**GIS II: Data Management**
**Geocoding Exercise**

*** Files needed for exercise: *MD_SNAP_retailers_2016.dbf, MD_county10_prj_carto.shp*
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**Goals:** The goals of this exercise are to understand the steps in the geocoding process and to practice performing interactive hand geocoding.

**Skills:** After completing this exercise, you will be able to successfully geocode addresses in ArcGIS.

**Geocoding a Table of Addresses**

1. Open a new blank map in ArcMap.

2. Click the **Add Data** button ⬇, browse to the Geocoding Exercise_Data folder and add *MD_SNAP_retailers_2016.dbf*. This dbf lists retailers in Maryland that accept SNAP (Supplemental Nutrition Assistance Program) benefits from the USDA Food and Nutrition Service. If you open the attribute table, you can see that there is address information for 3,999 retailers. All the necessary fields are present: ID, address, city, state, and ZIP code, as well as some additional information such as the name of the retailer.

3. Right click on the table and choose **Geocode Addresses….**
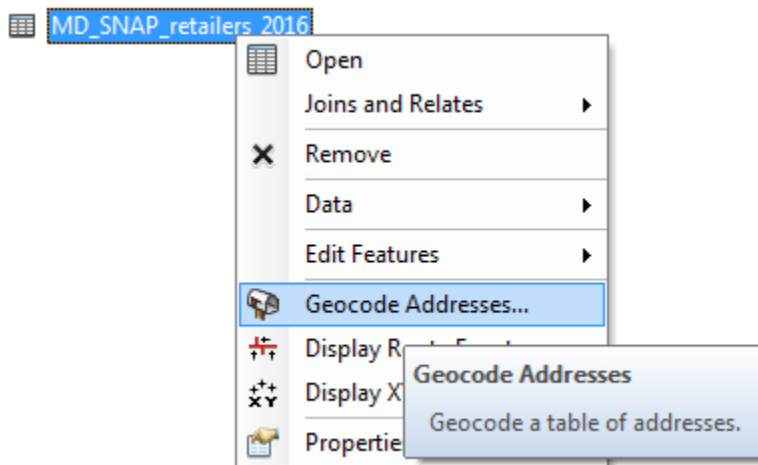


4. You will first need to select an address locator. By default, one or more address locators may be listed, however, you will use a different desktop locator. Click **Add** and browse to the Exercise_Data folder where you will find a folder called "streets" which contains desktop locators. Select the **StreetMapUSA Locator**, and click **Add**.
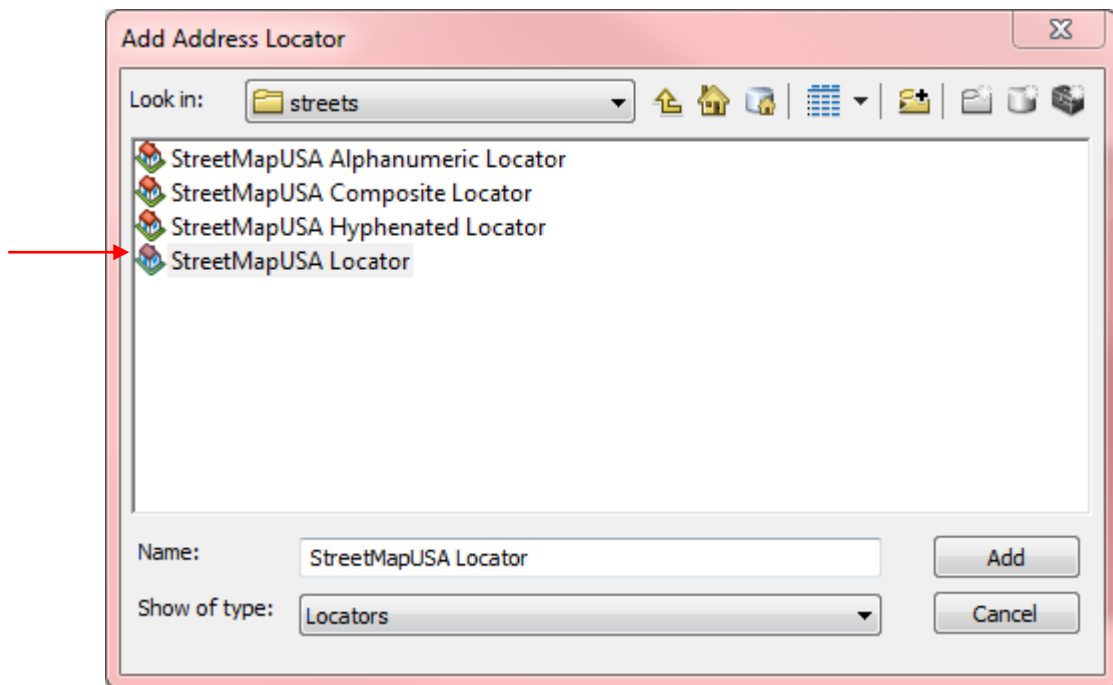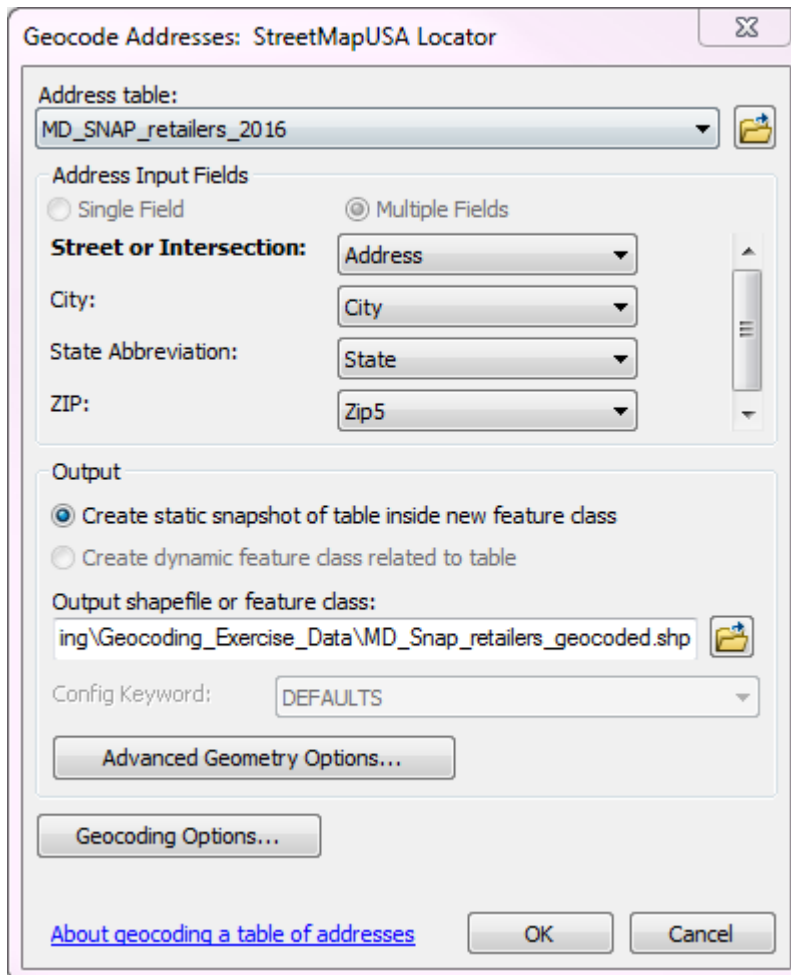
5.  It may take a few seconds for the StreetMapUSA Locator to appear in the list. When it does, select it and click **OK**.
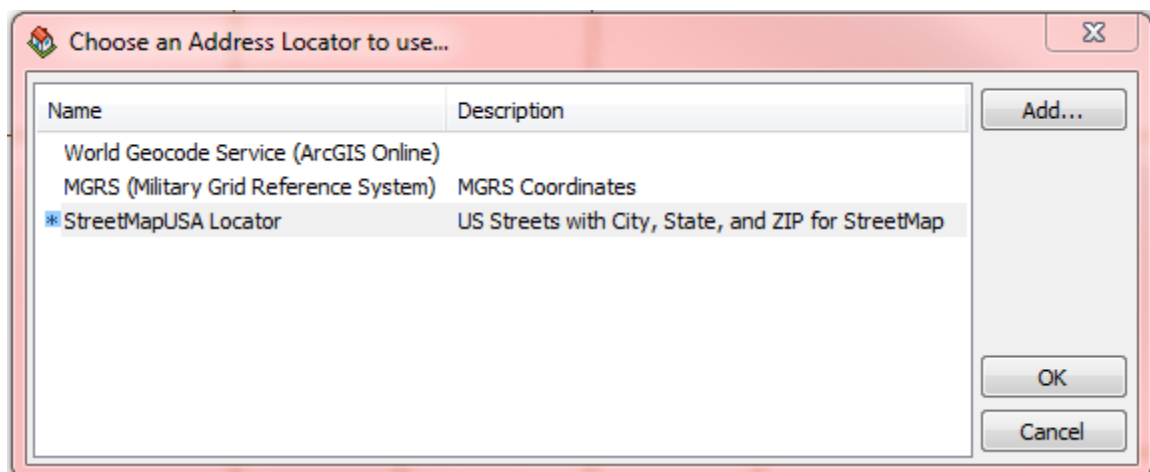


6.  You will now need to specify the fields used for geocoding, as well as the path of the output shapefile. The correct fields should already be filled in for you because they are named appropriately, but double check. Make sure your output file is named something logical, NOT Geocoding_Result.shp, and is saved in your Exercise_Data folder for this module.

7. Click the button for **Geocoding Options**. Leave the default **spelling sensitivity** at 80 and **minimum candidate score** at 10. Make sure that the **minimum match score** is set to 100. Uncheck the box for **match if candidates tie** since this is not recommended. Check the box for **X and Y coordinates** to have latitude/longitude coordinates automatically generated in the geocoding process.

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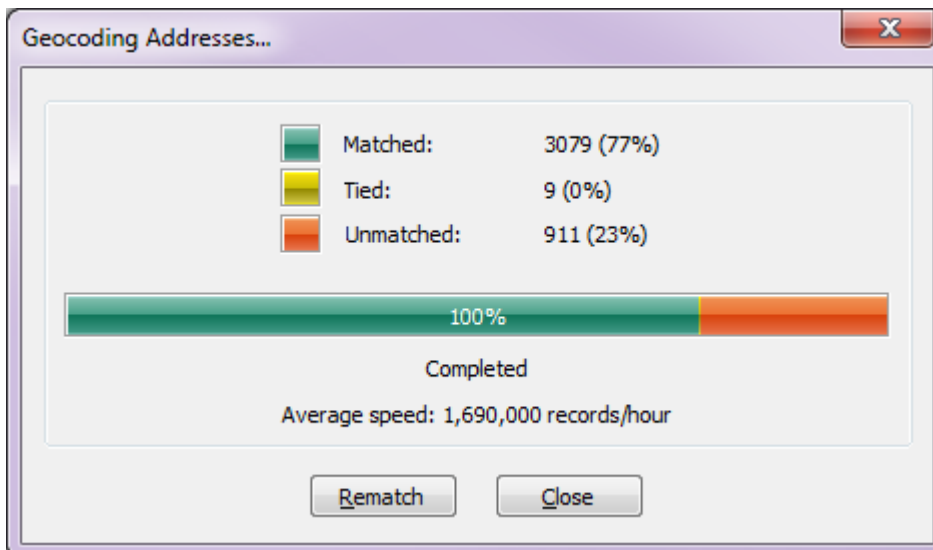


8. Click **OK** to exit the geocoding options, then click **OK** to run the geocoder.



9. When the window shows that the geocoding is complete, click **Close** and your resulting geocoded points will be added to the map as a new layer.
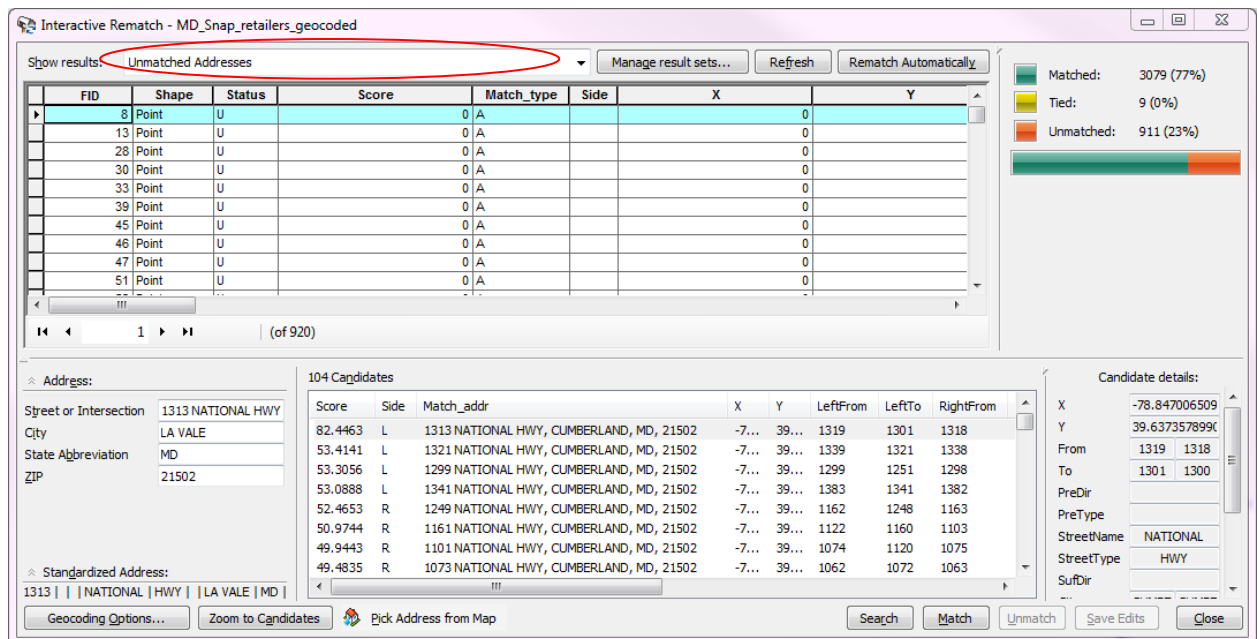
10. If you open up the attribute table, you can see the results. In the **Status** field, M is a matched record, T is a tie, and U is an unmatched record. You might notice that some of these unmatched records are missing information or have errors in the address. You will try to match them by hand. Close the table.

11. Turn on the Geocoding toolbar by going to **Customize > Toolbars > Geocoding**. Make sure you have your geocoding results layer selected in your Table of Contents, and that you are using the correct address locator, StreetMapUSA Locator. Click on the last button on the Geocoding toolbar, **Review/Rematch Addresses**.



12. On the **Interactive Rematch** screen, select **Unmatched Addresses** from the **Show results** dropdown menu. We will try and match some of these addresses by hand.



13. To help orient yourself, you can add a street layer for reference. Click Add Data and in the same folder where you found the address locator, add the street network: ⊞ streets . You want to add all feature classes to the map, and turn off everything except SDC Edge Source.

14. Start with the record with FID 8, Dollar General 0874. There are candidates, but none of them has a score of 100. Search Google Maps for the original 1313 National Hwy, La Vale, MD 21502. It looks like there is a Dollar General at the address specified in the SNAP retailers table.
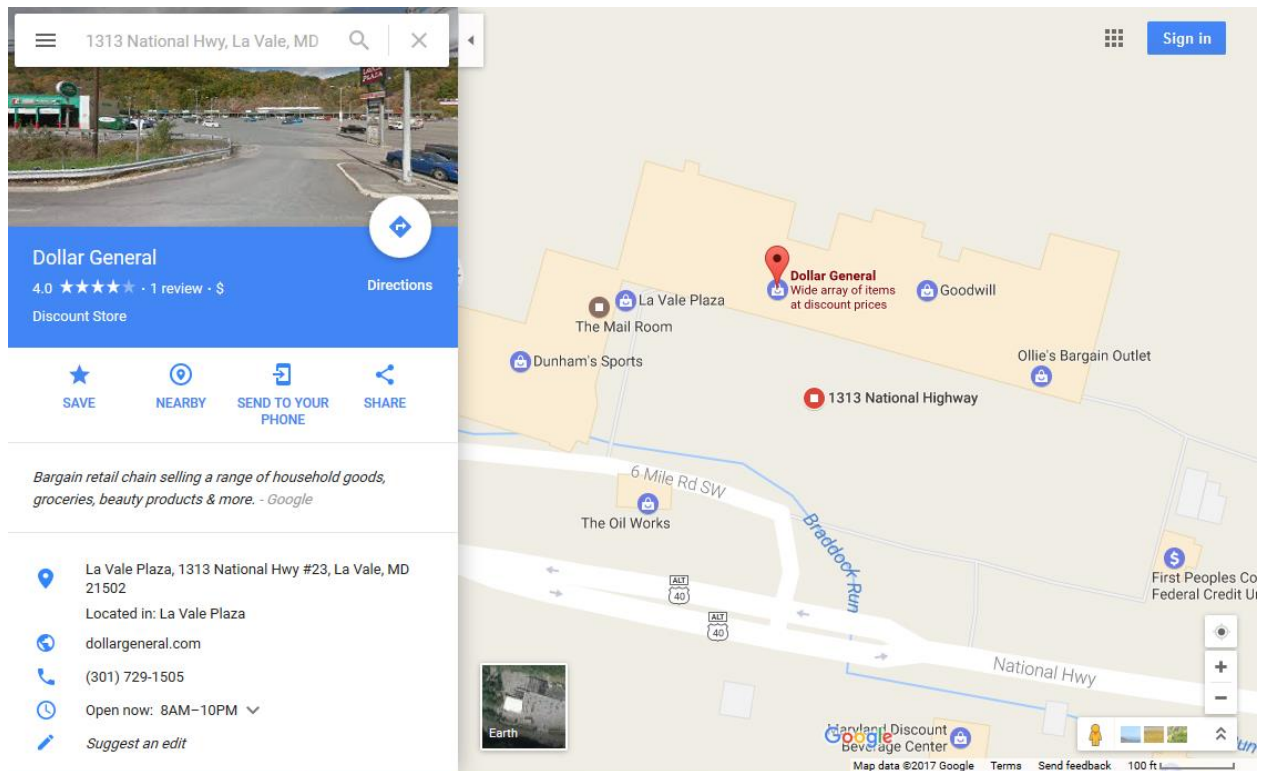
15. In the Interactive Rematch screen, select the first candidate and click Zoom to Candidates. This candidate has a different City, but let's take a closer look. If we note the location of the yellow dot – this is the location of the candidate selected. Light blue dots are other candidates in the list. You can us the identify tool  to identify the nearby streets or right click on the SDC Edge Source layer and select **Label Features**. It looks like the selected candidate is very close to the actual location. The differences in City could be the result of inaccuracies with our reference data set or because of a change in City boundaries (our reference data set is from 2006). Select the candidate and click the **Match** button.

16. Notice that the table of unmatched addresses has been updated with a new status, X/Y, and match address for this record, and the unmatched count decreased from 911 to 910.

17. Move to the next address, FID 13 (Rite Aid 104). This address has a good candidate. Why was this address not matched? Click **Match** to resolve the issue.

18. Now, select the record with the FID 28 (Lindemann's Apiary at Gay & Saratoga Streets). We can see there is a candidate for this intersection, with a Score of 66. Intersections can be geocoded as well, but will rarely have a score of 100.

19. Select this candidate and click the **Match**. The information for this record is updated.

20. Notice again that the table of unmatched addresses has been updated with a new status, X/Y, and match address for this record, and the unmatched count decreased.

21. Next, select the record with FID 30. There are no candidates for this address. If we look at the Store_Name for this record, we can see it is Rite Aid 11199 in Prince Frederick, MD.

22. Search Google for Rite Aid in Prince Frederick, MD. Google has this store at the same address
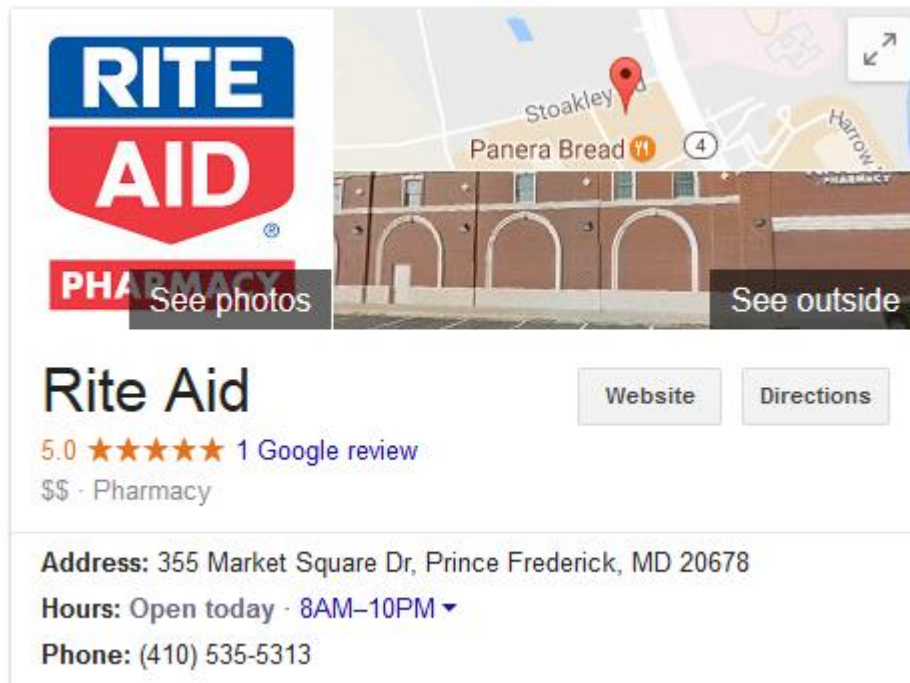


23. This address does not exist in our reference dataset. Not all addresses are going to match during the geocoding process. We could try to place this point manually, but it is also OK to leave unmatched addresses.

24. Spend a few minutes trying to match other unmatched addresses. Note that some addresses may be impossible to match if they are missing key information such as a street number.

25. You can easily see how rematching all unmatched records could take a significant amount of time. If you have a lot of unmatched records, standardizing and then running the process again may pick up many additional matches. If you have time, you can run the standardization tool. Please reference the "Batch 2" section in CEHI's Geocoding Best Practices 2015, located in the Resources folder on Box.

26. Click **Close** to exit the Interactive Rematch. Addresses you geocoded using the interactive rematch process will be added to your results layer automatically.

27. Edit the metadata for this file to document your geocoding process. Open the Item Description for your geocoding results layer by right clicking on the layer and going to **Data > View Item Description**. Click the **Edit** button. Enter in a summary, description, credits, and use limitation. In this case, there would be no use constraints because the data is not confidential. Make sure to note the data source, original number of records, match percent, address locator used, and your contact information.

28. Once your metadata is up to date, add the *MD_county10_prj_carto.shp* shapefile from the Exercise_Data folder. You may be able to see that the coordinate system is not correct. What would make you think this? Fix your coordinate system, and create a quick layout for your geocoded points.