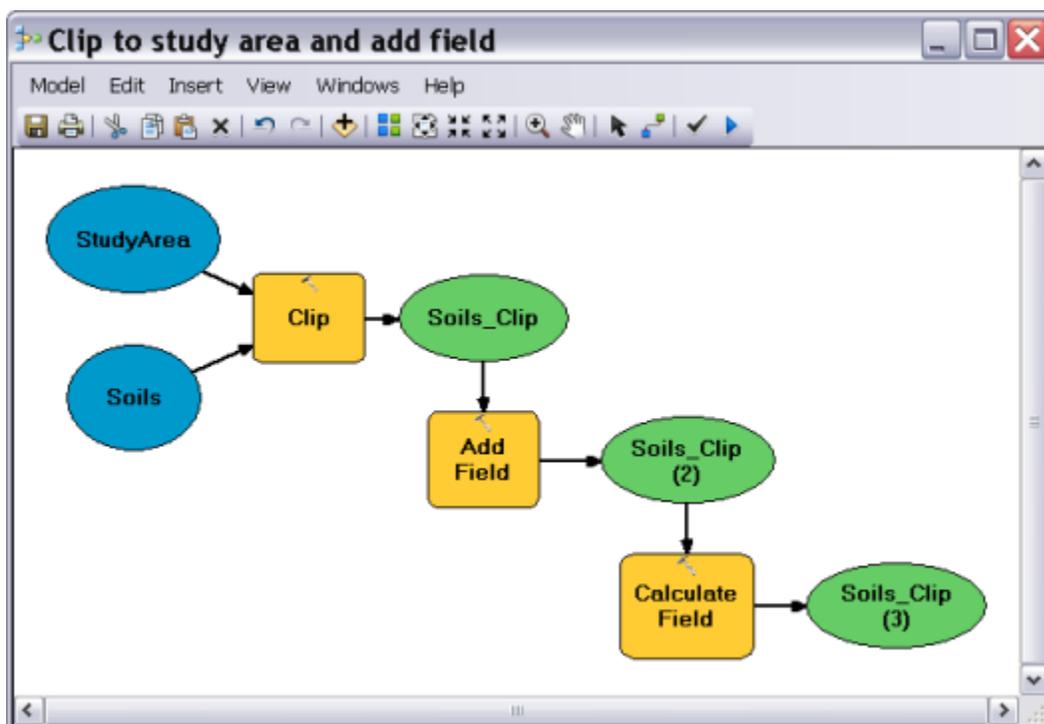


Cookbook 2 December 2013 *Census Data and ModelBuilder*

Overview

1. Census Data
2. Census Data Sources
3. Introducing ModelBuilder



What is ModelBuilder?

http://resources.arcgis.com/en/help/main/10.1/index.html#/What_is_ModelBuilder/002w00000001000000/

1) Census Data

The United States Census is a decennial census mandated by the United States Constitution. The population is enumerated every 10 years and the results are used to allocate Congressional seats (congressional apportionment), electoral votes, and government program funding.

- Mandated by the U.S. Constitution.
- Used to apportion seats in the U.S. House of Representatives.
- Used to define legislature districts, school district assignment areas and other important functional areas of government.

The United States Census Bureau (<http://www.census.gov/>) collects a variety of data:

- 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 & Economic
- Economic Indicators - each indicator is released on a specific schedule, see the Economic Indicator Calendar



More information at <http://www.census.gov/aboutus/>.

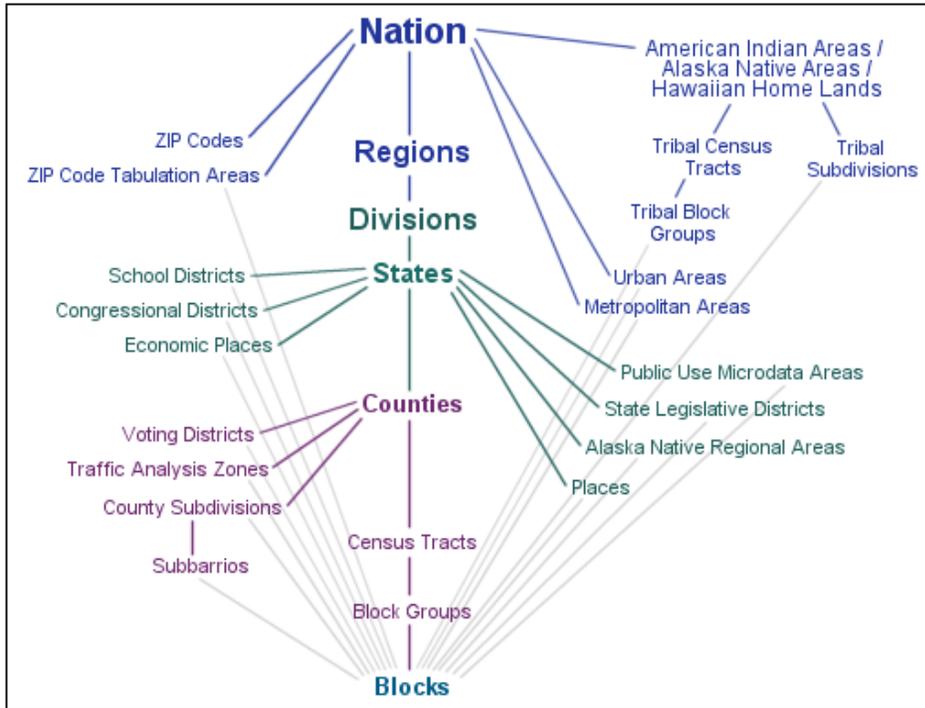
Census Organization

Census geography is organized on a number of different levels. Some of the levels fit completely within one another, while others may cross the boundary of a larger level.

The basic hierarchical organization of census geography is Nation > States > Counties > County Sub-Divisions > Census Tracts > Block Groups > Blocks, with each level nested completely within its predecessor.

These levels cover all areas in the United States, and added up, their populations equal the entire population of the United States. Other levels, such as places, can cross the boundaries of other levels, and some, such as ZIP codes, do not cover all areas of the United States. ZIP codes only cover those where mail is delivered.

The diagram below shows the relationships between different levels of census geographies. A line between two levels represents a hierarchical relationship between them, meaning that the larger, generally displayed near the top of the diagram, can be subdivided into the smaller level.



Demographic Data

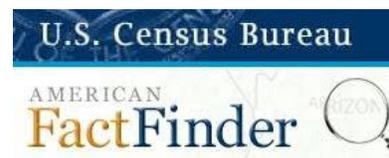
Census Block	Smallest census unit (population ~85), usually defined by roads ~8.5 million blocks in the 2000 census
Block Group	Blocks are assembled into block groups, population ~600 to 3000 Smallest census unit with detailed demographic statistics
Census Tract	Block groups are assembled into census tracts. Census tracts represent fairly homogenous, permanent areas with similar demographic and economic characteristics, population ~1,500 to 8,000. Supposed to represent a typical “neighborhood”
Counties	Census tracts are grouped into counties, which are the primary division of most states.
States	50 states District of Columbia, Puerto Rico, U.S. Virgin Islands, Guam, American Samoa, and the Northern Mariana Islands are treated as state equivalents for statistical presentation.

2) Census Data Sources

American FactFinder

<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>

= *the official way to get census data.*



- Downloading 2010 Census Data using American FactFinder (Tufts University)
<http://www.westfield.ma.edu/uploads/cbraun/tufts2010census.pdf>
- Working with 2000 US Census Data in ArcGIS (Tufts University)
<http://www.westfield.ma.edu/uploads/cbraun/tufts2000census.pdf>
- Census Tip Sheet (Tufts University)
<http://www.westfield.ma.edu/uploads/cbraun/tuftscensustips.pdf>

MassGIS

MassGIS distributes datalayers from the 1990, 2000, and 2010 U.S. Census at:

<http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/layerlist.html>

- Working with Census 2000 Data from MassGIS (Tufts University)
<http://www.westfield.ma.edu/uploads/cbraun/tuftsmassgiscensus.pdf>

Social Explorer

Social Explorer is a great website to explore current and historic census data. You can create maps and reports for display and download. The Free Edition is already good, but the Professional Edition is even better: all census data for anywhere and anytime!

Free Edition: <http://www.socialexplorer.com/>
Professional Edition (on-campus) <http://www.socialexplorer.com/>
Professional Edition (off-campus) WSU Library, Databases, Social Explorer, Login

Have a look at the GIS Resources page for great Social Explorer tutorials!

<http://www.westfield.ma.edu/cbraun/resources/gis-resources/>

GISNuts.com

Nationwide county, census tract, and block group level census data in file geodatabase format (i.e. geography and SF1 demographic data already linked!).

<http://www.gisnuts.com/terra/CensusData>

3) Introducing ModelBuilder

ModelBuilder is an application with ArcGIS you can use to create, edit, and, manage models. Models are workflows that string together sequences of geoprocessing tools, feeding the output of one tool into another tool as input. ModelBuilder can also be thought of as a visual programming language for building workflows.

Or: an automated flowchart!

For example: our site selection study for Westfield where you executed a sequence of tools and analysis steps to arrive at your final selection. All this can be packaged as a model in ModelBuilder so you can perform the site selection with 1-click for all 351 cities and towns in Massachusetts while you go grab a coffee.

= It takes time and effort to create a model, but you (often) save time at the end!

3.1) Videos

Getting Started with ArcGIS ModelBuilder

http://www.uvm.edu/~joneildu/Video/GIS_Open/ModelBuilder/ModelBuilder.html

Runtime 09:45 minutes

Using ModelBuilder in ArcGIS 10.x for Desktop

<http://youtu.be/q2fEdw5uMQA>

Runtime 10:44 minutes

ModelBuilder Introduction

<http://www10.giscafes.com/video/Esri-ModelBuilder-Introduction/38585/media.html>

Runtime 10:44 minutes

More Esri Videos about ModelBuilder at <http://video.esri.com/tag/56/model-builder>

3.2) Tutorials

Tutorial: Executing tools in ModelBuilder

http://resources.arcgis.com/en/help/main/10.1/index.html#/Tutorial_Executing_tools_in_ModelBuilder/002w0000007t000000/

Tutorial: Creating tools with ModelBuilder

http://resources.arcgis.com/en/help/main/10.1/index.html#/Tutorial_Creating_tools_with_ModelBuilder/002w0000007v000000/

Using ArcGIS ModelBuilder to batch process files

<http://gis.mtu.edu/?p=738>