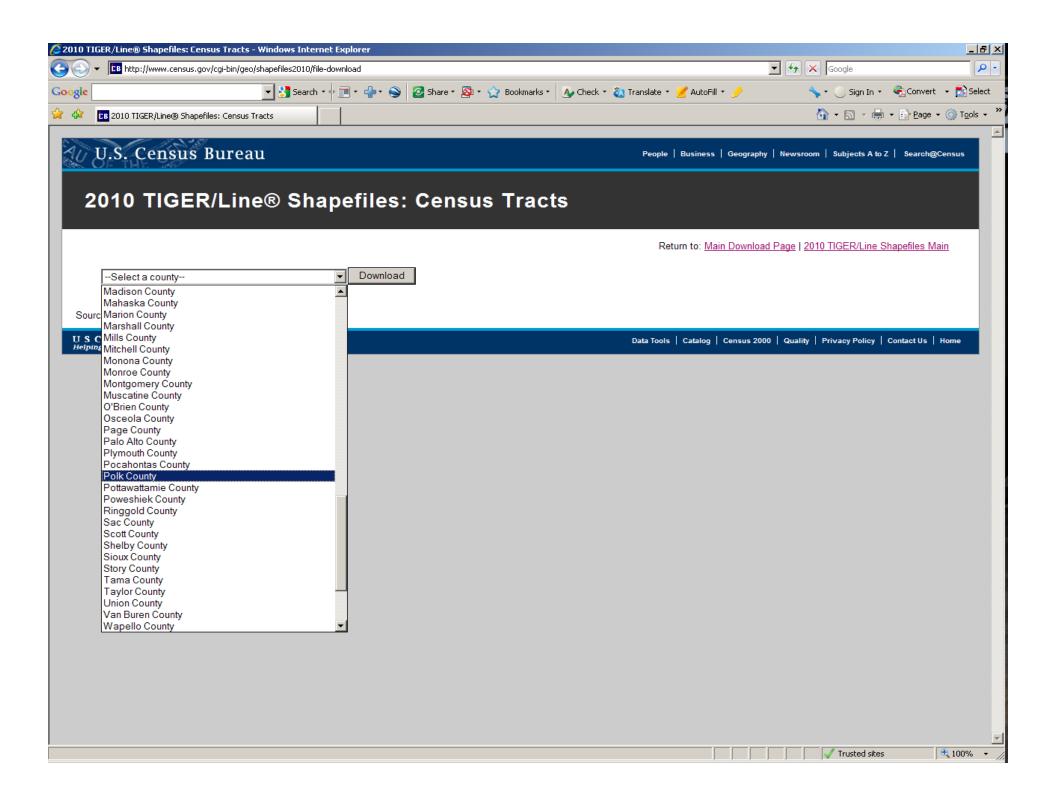












File Download

X

Do you want to open or save this file?



Name: tl_2010_19153_tract10.zip

Type: WinZip File, 117KB

From: www2.census.gov

<u>O</u>pen

Save

Cancel

Always ask before opening this type of file



While files from the Internet can be useful, some files can potentially harm your computer. If you do not trust the source, do not open or save this file. What's the risk?





American FactFinder



What is the American FactFinder?

- A Data Access Website
- Searches by
 - Topics
 - Geographies
 - Population Groups
 - Industry Codes



What is the American Factfinder?

- Provides quick access to data from
 - Decennial Census
 - American Community Survey
 - Population Estimates Program
 - Economic Census
 - Annual Economic Surveys



For now, there are 2 AFFs

- The most current version is called American Fact Finder 2 (AFF2)
- Legacy data is being transitioned into AFF2
- Upon completion, AFF will go off-line



How Do I Get to It?

- factfinder2.census.gov or
- www.census.gov, and click on the American FactFinder Link

American FactFinder



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Section 203, Voting Rights

On Wednesday, Oct. 12, the U.S. Census Bureau will release of a list of iurisdications that must provide language

See More





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Bureau

Data Finders

Population Clocks

U.S. 312,415,239

World 6,968,168,130 18:42 UTC (EST+5) Oct 13, 2011

2010 Population Finder



Select a state to begin Select a state

Find An Area Profile with QuickFacts



Select a state to begin Select a state

Latest Economic Indicators

- U.S. International Trade in Goods and Services
- Monthly Wholesale Trade: Sales and Inventories

Economic Indicators



Select an indicator

•

Select an indicator





ADVANCAC A

TENNESSEE CAROLINA
CAROLINA
SOLITH

The NEW American FactFinder is now available!

The transition from the legacy American FactFinder to the NEW American FactFinder will continue through the fall of 2011. Data on the legacy FactFinder will be moved to the NEW FactFinder in the coming months. Frequently Asked Questions »

The legacy American FactFinder will be discontinued in the fall of 2011.



for data from

Census 2010 and 2000 and the 2010 American Community Survey

factfinder2.census.gov

Learn more about the New American FactFinder

For information about the release of data from the 2010 Census, see the 2010 Census Data Products release schedule



for data from the

2000-2009 American Community Survey, the Economic Census, and Population Estimates

factfinder.census.gov

U.S. Census Bureau





OKEAHOMA

ARKANSAS J

TENNESSEE

NORTH

The NEW American FactFinder is here!

Learn more about the features and functions of the NEW American FactFinder.

- Download a brief informational brochure
- Take a Virtual Tour
- View tutorials of American FactFinder's features and functions:
 - ▶ Quick Start
 - ▶ Topic Search
 - Search using Geographies, Population Groups and Industry Codes
 - Working with Search Results
 - ▶ Create a Map
 - Modify a Table
 - Accessing the 2010 Census Redistricting Data (P.L. 94-171) Summary File
 - Transpose Rows and Columns
 - Bookmark and Download

A how-to guide for **Building Deep Links into the New American Factfinder** is now available. Please note that the current American FactFinder will be discontinued in the Fall of 2011. At that time, any deep links into the discontinued system will no longer work.

Subscribe to receive email updates about American FactFinder.







AN ANY AND A



Tutorials

Learn more about the features and functions of American FactFinder

Select a Tutorial:

Quick Start

Topic Search

Search using Geographies, Population Groups and Industry Codes

Working with Search Results

Create a Map

Modify a Table

Accessing the 2010 Census Redistricting Data (P.L. 94-171) Summary File

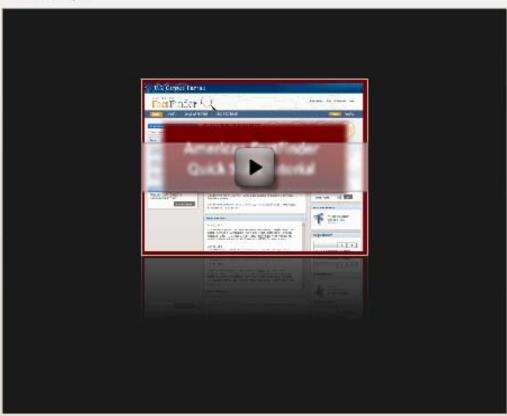
Transpose Rows and Columns

Bookmark and Download

Tutorial 1: Quick Start

You must have the Adobe Flash Player plug-in Installed to play this video.

Video transcript »



Video Transcript:

Welcome to the American FactFinder Quick Start Tutorial.

The NEW American FactFinder is now available!

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SEARCH WHAT WE PROVIDE USING FACTFINDER Español Your source for population, housing, Your Selections economic, and geographic data "Your Selections' is empty Topics 🔞 The full set of 2010 ACS products for all areas of 65,000 or more are now available in American **U.S. Population Clock** FactFinder. Geographies 18:54 UTC (EST+5) Oct 13, 2011 (states, counties, places,...) View video tutorials to help you get started using the NEW American FactFinder. 312,415,293 **Population Groups Quick Start** more population clocks (race,ancestry,...) Enter search term(s) and click 'GO' Reference Maps **Industry Codes** topic or table name geography (optional) (NAICS,...) for Reference Maps show selected geographic boundaries for an area along with orienting features, such as roads. Legacy American FactFinder United States Or use the options on the left to begin your search The following data are available on the legacy American FactFinder System: News and Notes GET EMAIL UPDATES Address Search 2007 Economic Census 2009 American Community Sep 27, 2011 Find Census data by entering a street 2009 Population Estimates The Census Bureau released new information on same-sex couples from the 2010 Census including the number of married couples and a set of preferred estimates of same-sex spouses and unmarried partners at the national and state levels. These estimates were developed to account for data capture errors that make it difficult to measure same-sex couple households. Estimates from the 2010 American Community Survey (ACS), along with **Load Query** Did you know? a brief analyzing the ACS estimates are available here more » Use Load Query to restore a previously saved query () Sep 27, 2011 LOAD QUERY The full set of 2010 ACS products for all areas of 65,000 or more are now available 1.233 is the number of locations http://factfinder2.census.gov/bkmk/navigation/1.0/en/d dataset:ACS 10 1YR producing chocolate and cocoa products in 2007 Sep 22, 2011 The Census Bureau released all of the 2010 ACS 1-year estimates on Thursday, September 22. Due to a

U.S. Census Bureau

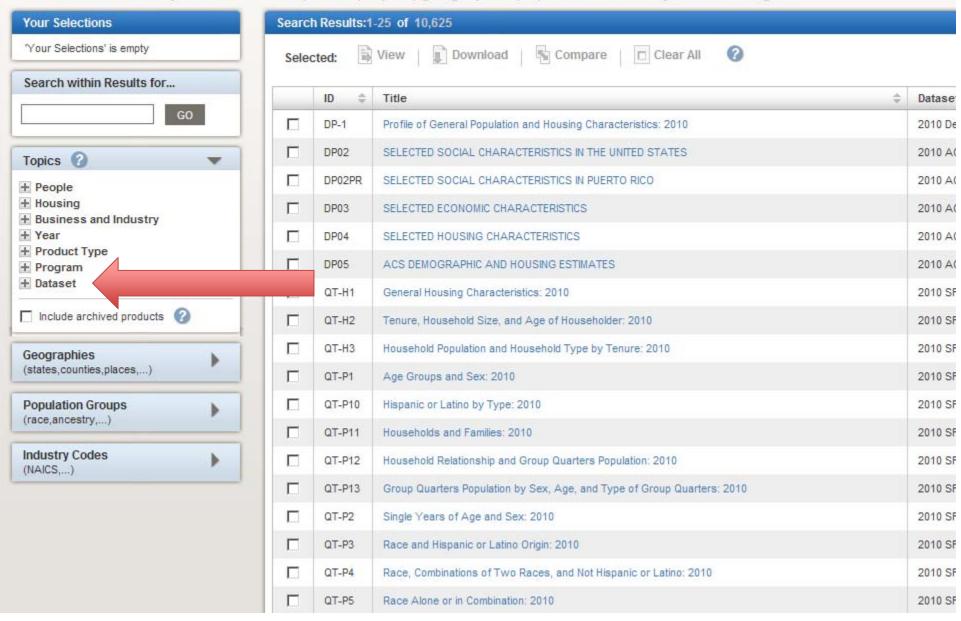
MAIN

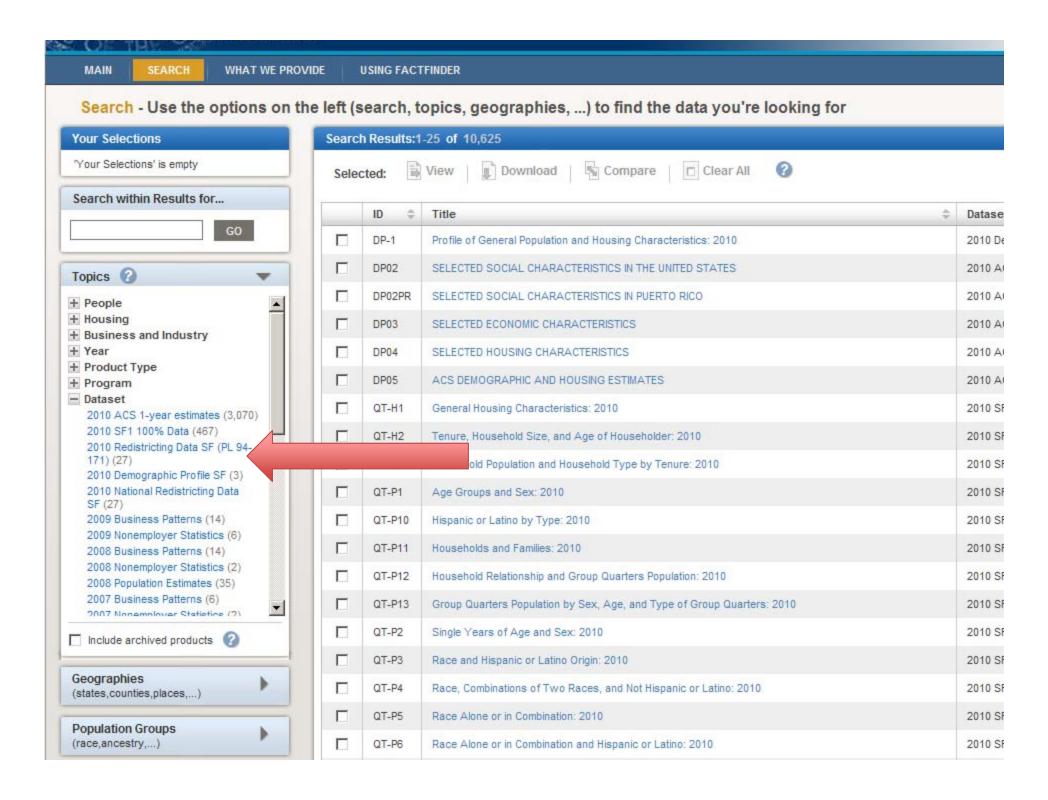
SEARCH

WHAT WE PROVIDE

USING FACTFINDER

Search - Use the options on the left (search, topics, geographies, ...) to find the data you're looking for





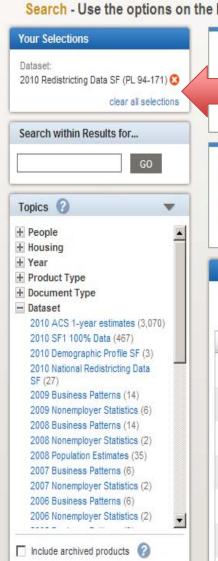
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WHAT WE PROVIDE

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Feedback FAQs Glossary Help

Search - Use the options on the left (search, topics, geographies, ...) to find the data you're looking for



Geographies (states, counties, places,...)

Donulation Groups



Currently, the 2010 Demographic Profile has been released for a limited

number of geographies. Additional geographies will be available for the

2010 Demographic Profile later this summer.



View the 2010 Census Summary File 1 for detailed data on age, sex, households, families, the population in group quarters, and housing units. Also included are counts for many race and Hispanic or Latino categories. Data will be released on a state-by-state basis. Alabama and Hawaii has now been released

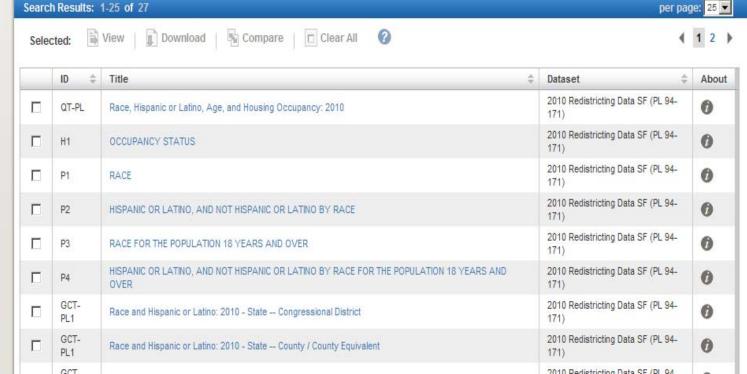
View Available Tables



All 2010 Census Products: Redistricting Data SF, National Redistricting SF, Demographic Profile SF, and Summary File 1 are available for the Census FTP site.



Census FTP site



U.S. Census Bureau MAIN SEARCH WHAT WE PROVIDE **USING FACTFINDER** Search - Use the options on the left (search, topics, geographies, ...) to find the data you're looking for **Your Selections** Note that 2010 Population Totals are included in most tables from the 2010 View the 2010 Census Su Redistricting Data. households, families, the p Dataset: Also included are counts f 2010 Redistricting Data SF (PL 94-171) (3) categories. Data will be rel clear all selections Hawaii has now been rele View Available Tables Search within Results for... GO Currently, the 2010 Demographic Profile has been released for a limited All 2010 Census Products: number of geographies. Additional geographies will be available for the Demographic Profile SF, ar 2010 Demographic Profile later this summer. FTP site. Topics (2) Census FTP site expand Geographies (states, counties, places,...) Search Results:1-25 of 27 Population Groups Clear All Compare Download Selected: (race,ancestry,...) **Industry Codes** ID Title Dat (NAICS,...) 201 QT-PL Race, Hispanic or Latino, Age, and Housing Occupancy: 2010 171 201 Г H1 OCCUPANCY STATUS 171 201 RACE 171 201 P2 HISPANIC OR LATINO, AND NOT HISPANIC OR LATINO BY RACE 171 201 П P3 RACE FOR THE POPULATION 18 YEARS AND OVER 171 201 HISPANIC OR LATINO, AND NOT HISPANIC OR LATINO BY RACE FOR THE POPULATION 18 YEARS AND P4 OVER 171

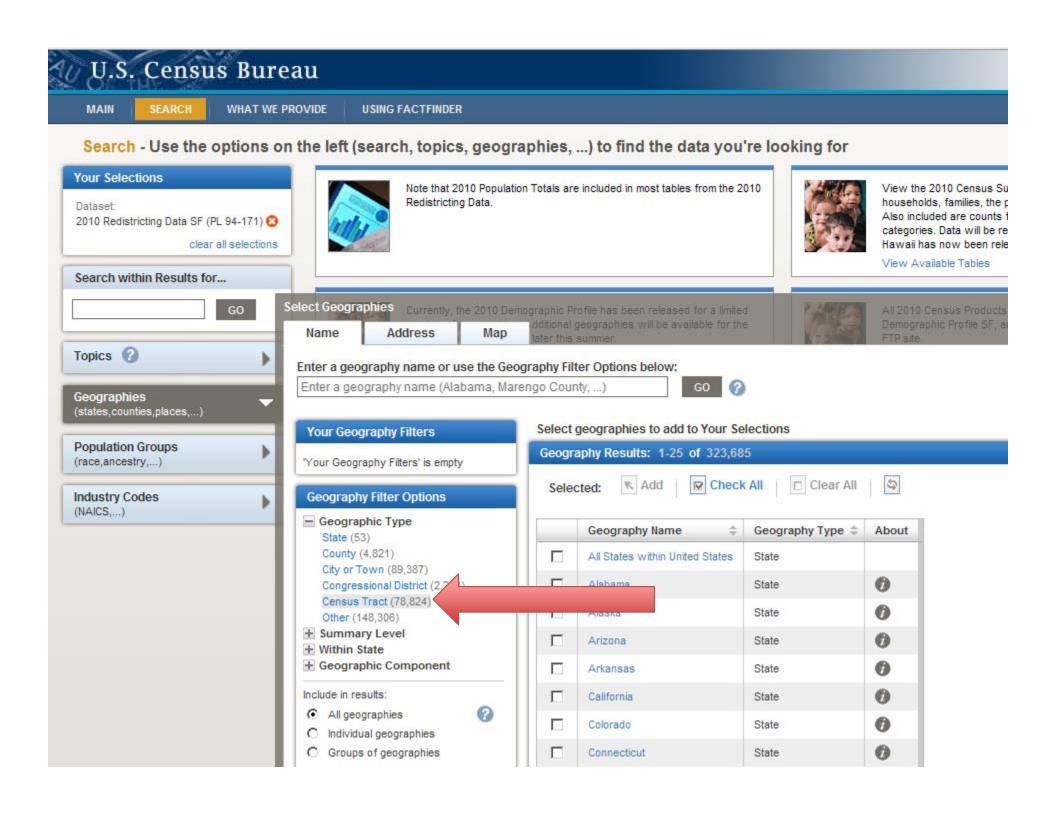
Race and Hispanic or Latino: 2010 - State -- Congressional District

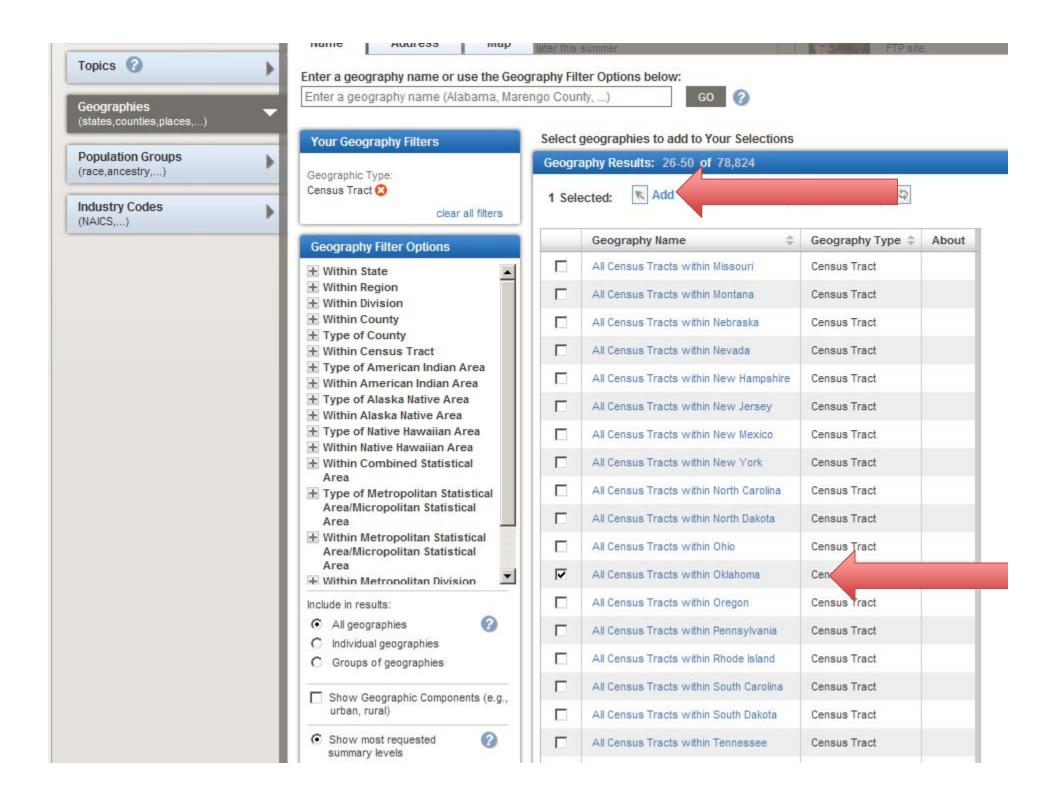
GCT-

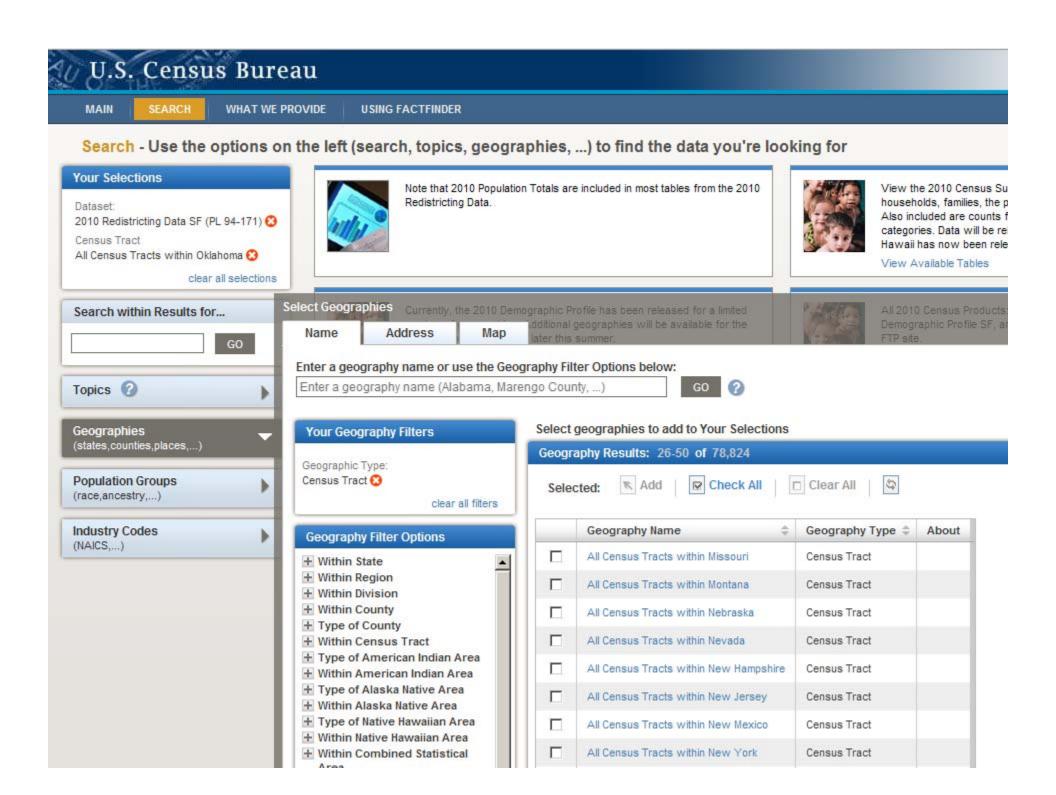
PL1

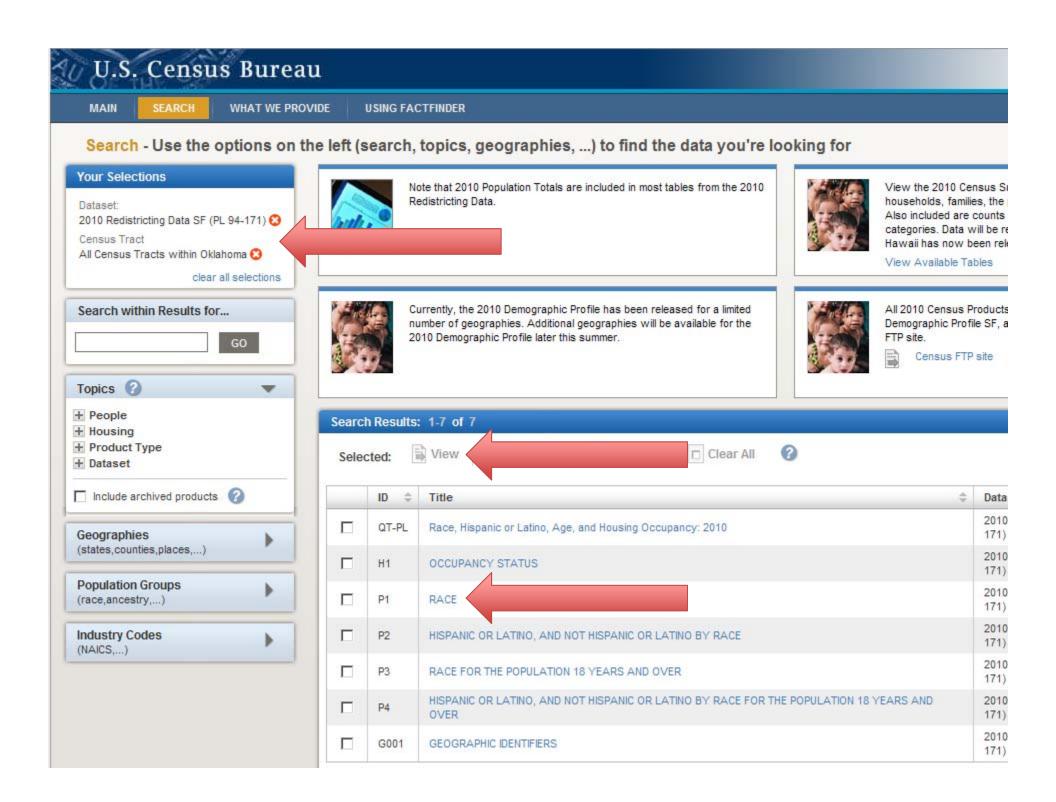
201

171









U.S. Census Bureau

MAIN

SEARCH

WHAT WE PROVIDE

USING FACTFINDER

Results - Click Back to Search to select other tables or geographies

◀ BACK TO SEARCH

P1

RACE

Universe: Total population

2010 Census Redistricting Data (Public Law 94-171) Summary File

Table View !!!

Map View 💚

Actions:

Modify Table



Bookmark | Print | Download



NOTE: For information on confidentiality protection, nonsampling error, and definitions, see http://www.census.gov/prod/cen2010/pl94-171.pdf

NOTE: Change to the California, Connecticut, Mississippi, New Hampshire, Virginia, and Washington P. L. 94-171 Summary Files as delivered.

<< 1 - 18 of 1 046 >>>

	Census Tract 3766, Adair County, Oklahoma	Census Tract 3767, Adair County, Oklahoma	Census Tract 3768, Adair County, Oklahoma	Census Tract 3769, Adair County, Oklahoma	Census Tract 3770, Adair County, Oklahoma	Census Tract 9556, Alfalfa County, Oklahoma	Census Tract 9557, Alfalfa County, Oklahoma	Census Tract 9560, Alfalfa County, Oklahoma	Census Tract 5876, Atoka County, Oklahoma	Census Tract 5877, Atoka County, Oklahoma	Census Tract 5878, Atoka County, Oklahoma	Census Tract 5879, Atoka County, Oklahoma	Census Tract 9516, Beaver County, Oklahoma
Total:	2,843	5,354	4,845	4,535	5,106	1,469	1,338	2,835	1,449	4,082	3,774	4,877	2,698
Population of one race:	2,554	4,702	4,270	4,081	4,691	1,434	1,316	2,772	1,336	3,717	3,557	4,563	2,593
White alone	1,770	2,927	1,684	1,551	1,825	1,374	1,269	2,399	1,047	2,833	3,029	3,551	2,099
Black or African American alone	2	22	8	13	10	7	8	214	29	267	7	226	30



Select a download format and click OK.



Database-compatible formats (data rows only)

Comma delimited (.csv) (.csv is compatible with spreadsheet programs such as Microsoft Excel)



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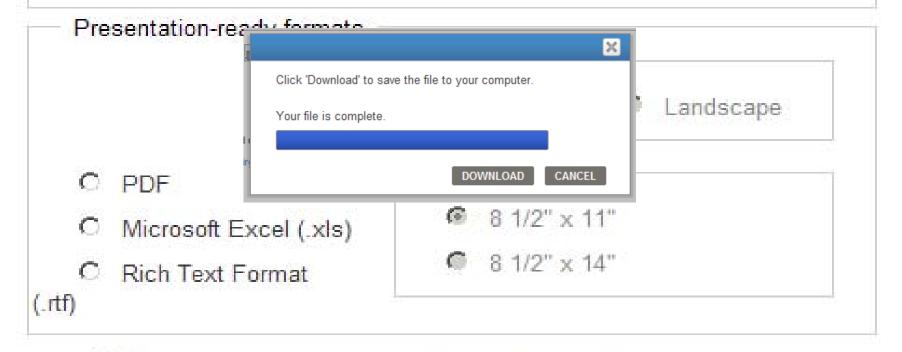




Select a download format and click OK.

Database-compatible formats (data rows only)

Comma delimited (.csv)
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Name: DEC_10_PL_P1.zip

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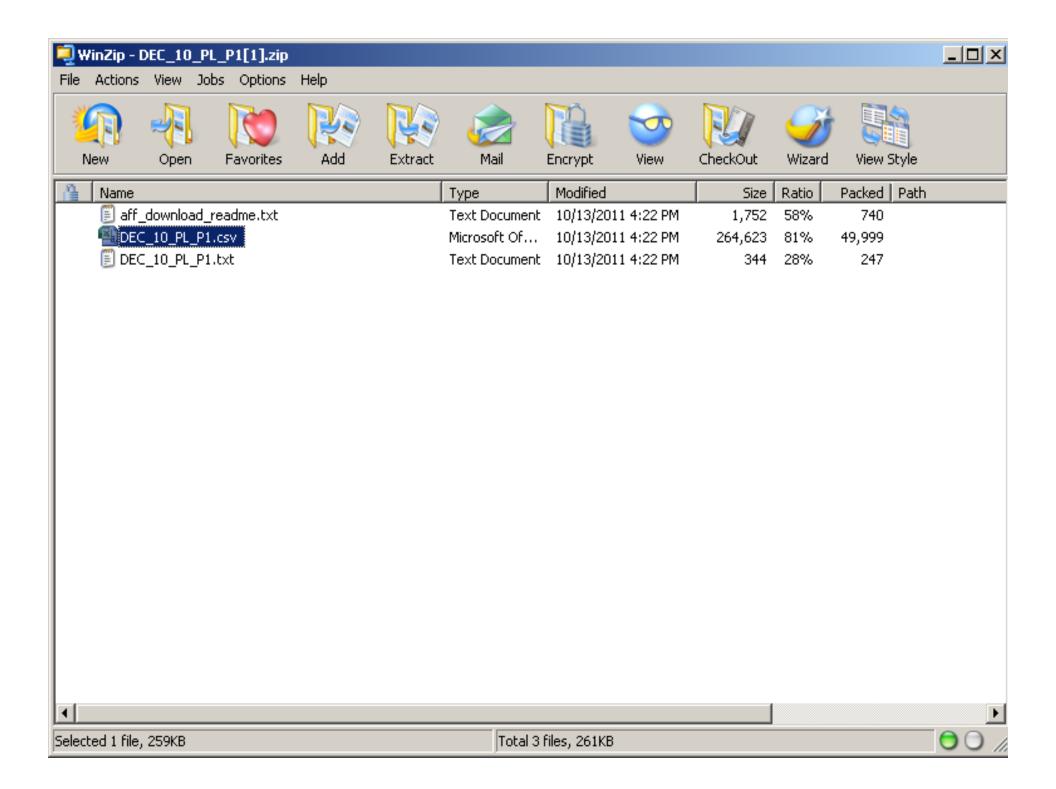
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4	А	В	С	D	Е	F	G	Н	1	J	K	L	M
L				D001	D002	D003	D004	D005	D006	D007	D008	D009	D010
2				Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:	Total:
3					Populatio	Populatio	Populatio	Populatio	Populatio	Populatio	Populatio	Two or Mo	Two or Mo
1	GEO.id	GEO.id2	GEO.displa	ay-label		White alo	Black or A	American	Asian alor	Native Ha	Some Oth	er Race ald	Populatio
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5	1400000US40001376600	40001376600	Census Tra	2843	2554	1770	2	749	11	0	22	289	280
7	1400000US40001376700	40001376700	Census Tra	5354	4702	2927	22	1593	96	0	64	652	643
3	1400000US40001376800	40001376800	Census Tra	4845	4270	1684	8	2487	1	1	89	575	554
9	1400000US40001376900	40001376900	Census Tra	4535	4081	1551	13	2216	19	0	282	454	444
0	1400000US40001377000	40001377000	Census Tra	5106	4691	1825	10	2778	3	0	75	415	409
1	1400000US40003955600	40003955600	Census Tra	1469	1434	1374	7	23	2	0	28	35	33
2	1400000US40003955700	40003955700	Census Tra	1338	1316	1269	8	29	3	0	7	22	16
.3	1400000US40003956000	40003956000	Census Tra	2835	2772	2399	214	110	9	0	40	63	62
4	1400000US40005587600	40005587600	Census Tra	1449	1336	1047	29	252	1	1	6	113	109
.5	1400000US40005587700	40005587700	Census Tra	4082	3717	2833	267	522	41	6	48	365	332
6	1400000US40005587800	40005587800	Census Tra	3774	3557	3029	7	479	10	0	32	217	215
7	1400000US40005587900	40005587900	Census Tra	4877	4563	3551	226	711	3	0	72	314	300
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9	1400000US40011959000	40011959000	Census Tra	1937	1866	1498	15	271	2	0	80	71	63

◆ ► ► DEC_10_PL_P1

leady





Alright, now what?

- The data are now in a "spreadsheet" format
- We need a "database" format
- Changes are necessary to make the data "GIS Ready"



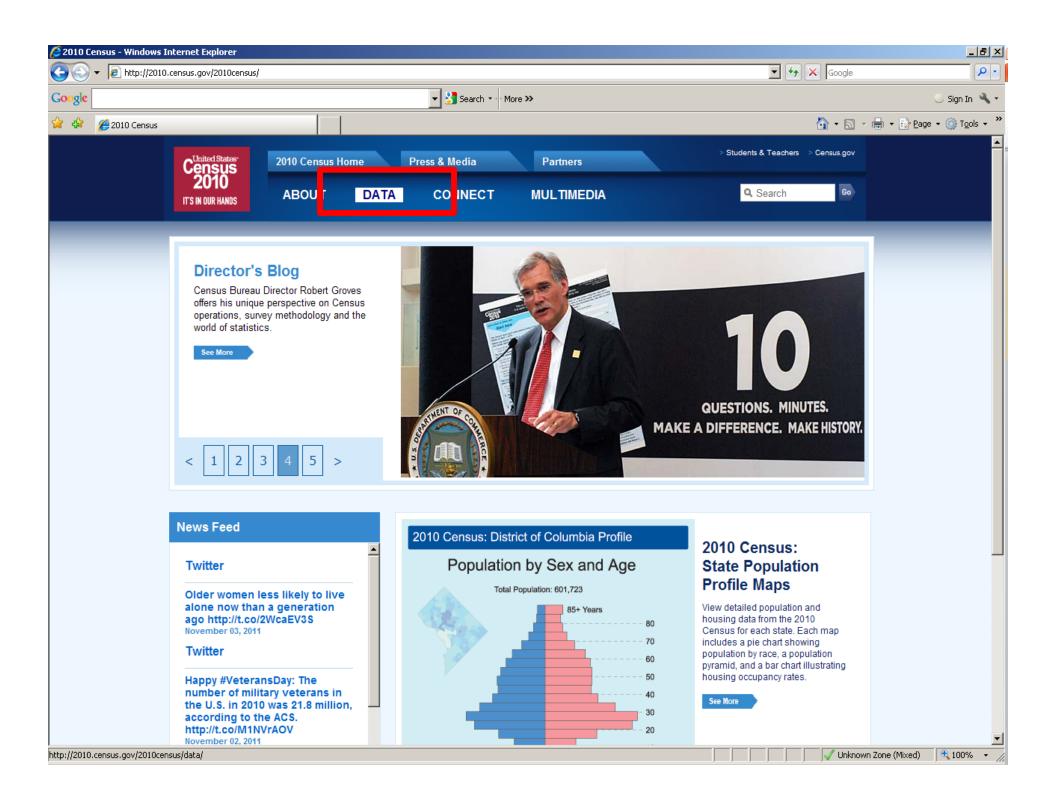
Making the Data "GIS Ready"

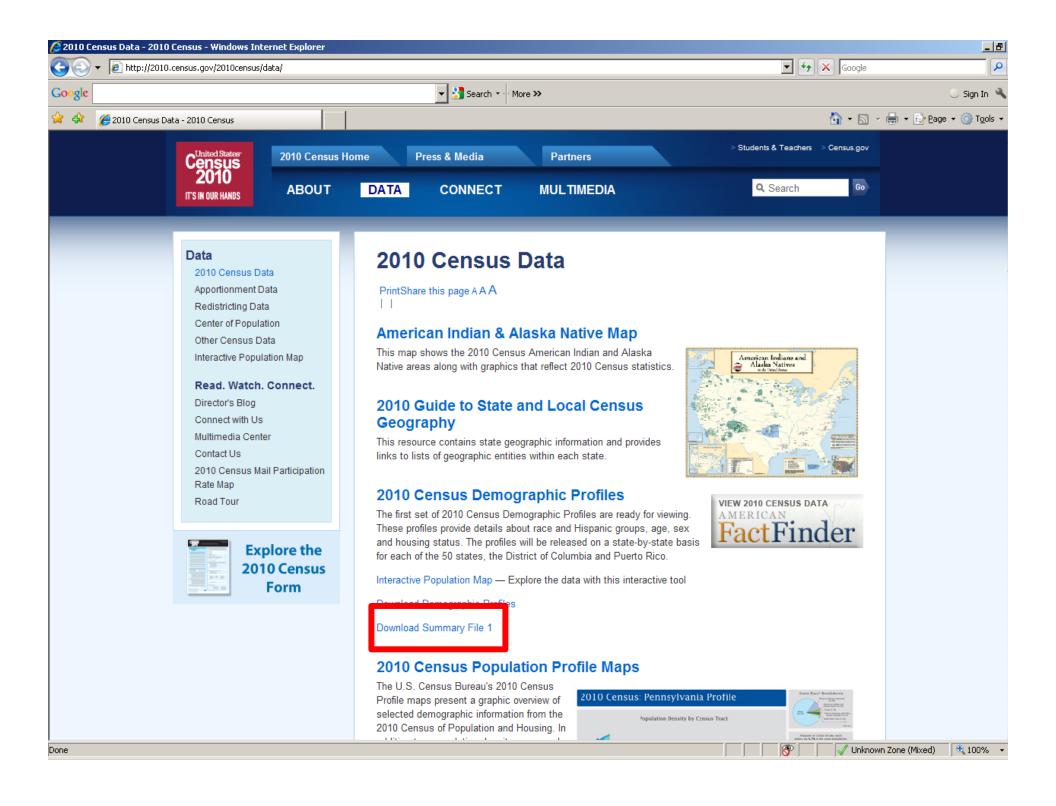
- Save a copy of data in a spreadsheet format
 - Retain column header/description
- 2. Ensure only 1 unique column header
- 3. Ensure GEOID field is accurate

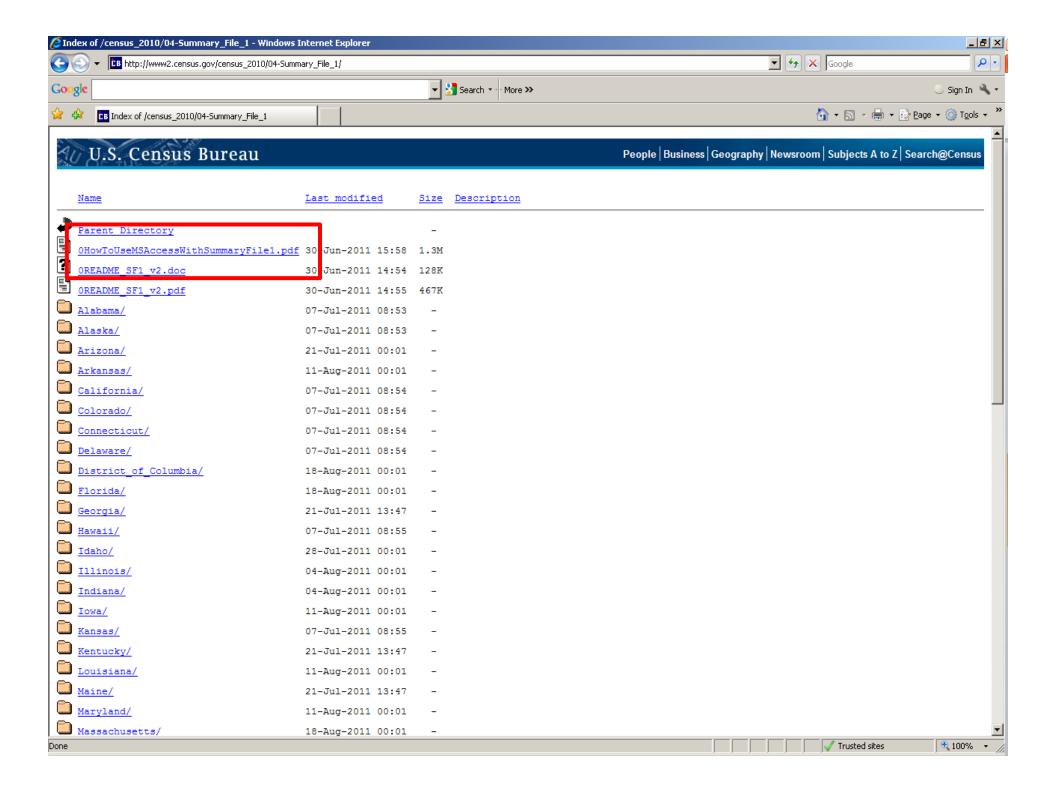


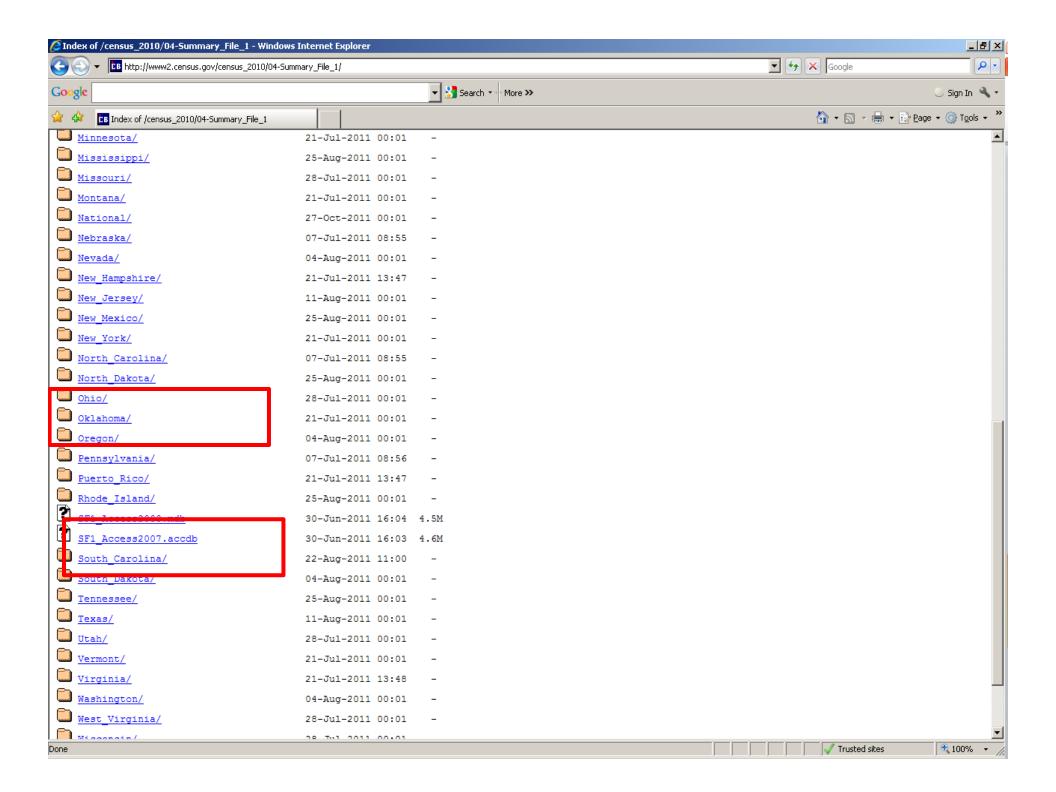
SF1 Data

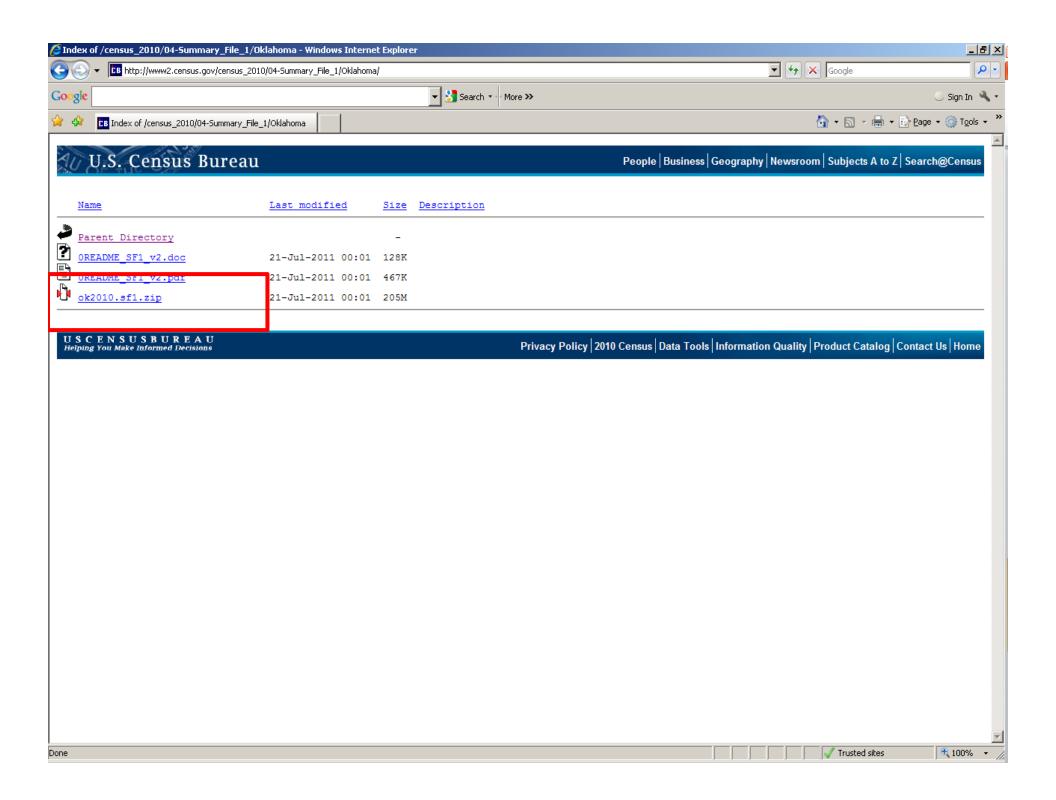


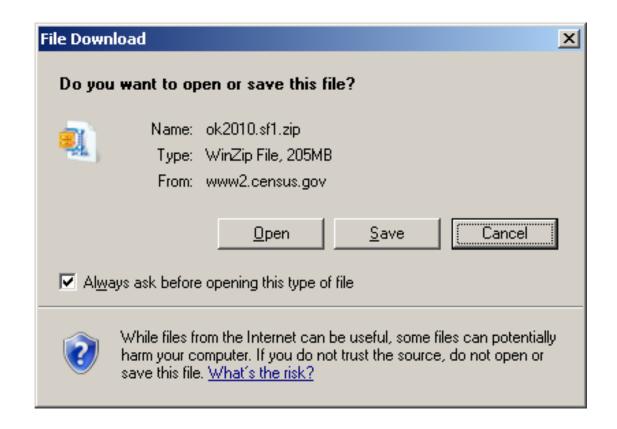






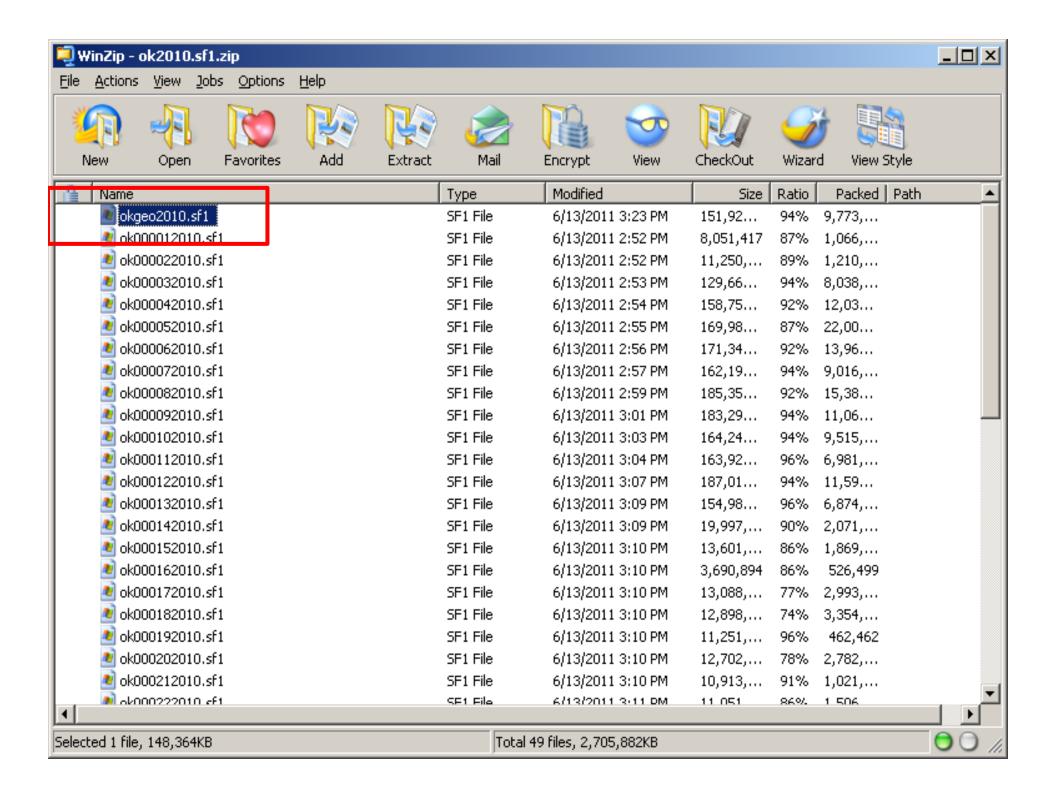


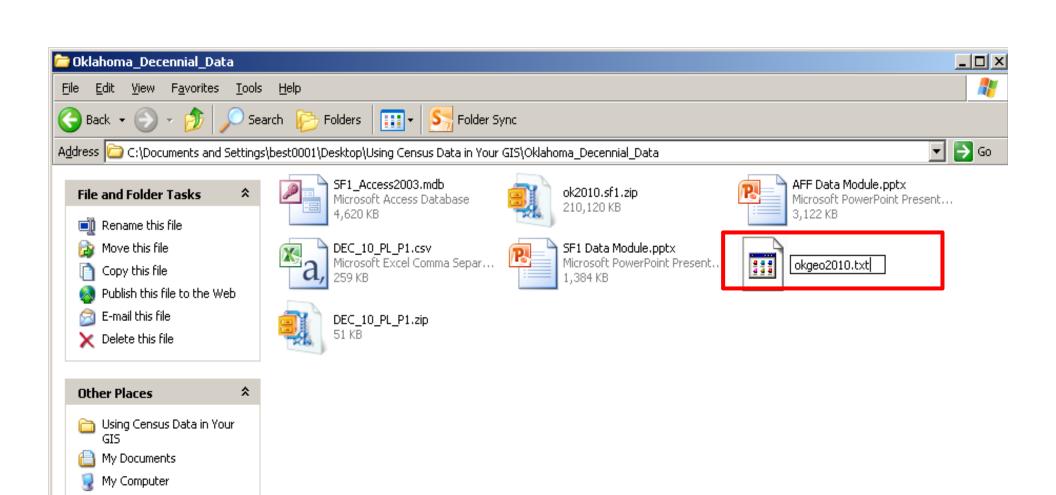






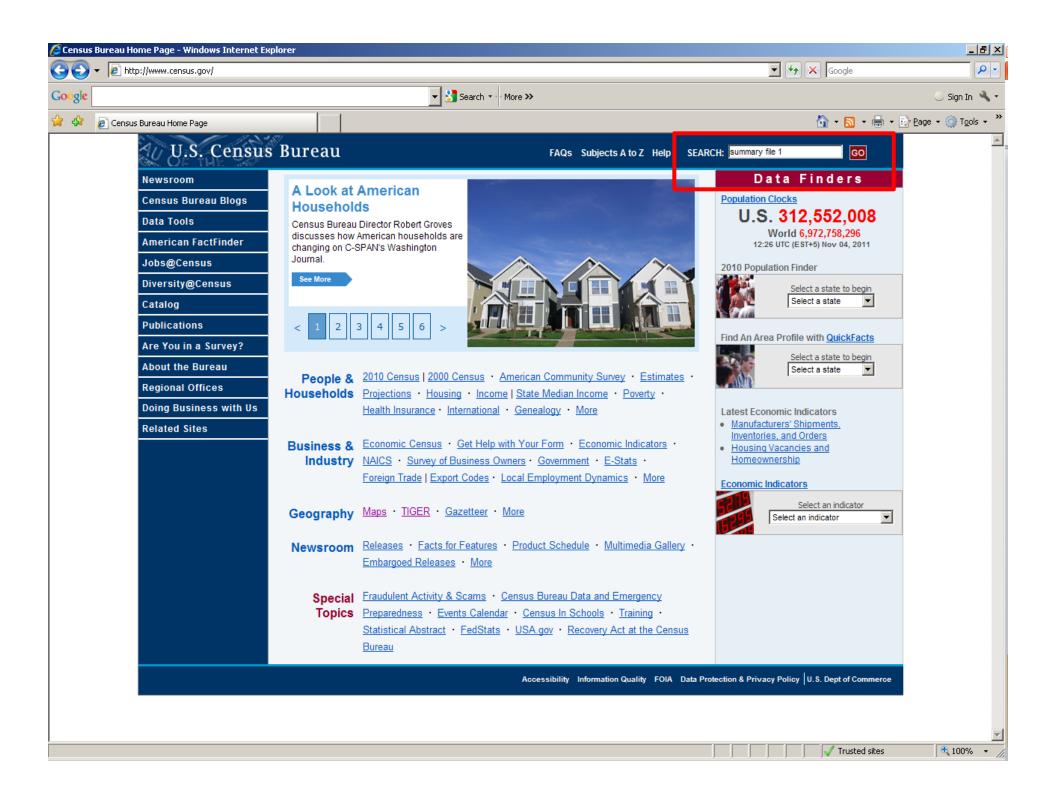


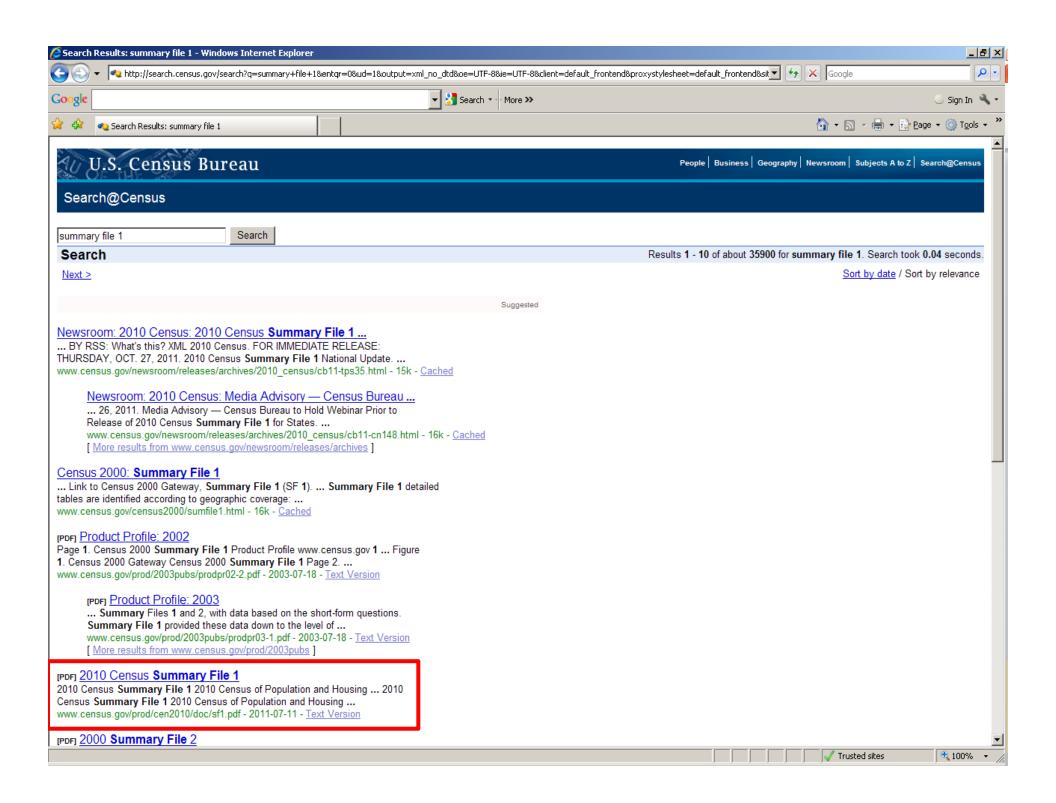


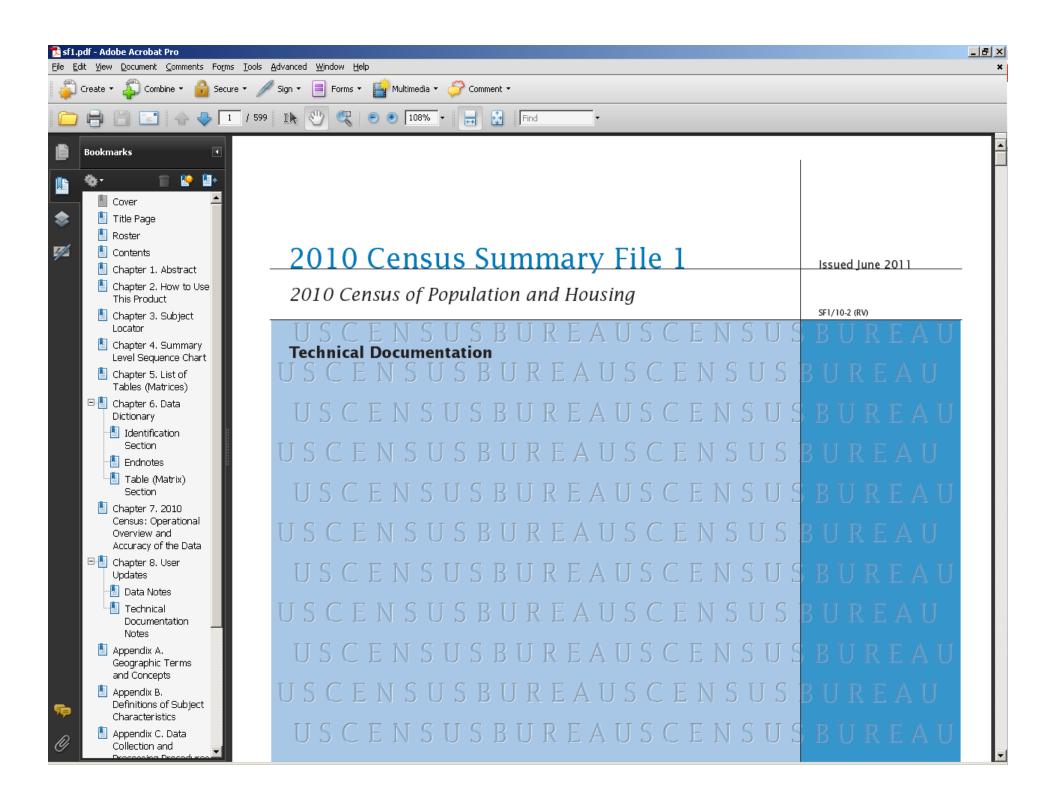


My Network Places

Details







Mapping the Data



Mapping the Data

- Remember, GEOID is the Key!!
- Open the Shapefile and join to the Access Table



Geographic Contact Information

Craig Best

Supervisory Geographer

US Census Bureau

1211 N 8th St, Kansas City, KS 66101

913-551-6833

craig.duane.best@census.gov

