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Using the Census Web Site

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Using the Census Web Site

Ellen K. Cromley
University of Connecticut
Center for Geographic Information and Analysis

November 7, 2007 – Homer Babbidge Library

The Census Geographic Data Initiative is a project of the University of Connecticut Center for Geographic Information and Analysis. The UCCGIA was founded in 1997 with support from the Homer Babbidge Library, the Department of Geography, and the College of Liberal Arts and Sciences. The mission of the Center is to advance the use of geographic data and spatial analytic techniques in research, teaching, and service at the University of Connecticut and in the region it serves.

Robert Cromley is the Director of the Center.

As a Center affiliate, I welcome you to the second in a series of four workshops sponsored by the Initiative.

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Purpose of the Initiative

- To increase understanding and use of U.S. Census geographic data
- To design and create a geographic database of Connecticut census geography (1790 to 2000)
- To develop search and discovery tools using this database

The purpose of the UCCGIA's Census Geographic Data Initiative is threefold:

First, we want to increase understanding and use of U.S. Census **geographic** data in the University community and in the state.

Second, we are in the process of designing and creating a digital geographic database of Connecticut census geography for each decennial census from 1790 to 2000.

Third, we are working with colleagues in the Library's Information Technology section to develop search and discovery tools that will use this database to find information.

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Four Workshops

- Geography of the 2000 Census
- Using the Census Web Site
- Census Geography Items in the Homer Babbidge Collection
- Census Enumeration Districts

Today's workshop focuses on using the Census Web site. The remaining workshops this year will cover census geography items in the Homer Babbidge Collection and census enumeration districts.

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Workshop Materials On-line

- Workshop Presentations and Handouts in .pdf format
- Center's Digital Commons site http://digitalcommons.uconn.edu/uccgia/

  Click on link to UCCGIA Census Geographic Data Initiative

Copies of all workshop presentations and handouts are available after the workshop presentation at the Library's Digital Commons site under the Center for Geographic Information and Analysis and MAGIC user community listing in the UCCGIA Connecticut Census Geographic Data Initiative series.

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Purpose of this Presentation

- Overview of key Census geography content on Census Web site
- Geography Section
  Maps—TIGER—Gazetteer—More
- Geography search in American FactFinder
- Downloading Census data

The purpose of this presentation is to provide an overview of key Census geography content the Census Web site.

We will be looking at the Census web site Geography section which has four main components:

Maps

TIGER

Gazetteer

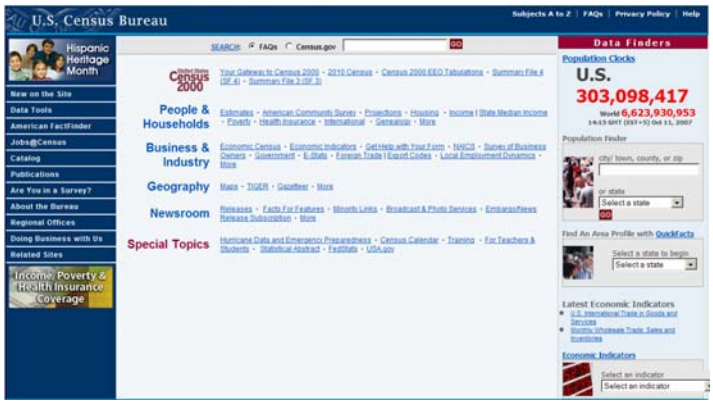
And More

We will also be looking at the Geography search capabilities in American FactFinder.

The presentation will review downloading Census maps and geographic data.

Census Web Site

- http://www.census.gov

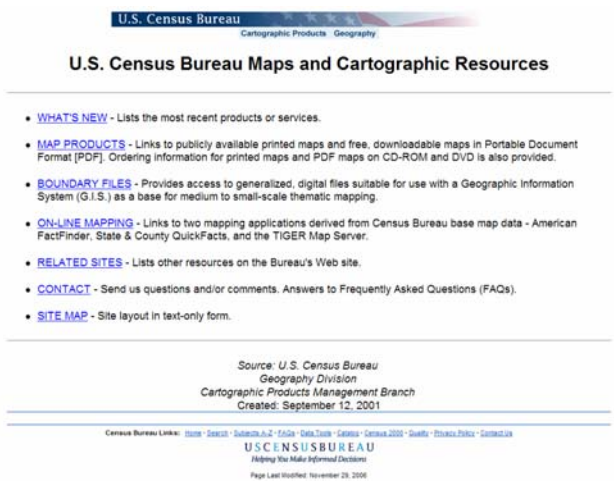


The Geography link is one of the main links on the home page.

Clicking on the Geography link takes the user to a central page that contains links to many pages that can be also be reached through the components listed next to Geography.

Census Geographic Data Initiative

Maps



U.S. Census Bureau

Cartographic Products Geography

U.S. Census Bureau Maps and Cartographic Resources

- WHAT'S NEW - Lists the most recent products or services.
- MAP PRODUCTS - Links to publicly available printed maps and free, downloadable maps in Portable Document Format [PDF]. Ordering information for printed maps and PDF maps on CD-ROM and DVD is also provided.
- BOUNDARY FILES - Provides access to generalized, digital files suitable for use with a Geographic Information System (G.I.S.) as a base for medium to small-scale thematic mapping.
- ON-LINE MAPPING - Links to two mapping applications derived from Census Bureau base map data - American FactFinder, State & County QuickFacts, and the TIGER Map Server.
- RELATED SITES - Lists other resources on the Bureau's Web site.
- CONTACT - Send us questions and/or comments. Answers to Frequently Asked Questions (FAQs).
- SITE MAP - Site layout in text-only form.

Source: U.S. Census Bureau
Geography Division
Cartographic Products Management Branch
Created: September 12, 2001

Census Bureau Links: Home · Search · Subjects A-Z · FAQs · Data Tools · Catalog · Census 2000 · Quality · Privacy Policy · Contact Us

USCENSUSBUREAU

Helping You Make Informed Decisions

Page Last Modified: November 29, 2006

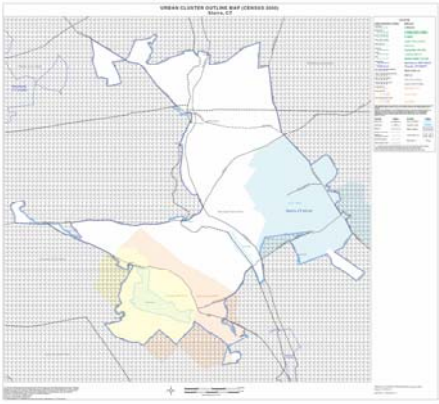
Clicking on the Maps link brings the user to a site for accessing U.S. Census Bureau Maps and Cartographic Resources.

The Census publishes a wide range of maps in .pdf format that can be downloaded from the site. The most recent products are listed under the What's New link. Others are listed under the Map Products link. Printed maps stored in digital format can also be ordered on CD-Rom or DVD.

Census Geographic Data Initiative

- **WHAT'S NEW⇒**
  Urban Cluster (UC) Outline Maps, wall-sized (January 2003) [PDF]
  Description | 2000 ⇒
  Maps: 1 UC: 85141 Storrs, CT

- **Handout Example**



This map is an example of an urban cluster outline map. It shows the boundaries of urban cluster 85141 Storrs, Connecticut.

This urban cluster overlaps parts of three census designated places—Storrs, South Coventry, and Coventry Lake. The map also shows part of the boundary of the Willimantic, Connecticut, Urban Cluster and the Hartford, Connecticut, Urbanized Area.

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Map Products

U.S. Census Bureau

What's New | Map Products Boundary Files On-Line Mapping Related Sites Contact Site Map
Cartographic Products Geography

Census Bureau Map Products

Welcome to the Census Bureau Map Products page. Census Bureau maps are organized into two categories: Reference Maps and Thematic Maps. Select the description link located beneath each map title to access more information about each map. To view or download maps, select a vintage. Note: The maps listed on this Web page are designed to be viewed with ADOBE Reader versions 4 and 5. If you do not have ADOBE Reader, you can download it for free from ADOBE

- How to Find the Maps you Need
- How to Print Large Format PDF Map Files [PDF]
- Viewing Tips for PDF Map Files Contains plotter specification information
- Viewing the thumbnail images for the 1990 Census Tract PDF Map files.

REFERENCE MAPS (description)

Census Geography

- Congressional District Map Products
  109th Congressional District Maps and Related Information
  109th Congressional District Maps and Related Information
- American Indian Tribal Census Tract Outline Maps:
  Description 2000
- American Indian/Alaska Native/Hawaiian Home Land Block Maps:
  Description 2000
- Census Block Maps: (Also available on DVD)
  Description 2000 | 1990
- Census Tract Outline Maps: (Also available on DVD) and CD-ROM
  Description 2000 | 1990

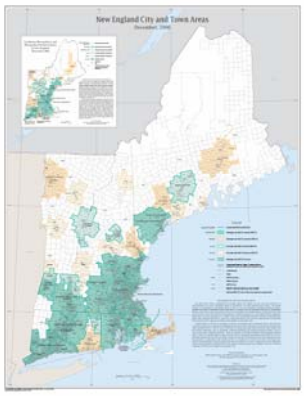
Clicking on the Map Products link brings the user to the main Map Products page. Users can obtain reference maps and thematic maps from this page. Reference maps show the boundaries of census areas like census tracts. Thematic maps map statistical data for geographic areas.

This page also provides information on how to find the maps of interest, print large-format .pdf files, and view .pdf map files.

Census Geographic Data Initiative

- **MAP PRODUCTS⇒**
  REFERENCE MAPS ⇒
  Metropolitan Areas Maps ⇒
  New England City and Town Area Wall Maps:
  2006 New!! | 2003

- Handout Example



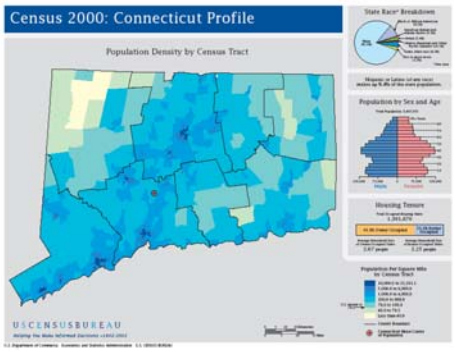
This is an example of the path used to reach a reference map of New England City and Town Metropolitan Areas for 2006 in .pdf format for viewing or downloading.

An example of the map is provided in the handout.

Census Geographic Data Initiative

- **MAP PRODUCTS⇒**
  THEMATIC MAPS ⇒
  Census 2000 Population Profiles: ⇒
  <u>2000</u> ⇒
  <u>Connecticut</u>

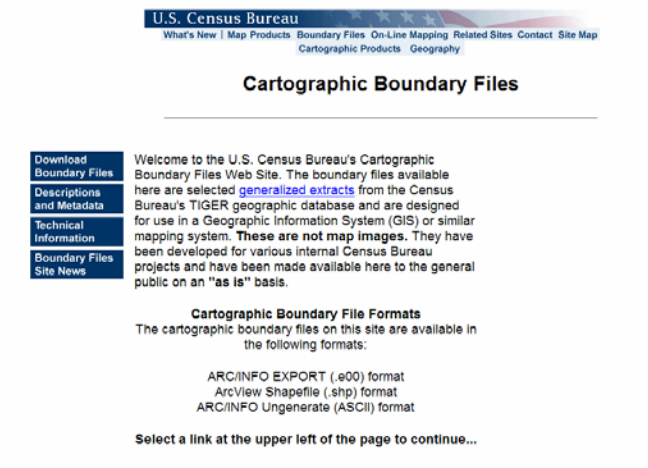
- Handout Example



This is an example of the path used to reach a thematic map provided a population profile for the state of Connecticut for 2000. This profile is also in .pdf format and a copy is included in the handout.

Census Geographic Data Initiative

Boundary Files



In addition to distributing published maps prepared by the Bureau of The Census, the Mapping section also distributes geographic data files of cartographic boundaries for use in geographic information systems so that users can prepare their own maps.

Clicking on the Boundary Files link brings the user to this section of the Web site.

Note that these boundary files are generalized for small-scale mapping purposes. Small scale maps are maps of relatively large areas that show only limited detail. For example, a map of the state of Connecticut like the thematic map we just looked at has a generalized shoreline because all of the details of the shoreline cannot be represented when mapping such a large area on such a small map.

These boundary files are therefore useful for mapping census data but not for performing other types of GIS analyses like determining which census tract a particular point is located within.

The files can be exported in a variety of formats: ArcINFO Export format is an interchange format, Shapefile format is an open source format for digital geospatial databases, and ArcINFO Ungenerate format is ASCII format. ArcINFO is a GIS software package.

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Boundary Files

- Boundaries of census areas like tracts or block groups
- Used with GIS software
- UCCGIA ESRI Site License

  http://www.geography.uconn.edu/esri/

The University of Connecticut Center for Geographic Information and Analysis administers a site license for this software. For more information about the site license, visit:

http://www.geography.uconn.edu/esri/

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Downloading Boundary Files

- Click on Download Boundary Files
- Note that the block group level is the lowest level of geography available—no blocks
- Click on link to geography of interest
- Click on file format of interest
- Click on geographic area of interest

To download generalized boundary files, click on the Download Boundary Files box. Note that the block group level is the lowest level of geography available—no boundary files are available for census blocks.

Click on the link to the geography of interest.

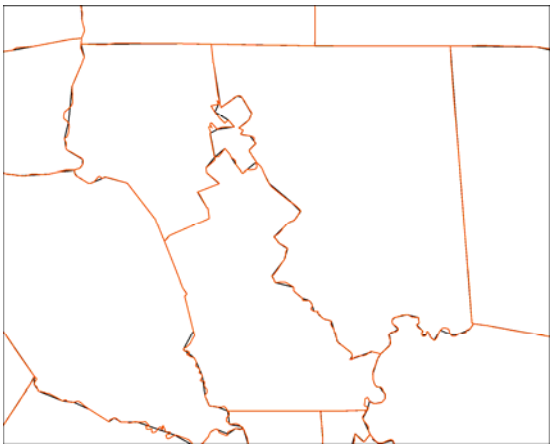
Click on the file format of interest.

Then, click on the geographic area of interest.

Census Geographic Data Initiative

Connecticut 2000 Tracts Example

- Generalized (black) versus TIGER (orange)

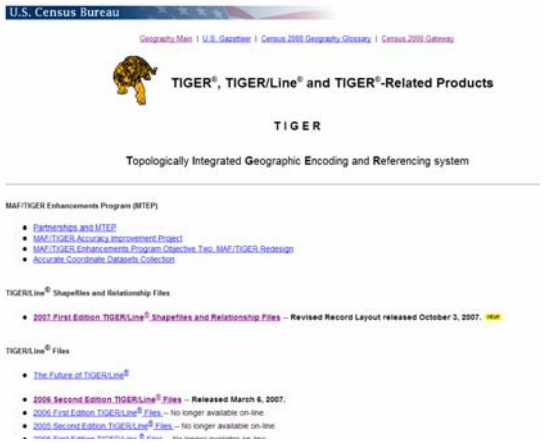


This example shows the difference between the generalized boundary file for tracts for Connecticut (shown in black) and the TIGER/Line file segments from which the boundary files were generalized (shown in orange).

It is also possible to download the more detailed TIGER/Line file data from the Census web site.

Census Geographic Data Initiative

TIGER



TIGER is the second component of the Geography section on the Census Web site. TIGER stands for Topologically Integrated Geographic Encoding and Referencing system. The TIGER database was first developed for the 1990 Census but it built on the GBF/DIME (Geographic Base File/Dual Independent Matching Encoding) files developed and used, primarily in urban areas, for the 1980 Census. The TIGER/Line files are a database of line segments of relevance to the Census (street centerlines, political/administrative boundaries, surface water features, and so on).

TIGER is one of the few national digital spatial databases and its development and availability were a major impetus behind the growth of GIS in the U.S. in the 1990s.

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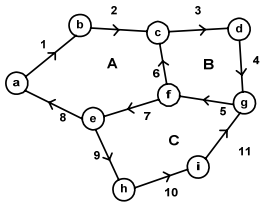
TIGER

- First developed for the 1990 census
- Topological
- Supports address-match geocoding
- Build polygons



Directed Arcs, Nodes, and Areas

Arc	Start Node	End Node	Left Area	Right Area
1	a	b	X	A
2	b	c	X	A
3	c	d	X	B
4	d	g	X	B
5	g	f	C	B
6	f	c	A	B
7	f	e	C	A
8	e	a	X	A
9	e	h	C	X
10	h	i	C	X
11	i	g	C	X

In a vector database with topology, the relationships between line segments, the nodes where they intersect, and the areas that they bound are explicit. This makes it possible to geocode locations based on street address and to build boundaries of geographical units in the Census hierarchy of places for which population and housing data are reported. It almost makes it possible to build other geographical areas from Census geographic data.

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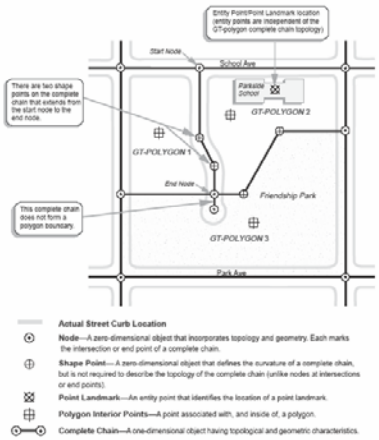
Basic TIGER/Line File Topology

- Handout Example
- Technical Documentation



http://www.census.gov/geo/www/tiger/tiger2006se/TGR06SE.pdf

This example shows how TIGER works as a topological database. In addition to start nodes and end nodes, shape point are used along line segments to give them the appropriate cartographic appearance.

This schematic is found in the handout. It is taken from the Technical Documentation for the latest version of TIGER.

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TIGER Data

- Geography only - ***no*** other census data
- Updated versions released throughout intercensal period
- Technical documentation available for each release

TIGER data contain data on Census geography only. They do not include data on population and housing characteristics collected from households.

As the web site shows, updated versions of TIGER are released throughout the intercensal period. Technical documentation is published for each version released.

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Downloading TIGER Data

- Click the link to the version of interest
- Click on the geographical area (state) of interest
- Click on the zip file for the county of interest
- Process the data using GIS software

To download TIGER data, click on the link to the version of interest. Then click on the link to the geographical area (state or state equivalent) of interest. Then click on the zip file for the county of interest.

There is one TIGER/Line file (in a compressed format) for each county or county equivalent. The file names consist of TGR + the 2-digit state FIPS (Federal Information Processing Standards) code + the 3-digit county FIPS code (i.e. TGR09001.ZIP for Fairfield County, Connecticut.) Each state folder contains individual county files as well as a Counts file. The county files are stored in compressed format and are compatible with PK Ware's PK Zip software. The COUNTSnn.TXT files (where "nn" is the state FIPS code) show the counts for the number of records for each record type by county for a state. If the count for a particular record type is 0, then that record type does not exist for that county.

To date, the Census Bureau has produced the TIGER/Line files in ASCII text format only; therefore, the data are **NOT** in the form of map images. To create maps with the TIGER/Line files, one would typically use a Geographic Information System (GIS) package or other mapping software.

Users are responsible for converting or translating the files into a format used by their specific software package. For information on how to use the TIGER/Line data with a specific software package one should contact the company that produced that software.

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Major Change in TIGER

- Beginning soon, TIGER files will be distributed in ***shapefile*** format
- Monitor Census web site for developments

  http://www.census.gov/geo/www/tiger/tgrshp.html

Major changes are occurring in TIGER.
Beginning soon, TIGER files will be distributed in shapefile format. This is an open format widely used for digital vector geospatial data.

With the modernization of the Master Address File (MAF) and Topologically Integrated Geographic Encoding and Referencing (TIGER®) systems to use an Oracle relational database instead of our home-grown database, the Geography Division is thinking ahead to new spatial data products. From the modernized MAF/TIGER System, the Geography Division will make available:

Shapefiles

TIGER/GML™

The Census Bureau also will make available the TIGER spatial data over the web: WebTIGER™ — A Web Feature Service (WFS) interface allowing requests for geographic features across the web. It uses the XML (Extensible Markup Language)-based GML (Geographic Markup Language) for data exchange.Web Map Server (WMS) — A WMS producing maps of spatially referenced data dynamically from TIGER in PNG, GIF, and JPEG formats or as vector-based graphical elements in Scalable Vector Graphics (SVG)

The TIGER section of the Census web site is being updated frequently to provide TIGER data users information on new developments.

The most recent revised record layout was just released on October 2, 2007.

Integrating Data with Other GIS Data

- TIGER data are national, often 1:100,000 scale/ Local geospatial data usually more accurate and larger scale
- TIGER uses geographic coordinates (lon/lat)/ Local geospatial data usually projected
- Use TIGER to gather information to create census units from more accurate local data

Many analysts want to integrate TIGER data with other GIS data layers. In order to integrate properly in a GIS, data must have the same scale and projection.

TIGER is a national database. Although data may be of different scales depending on the sources used to capture the line segments in TIGER, most data are 1:100,000 scale. Geospatial databases for local areas are usually more accurate and larger scale.

TIGER, as a national database, uses geographic coordinates (lon/lat). Geospatial databases for local areas are usually projected. GIS can be used to project TIGER data but the level of generalization is still a problem.

A useful approach to integrating Census data with local data is to use information on the boundaries of Census units from TIGER or from Census map products to create census units from the more accurate local data. Assign the Census identifiers to these units and then Census population and housing data can be joined to census boundary files.

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Gazetteer

- Definition of gazetteer
- Gazetteers available for selected geographies for 2000 and 1990
- For 2000, click on link to gazetteer
- Select ASCII or compressed format
- Select geography of interest
- Handout example

The last component in the Geography section of the Census web site is the Gazetteer.

A gazetteer is a geographic reference that supplies place name and location information, including the coordinates of a place. Many atlases contain gazetteers.

The Census published gazetteers for 2000 and 1990 on its web site. For 2000, click on the link to the gazetteer of interest, select ASCII or compressed format, then select the geography of interest.

The record layout can be viewed separately.

The handout includes an example of several records for Connecticut.

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American FactFinder

- Tutorial
  http://factfinder.census.gov/home/en/epss/tutorials.html
- Finding Census geography for an address
- Handout

The final portion of the Census web site to investigate is the American FactFinder. American FactFinder was created to help users obtain data in the form of maps, tables, and reports from a variety of Census Bureau sources.

The link to American FactFinder is located on the main page of the Census Web site.

From the American FactFinder site, there is a link to address search to find 2000 Census data.

The Handout contains information on using the address search capability of the American FactFinder.

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Other Sources of Census Geographic Data

- National Historical Geographic Information System
  http://www.nhgis.org/
- National Archives
  http://www.archives.gov/
- Third CGDI Workshop
  Census Geography Items in the
  Homer Babbidge Collection
  February 13, 2008
  2:00 – 3:00 pm
  Library Level II Lecture Center

The Census Web site contains very little historical geographic or thematic data from the Census. Other sources of information include the National Historical Geographic Information System and the National Archives.

The third workshop in this series, to be held on February 13, 2008, will focus on Census Geography Items in the Homer Babbidge Collection.

Thank you for your participation in the workshop.