Data Creation and Editing

Based in part on notes by Prof. Joseph Ferreira and Michael Flaxman

Lulu Xue | Nov. 3, 2010
Overview

• The intention of today’s lecture
  • Part 1: Retrieving and creating GIS data from non-spatial data
  • Part 2: Editing GIS data

• Part 1: Now we have been exposed to several kinds of data sources:
  • Spatial data: shapefiles, coverage, satellite imagery
  • Attribute information: .dbf, .mdb

• Are these the only options we have?
An example: Open street map

- open street map
Geospatial data in a broader sense

Less accurate & more conceptual

Mental maps
Place names
Addresses
Imagery

More precise

XY coordinates (or Z, or Time)

Data formats
Data collection 1: collecting data in the field

• Mini-Course: DUSP Field Data Collection Module (Dan Sheehan) 2:00 – 4:00 PM, November 9/16/18/23

Digital footprints
Data collection 1: collecting data in the field

- How to get the (x, y) coordinates to show up in ArcGIS?
- Create a point shapefile from X-Y points in a table.
Data collection 1: collecting data in the field
Data collection 2: Digitizing Data

- There are several ways to digitize new features.
  - Digitizing a hard copy of a map on a digitizing board
  - Digitizing "on screen" or "heads up" over an image
  - Using automated digitization.
Heads-up Digitizing (Arc Edit)

• To enable the Editor toolbar in ArcMap, you need to have an existing feature class to edit
Heads-up Digitizing (ArcSketch)

- An add-on for ArcGIS that provides you with sketch tools to conceptualize and draw your map features.

Free download available at ESRI website
Case 1: Digitizing Projected images

Demonstrate the use of ArcEdit to create a new shapefile of polygons via “heads-up” digitizing
• Projected image
• Unprojected image

• Create an empty shapefile in ArcCatalog
• Navigate to a writeable directory and choose File\New\Shapefile
Case 1: Digitizing Projected images

- Specify polygon features
- Specify WGS 1984 Auxiliary coordinate
- Save the empty shapefile with a name such as newpolys.shp
- Add basemap (ArcGIS world layer) and empty newpolys.shp to ArcGIS
1. Start an edit session (start editing).
2. Choose which layer within your workspace you want to be the target layer.
3. Choose whether you want to create new features or edit existing ones.
4. Set up additional properties or options, such as turning on snapping, setting which layers are selectable, and specifying input units.
5. Choose a tool. The Editor toolbar contains the most frequently used simple-feature editing tools.
6. Add or edit attributes of the feature.
7. Save edits and stop editing.
Case 2: Digitizing Unprojected images

- Before digitizing: check the coordination system of your image map.

1. Scanned map datasets don't normally contain spatial reference information.

2. Satellite imageries don't align properly with other data you may have.
Case 2: Digitizing Unprojected images

Now we have a valid coordinate system, but our image is clearly pretty far from being correctly registered.
Georeferencing align, or georeference raster datasets. Spatial adjustment transform, rubber-sheet, and edge-match vector features.
Georeferencing

1. Add the raster dataset that you want to align with your projected data in ArcMap.

2. Add control points that link known raster dataset positions to known positions in map coordinates (the order matters!).

3. Save the georeferencing information when you’re satisfied with the alignment.

4. Optionally, permanently transform the raster dataset.
An example of spatial adjustment
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Geocoding

- Geocoding is the process of finding associated geographic coordinates (often expressed as latitude and longitude) from other geographic data.

- Geocoding typically uses *Interpolation* as a method to find the location information about an address.
  - E.g., if the address along one side of a block range from 1 to 199, then address Number = 66 is about one-third of the way along that side of the block.
Geocoding

- Data needed for geocoding:
  - A list of addresses saved as a database or a text file
  - Street centerlines with street names and address ranges on both sides of streets.

- Limitations?
Online Geocoding

• Sometimes you just need to find one or a few addresses and mark them on a map.
• ArcGIS online World Geocoding (free webservice)

Googlecode
http://gmaps-samples.googlecode.com/svn/trunk/geocoder/singlegeocode.html
Geospatial data in a broader sense

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Data formats
Look up place names in Gazetteer

• A place name—One or more keywords that can be used to search for a place (e.g., a country, city, river, or any geographic feature).
• A description of the place—A statement clearly identifying the place.
Geospatial data in a broader sense

- Mental maps
- Place names
- Addresses
- Imagery
- XY coordinates (or Z, or Time)

Less accurate & more conceptual

More precise
Conceptual (or mental) maps

TagMaps: The aim of TagMaps is to provide a mental map of the city by using the photos and tags uploaded by photographers on the Flickr image sharing website.