GIS Workshop Examples Instructions 2008-09

--Robert Nash Parker
More examples can be found in: ***GIS and Spatial Analysis for the Social Sciences: Coding, Mapping, and Modeling***, Robert Nash Parker and Emily K. Asencio, Routledge Press, 2008, order at Amazon.com (search for 'GIS and Spatial Analysis for the Social Sciences paperback' or enter '9780415989626') or at www.routledge.com/books/GIS-and-Spatial-Analysis-for-the-Social-Sciences-isbn9780415989626.

Geocoding Process

1. Open ArcMap
2. Add data for a map to the session (black cross with yellow background on tool bar)---*.shp file
3. Add data for street layer---*.shp
4. Label Street Layer
    a. Right click on layer name in table of contents
    b. Click on 'Label Features'
5. Create Address locator
    a. Open Tool Box
    b. Double click on 'geocoding tools'
    c. Double click on 'create address locator'
    d. Select address locator style
    e. Select Reference Data—street layer from #3 above
    f. Click box under 'Role' in Reference Data box
    g. Double click on drop down to expose choice between 'primary table' and 'alias table'
    h. Click Ok
6. Add Spread sheet with items to be geocoded---'*.dbf'
7. Click on Tools
8. Select Geocoding
    a. Select Geocode Addresses (first time; otherwise select review/rematch)
    b. Look to be sure that address locator created above is highlighted; if not, click on add, find locator, and add to box; click ok
    c. Make sure spread sheet with geocodable incidents is shown in the 'address table box; if not, click on the drop down and click on the proper table
    d. Under address input fields, click on the drop down and see a list of the columns in the geocodable spread sheet; select the one that has the address in it.
    e. Rename output layer for the result of the geocoding—asa1.shp
    f. Click on geocode options; examine and modify if desired; click ok
    g. Click ok to commence Automatic Geocoding
9. Examine results of automatic geocoding

10. Click ‘Match Interactively’ to begin interactive geocoding
    a. 2624 E Alessandro---zoom to candidate
    b. Intersection: Indiana & Lake Point
    c. Acacia Glenn Dr, Acacia st……
    d. Niki Way—code with informed judgement

Joining Results of Geocoding to the Spatial Map

1. Perform a spatial join by first highlighting the spatial unit map layer
2. Right Click on the highlighted layer and select Joins and Relates; select Join…
3. Make sure the first box says, ‘Join data from another layer based on spatial location
    a. Under 1. select the layer to join to this (the highlighted) layer, make sure your geocoded results layer is shown
    b. Under 2. you are joining…’ it should say ‘points to polygons’
    c. Under 3. the result of the join will be saved into a new layer, retype the output file name---asa1_count.shp
    d. Click Ok
4. Check success of join by highlighting new layer
    a. Right click on new layer
    b. Select open attribute table
    c. Look for new count column at the end of the table

Creating a Thematic map to display the rate of geocoded data per population

1. Right click on new layer; select Properties
2. Click on ‘Symbology’
3. Click on ‘Quantities’
    a. Under fields, click on Value; select the ‘Count’ field
    b. Under normalization, select appropriate population denominator
    c. Can modify the category boundaries, number of categories, and re-label to create standardized rates and ranges; also change colors manually or with standardized ramps
    d. Click ‘Apply’ and Ok to display the map

Exporting a Map to be used in another Software Program

1. Click on File; click on Export a map
2. Select the type of map to save; type a title
3. Minimize ArcMap; Open Powerpoint
4. Click on Insert; picture; from File
5. Click on map export; resize for Powerpoint; Add Title

Adding a graphic display to show multiple variables on the Map

1. Double Click on the Layer name to open the Properties Menu
2. Click on Charts; Select Stacked
3. Select Indicators (variables) and colors
4. Modify Chart properties and size
5. Add Normalization variable for Rate calculation
6. Click on Apply; close Properties menu
7. Zoom in to see details

Spatial Statistics

1. To Calculate Moran's I
    a. Click on tool box
    b. Double Click on Spatial Statistics
    c. Double Click on Analyzing Patterns
    d. Double Click on Spatial Autocorrelation
    e. Drop down for input feature class—the layer your spatial data is in—the new layer from the join operation
    f. Drop down for input field—count
    g. Click on display output graphically
    h. Use Polygon Contiguity for spatial conceptualization
    i. Make sure distance band box has '0' entered
    j. Click Ok

2. To Calculate Anselin's Local Moran's I for clustering
    a. Double Click on Mapping Clusters
    b. Double Click on Cluster and Outlier Analysis
    c. Same choices as Moran's I
    d. Give a name for output layer
    e. Right click on new layer; properties; symbology; quantities
    f. Display LMz variable at end of table
    g. Compare to thematic map for clusters—negative opposite of cluster; 0 means random; positive means cluster of similar high numbers

3. To Calculate Getis-Ord hot spot statistic
    a. Double click on Hot spot analysis
    b.Same as above except select Polygon Contiguity under Conceptualization of Spatial Relationship
    c. Make sure 0 is entered in distance band box (makes no difference, routine will not run without entry)
    d. Click Ok
    e. Right click on new layer; properties; symbology; quantities
    f. Compares values of unit to average of all units