



Geography

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Forensic Geography

Lab: Preparing Address Data for Geocoding

Background

One of the most commonly used tools for people using GIS is geocoding. Geocoding, also sometimes called “address mapping”, essentially takes a physical address (like a house/business address) and converts that address to a latitude/longitude pair of coordinates that shows up on a map as a point (dot). In recent years, our ability to map thousands of addresses with pinpoint accuracy, almost effortlessly, has grown enormously.

More general addresses, like a ZIP code, or county, for example can also be geocoded as points. Generally, the geocoding tool will place a point at the centroid (middle spot) in a polygon (like a ZIP) code. If multiple instances of a single ZIP code may result in many points pile atop each other, hiding the number of points in a single location.

Geocoding criminal activity, the addresses of police stations, fire stations or even businesses, like liquor stores, may prove very useful to the criminologist or forensic geographer.

Unfortunately, many good sources of address data is served in a GIS-hostile fashion, require some skill with spreadsheet logic to prepare it for the GIS software.

Skills

You will demonstrate two strategies commonly used to geocode data, and demonstrate an ability to gather address data from a typical state database.

1. Students download data from a state database
 2. Students prepare data to be mapped in a GIS using MS Excel
 3. Students map address database in ArcMap 10
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Task

For this lab you will gather a list of liquor licenses issued in Los Angeles County, geocode those addresses using two strategies and map those addresses in ArcMap 10 over a census tract base map.

Download Data

1. First, you should gather some data. For this lab, you will download liquor licenses from the State of California State Alcohol Beverage Control Office. One of the download options is at the link below:

<http://www.abc.ca.gov/datport/SubscrMenu.asp>

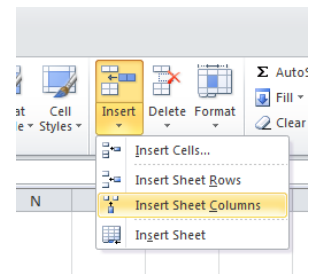
2. Look for the Ad Hoc reports option toward the bottom.
3. Select the “Query by City and License Type information” option
4. Scroll down until you find “Altadena”

5. Select the “Active Retail Licenses (*On-Sale and Off-Sale*)”
6. Click Continue
7. A table will appear in the window. This is your data.
8. Highlight the ENTIRE table and click Control+C to copy the table into the clipboard.
9. Paste the table’s contents into Excel. Use the ordinary paste option. Save this new file.

Prepare Data for GIS

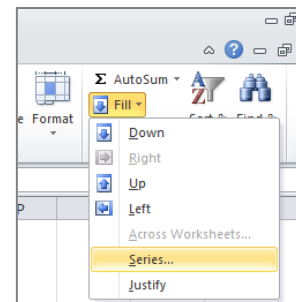
10. Notice that some of the cells are larger than others. That’s because they’ve been “merged”, which is a very unhelpful strategy because some bits of data (like the addresses) are in data rows that include nothing else. We need to have all the data regarding each liquor store in a single row. ** Note there are other means of downloading data from the ABC website, but there are problems with each.
11. The following steps will guide you through a process to fix this common database-to-spreadsheet download problem, but you should pay close attention to the in-class tutorial. If this is too challenging for you, then you may find a ready-to-geocode list of liquor store addresses on the Y drive in your course folder (SFV_LIQUOR_ADDRESSES1.xlsx) Open that and skip to the Geocoding section.

12. Highlight the entire table. (Ctrl+Shift+End)
13. Click on the Merge & Center button to “unmerge” all the cells.
14. Click in cell A1 in the upper left corner of the spreadsheet.
15. Insert a column in the A column position (see image right).
16. Type “ID” in cell A2, type “ID2” in cell B2. Type “status” in cell D2, “Owner” in cell H2 and “Business” in cell I2. This insures that you have no blank header cells. (see below)



	A	B	C	D	E	F	G	H	I	J	K	L
1			License	Status	License	Orig. Iss.	Expir	Primary Owner and Premises	Business Name	Mailing	Geo	
2	ID	ID2	Number	Status	Type	Date	Date	Owner	Business Name	Address	Code	
3		1)	<u>46297</u>	ACTIVE	57	09-27-1995	07-31-2012	ALTADEN A TOWN & COUNTRY CLUB	ALTADEN A TOWN AND COUNTRY CLUB		1900	

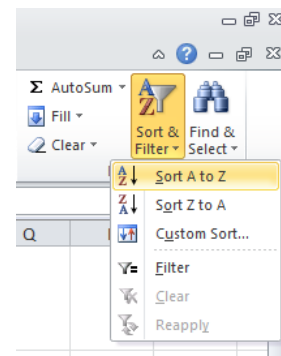
17. Now create an Index column in column A (under the word) ID. First enter “1” in cell B3.
18. Highlight the rest of the column. Try Ctrl+End) to jump to the bottom of the spreadsheet quickly. Cntl+Shift+↑ to highlight the column from the bottom up. Make sure the 1 in cell B3 is highlighted.



19. With the cells highlighted, click the Fill button and select from the drop down menu, select "Series". A dialog window will open with the default options already perfect. Click OK.
20. A column of ID numbers will appear in the ID column from 1 to 115. This is the column you will use to re-sort your data in a moment.
21. Return to the top of the table.
22. Click in the cell with the word "Owner" (H2). The column below contains four separate, but useful bits of data that should be in four separate columns:
 - a. Owner
 - b. Street Address of store
 - c. City, State and ZIP code of store
 - d. Census tract of store
23. To put this data in new columns, first you must insert 3 new columns.
24. Click on cell I2 (with the word Business Name in it). Insert a column (see step 15 above)
25. Press F4 button twice to repeat the insert function twice.
26. Type column headers "Street", "City", and "Tract" in the newly blank column header cells (see below).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1			License	Status	License	Orig. Iss.	Expir	Primary Owner and Premises				Business Name	Mailing	Geo	
2	ID	ID2	Number	Status	Type	Date	Date	Owner	Street	City	Tract	Business Name	Address	Code	
								ALTADEN A TOWN				ALTADEN A TOWN			

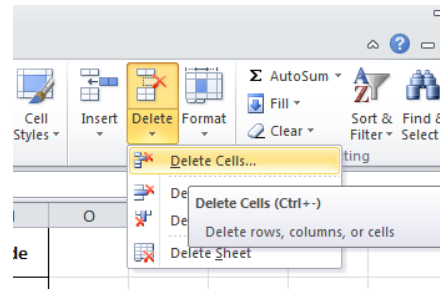
27. Click in the cell with the word "Owner" in it (cell H2).
28. Click the Sort & Filter button. Select from the drop down menu the "Sort A to Z" option" to sort the table alphabetically using the data in column H.
29. Note that the addresses all "rise" to the top of the column. Cut and paste address data in the column to the right. (from column H to column I) so that it is now under the column header "Street".
30. Repeat the process until you have moved the City, State, ZIP data to the City column and the Census Tract data to the Tract column. There are 23 of each.



31. Click in cell A2 again ("ID"). Sort the table A-Z by the ID column now. Note the new pattern. (see image)

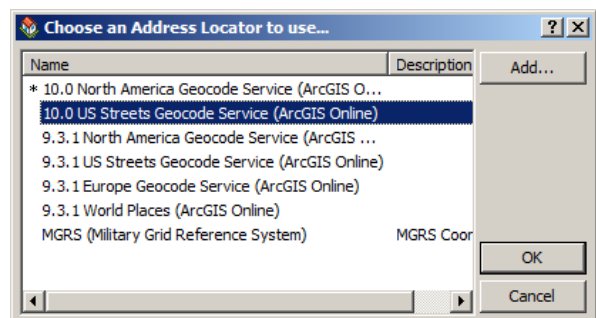
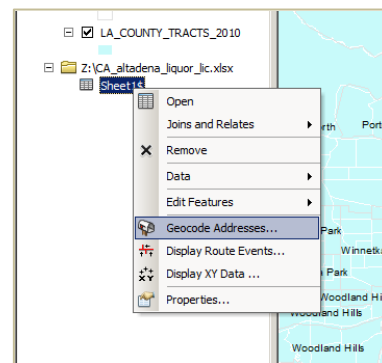
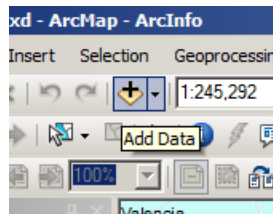
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
2	ID	ID2	Number	Status	Type	Date	Date	Owner	Street	City	Tract	Business Name	Address	Code	
3		1)	46297	ACTIVE	57	09-27-1995	07-31-2012	ALTADEN A TOWN & COUNTRY CLUB				ALTADEN A TOWN AND COUNTRY CLUB		1900	
4		2							2290 COUNTRY CLUB DR						
5		3								ALTADEN A, CA	91001-3202				
6		4										Census Tract: 4612.00			
7		5											2600		

32. Click in the cell just below the column header “street” ...click in cell I3.
33. Now delete that cell by clicking the “Delete” button and selecting from the drop down menu the Delete Cells option. Shift cells up...OK. (Alt+H/D/D OK). Note that the address cells are now on the same ROW as the rest of the data.
34. Repeat this process by shifting the city cells up (2 cells up) and the Tract data up by 3 cells. Press the F4 button (the repeat last action button) to do it quickly.
35. Delete the “Mailing Address” column by clicking on the M above cell M1 to highlight the column, then click on the Delete button.
36. Insert two additional columns to the right of City. Name these columns, “State” and “ZIP”
37. Highlight the “City” data cells and click on the Data tab, then click on the “Text to Columns” button.
38. Chose the “delimited” option in the first step, and select both “Comma” and “Space” in the Step2 window.
39. In the step 3 window, make sure that the column data format is “Text” for the ZIP code data.
40. Click Finish. It’s OK to replace the content of the adjacent cells...they should be empty!
41. Now sort by ID2 column (A-Z)
42. Delete the extraneous rows from the top (row 1) bottom of the table (rows 26-120). You should have a compact table with 25 rows and 15 columns of data. Save the spreadsheet in your Z drive. You may want to give top most sheet a name, like “addresses”.



Mapping the Addresses in ArcMap 10

43. Open ArcMap 10.
44. In your course folder, find the ArcMap project file “LA_COUNTY_TRACTS_ZIPS” so you can have a base map with a couple of common layers.
45. Click on the “Add Data” button to add your spreadsheet and worksheet. You may need to connect to your Z drive folder.
46. Right click on the file and sheet name containing the address table that you just added into the Table of Contents.
47. Chose “Geocode Addresses” from the drop down menu.
48. Select the US Streets Geocode service from the list of options in the dialog window that appears.
49. Click OK.



50. Wait a moment while the software connects with the online Geocoding service. (You must be connected to the internet for this to work properly).
51. The geocoding dialog window will appear. Just make sure your street, city, state and ZIP code columns are properly recognized by the geocoding service.
52. You may want to give the output file in the lower window a better name than “Geocoding_Result”. OK.
53. Note a new layer now appears in your Table of Contents and small dots appear on your map.
54. Finally, map the TYPES of liquor licenses. Right click on your new layer and select properties from the drop down menu.
55. Make sure the symbology tab is selected, and select from the layer properties dialog box Categories, unique values.
56. The value field should be “Type”, which indicates the various types of liquor licenses.
57. Click “Add All Values”
58. Uncheck “<all other values>”
59. Click OK.
60. Zoom in on the map to see Altadena.
61. See image below to get a sense of what the map should look like and if you click on the identify button and then click on a point marker, a pop up window will appear containing all the data from the table associated with that point.
62. Screen capture the image (Ctrl+Print Screen) and paste it into a MS Word file.
63. Include in the text of this word file, the name of the liquor business which is the northern-most liquor store in Altadena.
64. Name the file “Geography497_geocode_your_name”
65. Email the word file to your instructor for credit.

