

# Intermediate ArcGIS

## Goals of the workshop

- Cover the concepts of basic geoprocessing tools for spatial analysis: Geocoding, Clip, Buffer, Intersect, Dissolve, Spatial Join, and Point Density, etc.
- The exercises include creating and visualizing a market size for Japanese restaurants and various ways to visualize the Maryland traffic accidents data based on some of the tools mentioned above.

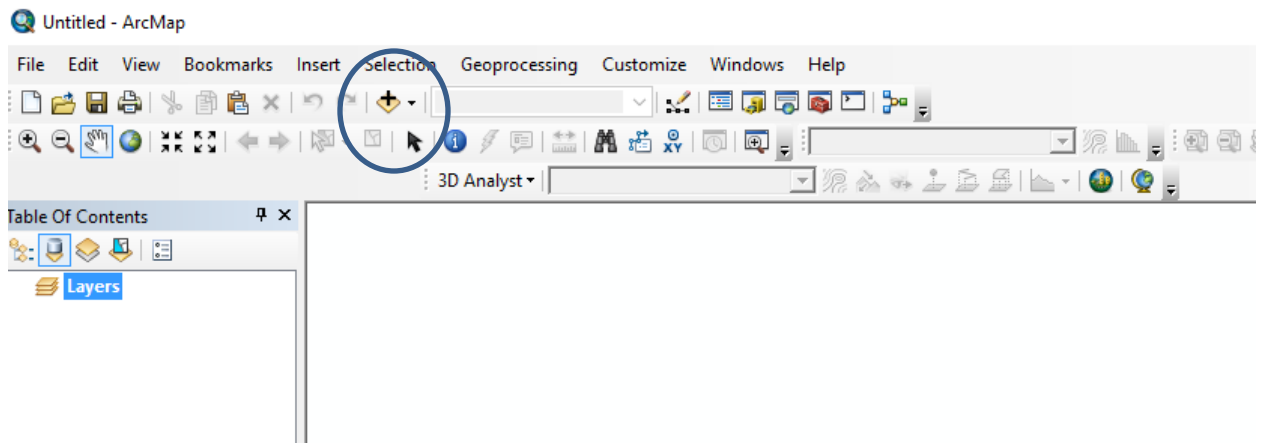
## Data:

- 1) Go to the Dropbox folder -> Workshop Files -> GIS Workshop Files -> Intermediate GIS
- 2) Copy all the files from Intermediate GIS to a folder on L:/datalab/<your name>:

**Note:** the data files include the three folders : Census Tract Data, Geocoding\_JapaneseR, and MD\_tract10.

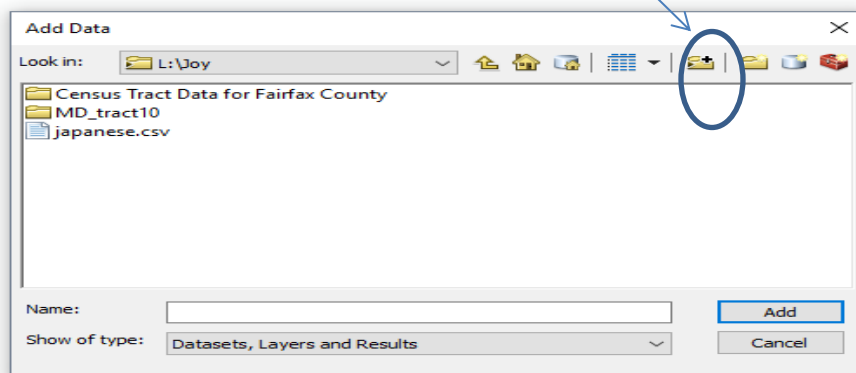
## Adding, View, and Check the coordinate system of your data.

- 1) Launch ArcGIS Desktop.
- 2) Click on Add Data in the Toolbar.



In the Add Data window that opens, click on Connect To Folder. Now, navigate to the folder you created on the L:/.

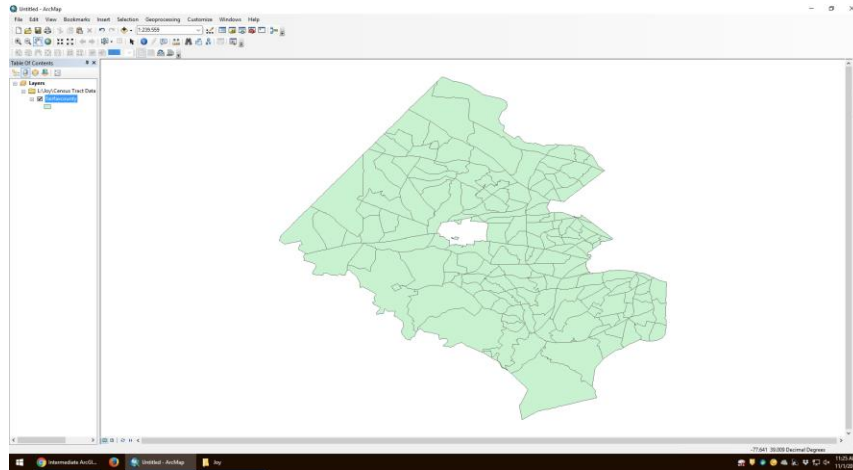
You should be able to see your files in the following view:



3) Now double-click on the Census Tract Data for Fairfax County folder>select the “ fairfaxcounty.shp” file and click ‘Add’.

4) You should see the Fairfax County boundaries now.

**Note:** Right click on the layer and select Properties and Source to see the coordinate of the layer.

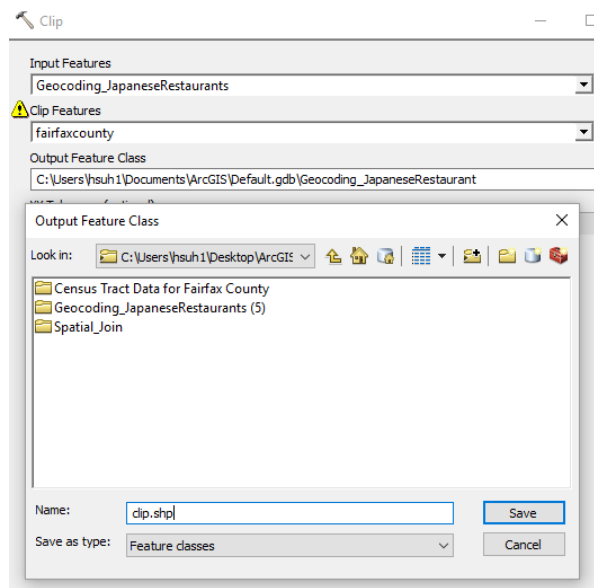


**Geocoding Exercise:** convert an Addresses data file to a point (shape) file

- 1) Add the ‘japanese.csv’ from your folder to your project in ArcGIS.
- 2) Right click on the csv and select Geocode Addresses and World Geocode Service (ArcGIS Online) and click on “OK”.
- 3) Log in with your ArcGIS Online institutional account to access this geocoding service (ask for an institutional account if you do not have one).
- 4) You will see a new point layer in the Table of Content indicating the Japanese restaurants in Fairfax County.
- 5) Save your restaurant data in your folder named as “JapaneseR.shp” (Right Click on the Geocoding\_JapaneseR>Data >Export Data). This makes the newly created layer to be editable.

**Clipping Exercise:** Extract those restaurants falling inside the Fairfax County Boundary

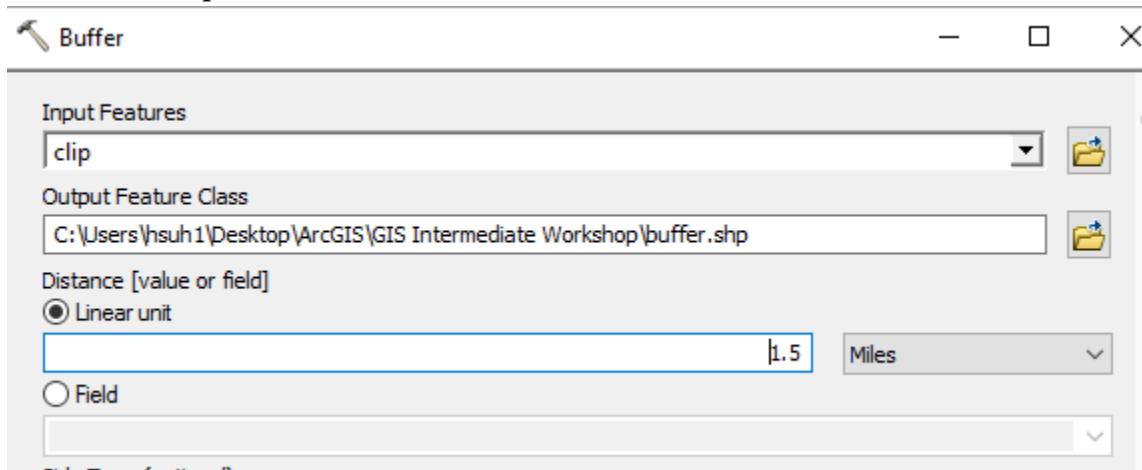
- 1) Click on Geoprocessing on the top menu> Clip.
- 2) Select the Input & Clip Features as shown below.
- 3) Save your output data in your folder named as “clip.shp” (L:/datalab/<your name>).



4) Uncheck the Geocoding\_JapaneseR layer to see only those locations falling inside of the county boundary.

**Buffer Exercise:** Create a buffer zone around each restaurant with a radius of 1.5 miles to identify the market area for each restaurant.

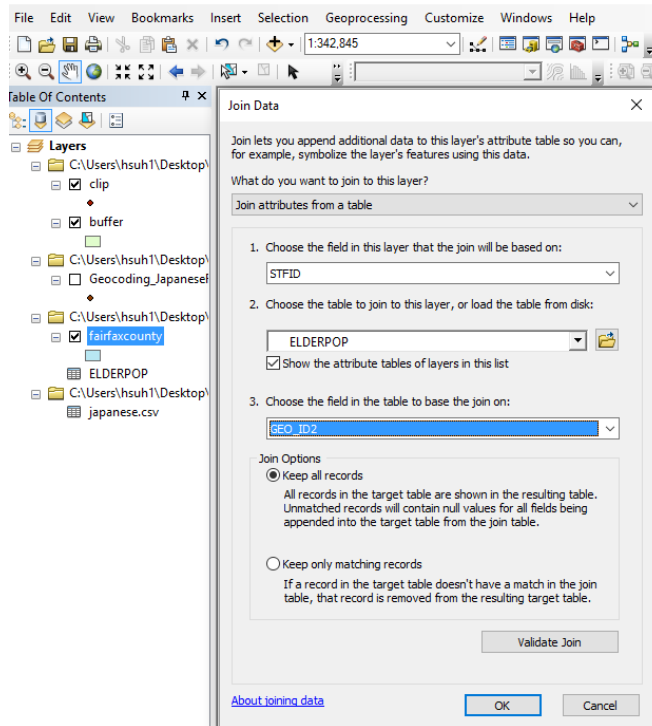
- 1) Click on Geoprocessing -> Buffer.
- 2) Select the Input feature as shown below.



3) The Output feature class should be named 'buffer.shp' and saved in your folder. (L:/datalab/<your name>).

**Table Join Exercise:** Merge Census data to the Spatial Data table and make a thematic map.

- 1) Add ELDERPOP.dbf from your Fairfax county folder to the Table of Content and join this data to the Fairfax County Boundary File using Join (Right click on the FX County File>choose on Join and Relates-> Join)
- 2) Select the fields from both layers that you want to join on (shown below)
- 1) Check whether the Fairfax County Boundary layer contains Elderly population data.

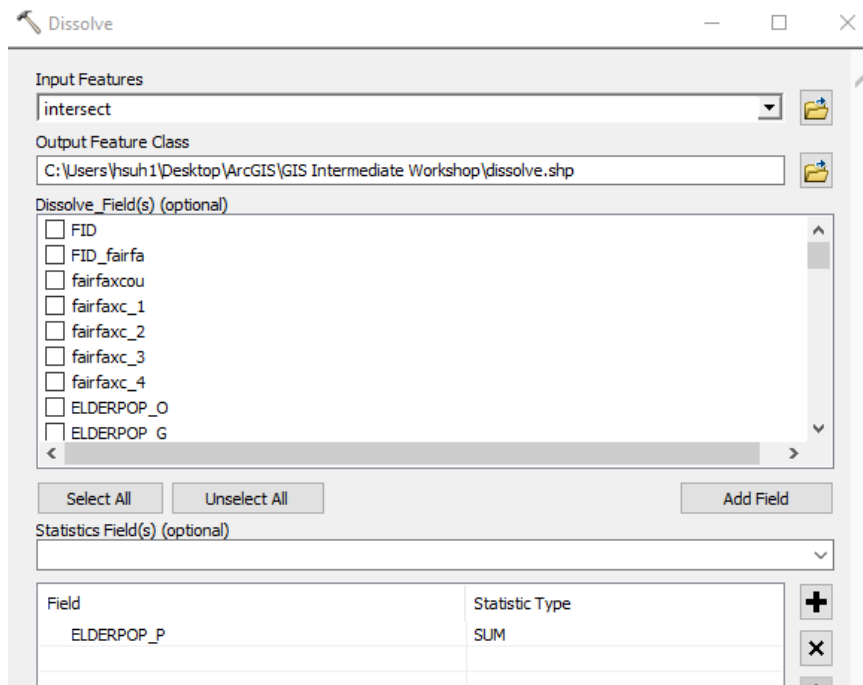


**Intersect Exercise:** Identify Census Tracts which fall into those buffer zones.

- 1) Click on Geoprocessing -> Intersect.
- 2) Select the ' fairfaxcounty.shp' (this now contains elderly population data after the join) and the Buffer.shp.
- 3) Check the intersect data layer (you will see the census tract data associated with each buffer zones).

**Dissolve Exercise:** Dissolve existing buffers by a restaurant name (overlapping buffers into a single buffer) and aggregate or summarize the attribute values of each census tracts falling into each buffer zone.

- 1) Click on Geoprocessing -> Dissolve.
- 2) Select the Input Features as Intersect\_Restaurants.shp and select "Name" in the Dissolve\_Field and Statistics Field as shown below. Click on OK after you are done.

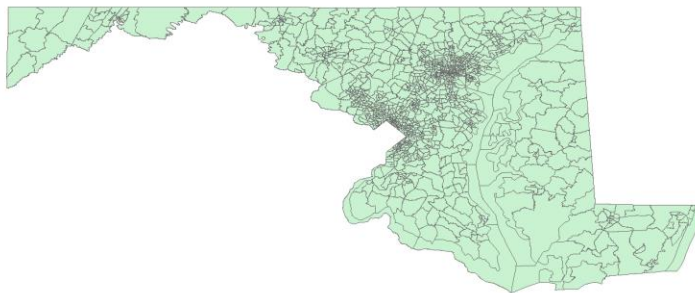
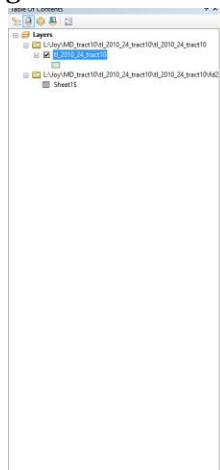


3) Check the output of the table. See which restaurant has the highest market size.

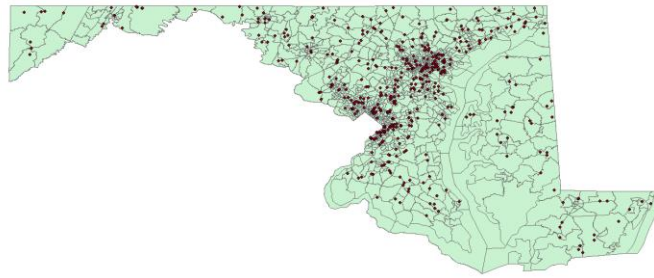
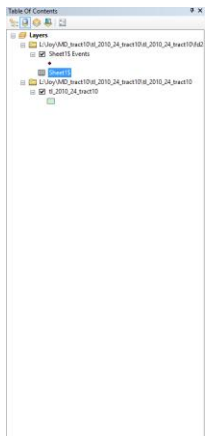
**Spatial Join Exercise:** Join attributes by Location>Count Points in Polygons

**Note:** Start this project with a new data frame (Insert>Data Frame)

1) Add the “tl\_2010\_24\_tract10.shp” file and “fd2010\_xy\_md2.csv” file to a new ArcGIS project using the Add Data button used earlier. The result should look this:

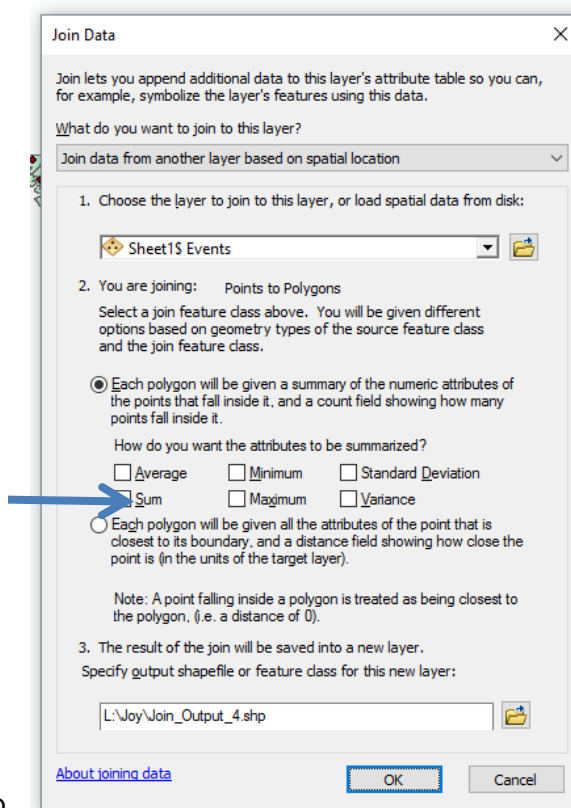


2) Right click on the csv data and select "Display XY Data" and choose a coordinate system ( Let X Field be lon and Y Field be lat for a excel sheet data in case you have). Click on OK. A new layer containing point data gets added to the project. The result should look like this:



**Note:** Right click on this new point layer and Data>Export data and save this as a new name, Traffic\_Accident in your folder when you receive a warning message saying object ids are missing with this newly created point layer

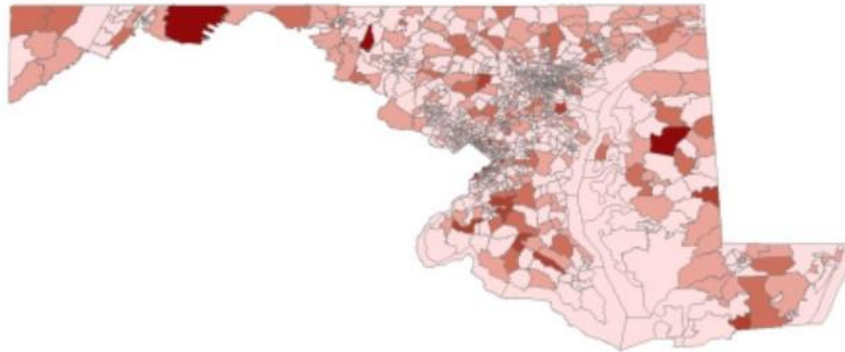
3) Right click on the tl\_2010\_24\_tract10 layer and click on Joins and Relates -> Join. Select the options shown below and save the output to L:/datalab/<your name> - call the layer



Join\_Output. shp.

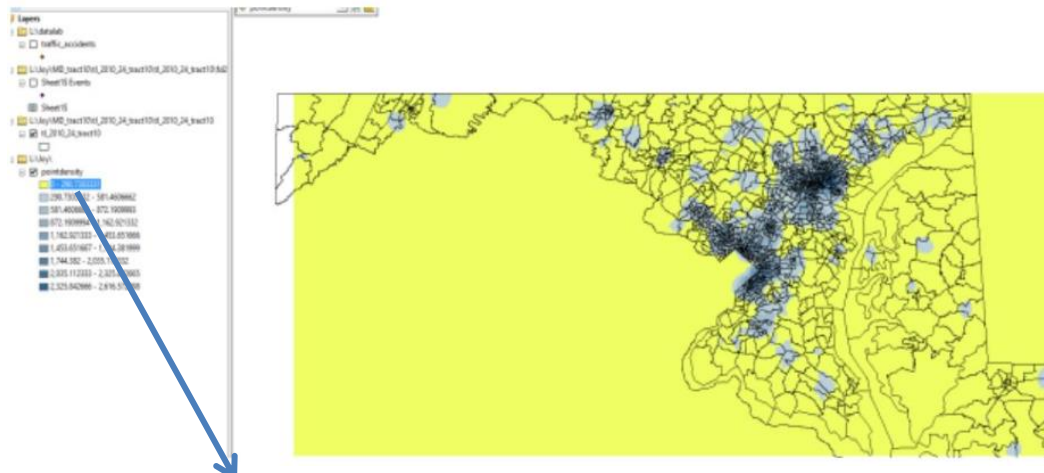
- 2) Open the table of the Join\_Output layer and check a column called “ Count”
- 3) Right Click on the Join\_Output.shp layer and click on Properties.
- 4) Select the Symbology tab and Quantities. Set Value to “Count” and observe the change in Graduated Colors.

You should see a map like the one below that indicates the total number of accidents by color.



**Point Density Exercise:** Create a heat map (convert from a point data to a raster data).

- 1) Click on the “Traffic\_Accidents”
- 2) Go to Tool bar and choose on, Spatial Analyst>Density>Point Density.
- 3) Give the input as Traffic\_Accidents (point data) and Click on Ok.
- 4) You will see the result similar to the below.



- 5) Click on the first category of the data classification and choose a hollow to get rid of background color of the raster area.

**Note:** Add other data available ArcGIS Online Server to your map (such as Highways in MD) to see whether there is a relationship between the traffic accidents and the location of highways.

