



SUR6943

Geographic Information Systems

GRADUATE PROJECT BY:

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OBJECTIVE:

01

Objective 1:
Geocode and map
client data for
target product

02

Objective 2:
Visualize the
average annual
income per unit per
zip code and/or per
county

03

Objective 3: Identify
target location to
market product
based on maximum
income produced

DATA

Historical client data for product to be marketed

State boundary data

County boundary data

Zip code boundary data

CLIENT DATA

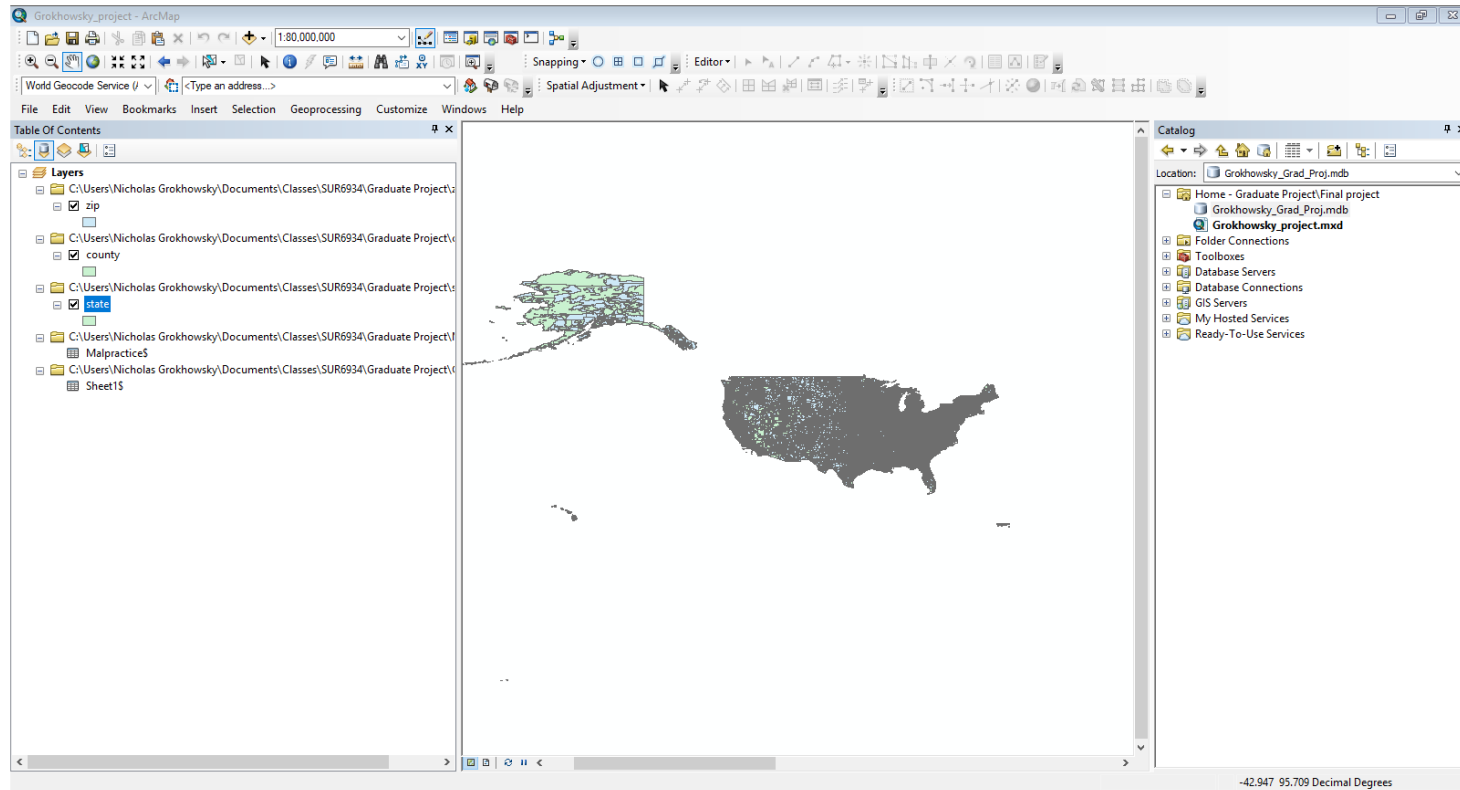
- ▶ Identify agency's target product to market
 - ▶ Malpractice insurance carrier 'B' dataset
 - ▶ Street Address, City, State, and Zip code
 - ▶ Income generated per client
 - ▶ Home insurance carrier 'A' dataset
 - ▶ Street Address, City, State, and Zip code
 - ▶ Income generated per client
 - ▶ Replacement value per dwelling

BOUNDARY DATA

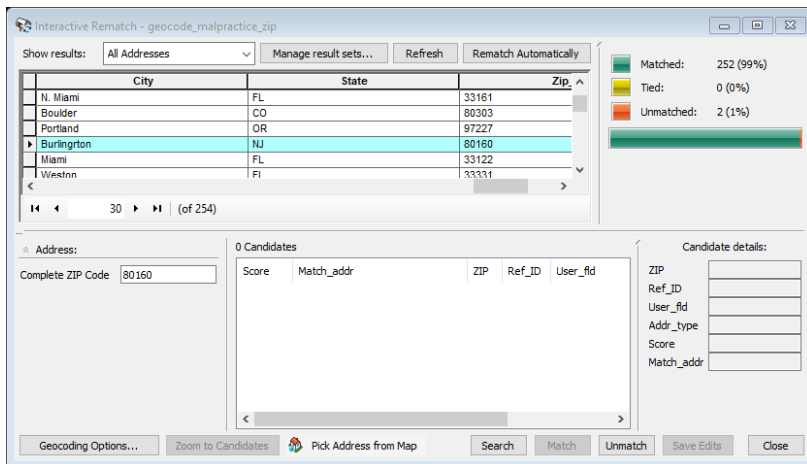
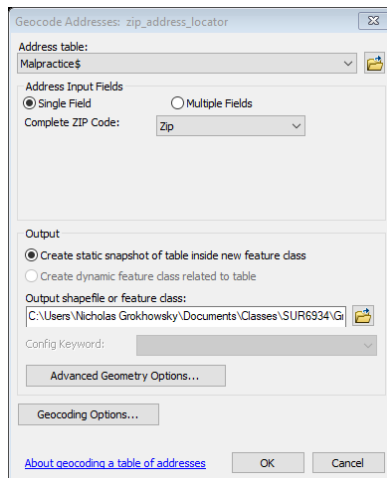
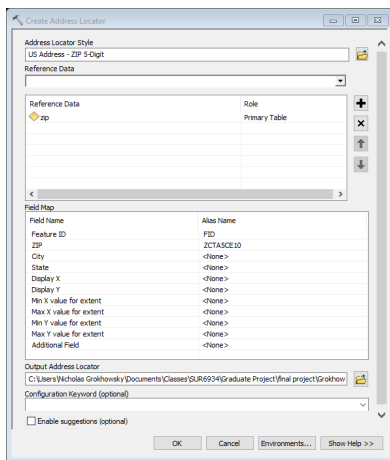
- ▶ State boundary data from US Census Bureau
 - ▶ https://www.census.gov/geo/maps-data/data/cbf/cbf_state.html
- ▶ County boundary data from US Census Bureau
 - ▶ https://www.census.gov/geo/maps-data/data/cbf/cbf_counties.html
- ▶ Zip code boundary data from US Census Bureau
 - ▶ https://www.census.gov/geo/maps-data/data/cbf/cbf_zcta.html

CRITERIA

Data	Start with state boundaries, county boundaries, zip code boundaries, and client datasets
Address Locator	Create an address locator based on five digit zip codes
Geocode	Geocode client data to the zip code address locator
Join	Join geocoded client data to zip code polygons and county polygons based on average client data per polygon
Symbology	Change symbology for each new joined data set to show lowest average income to highest average income per county and zip code



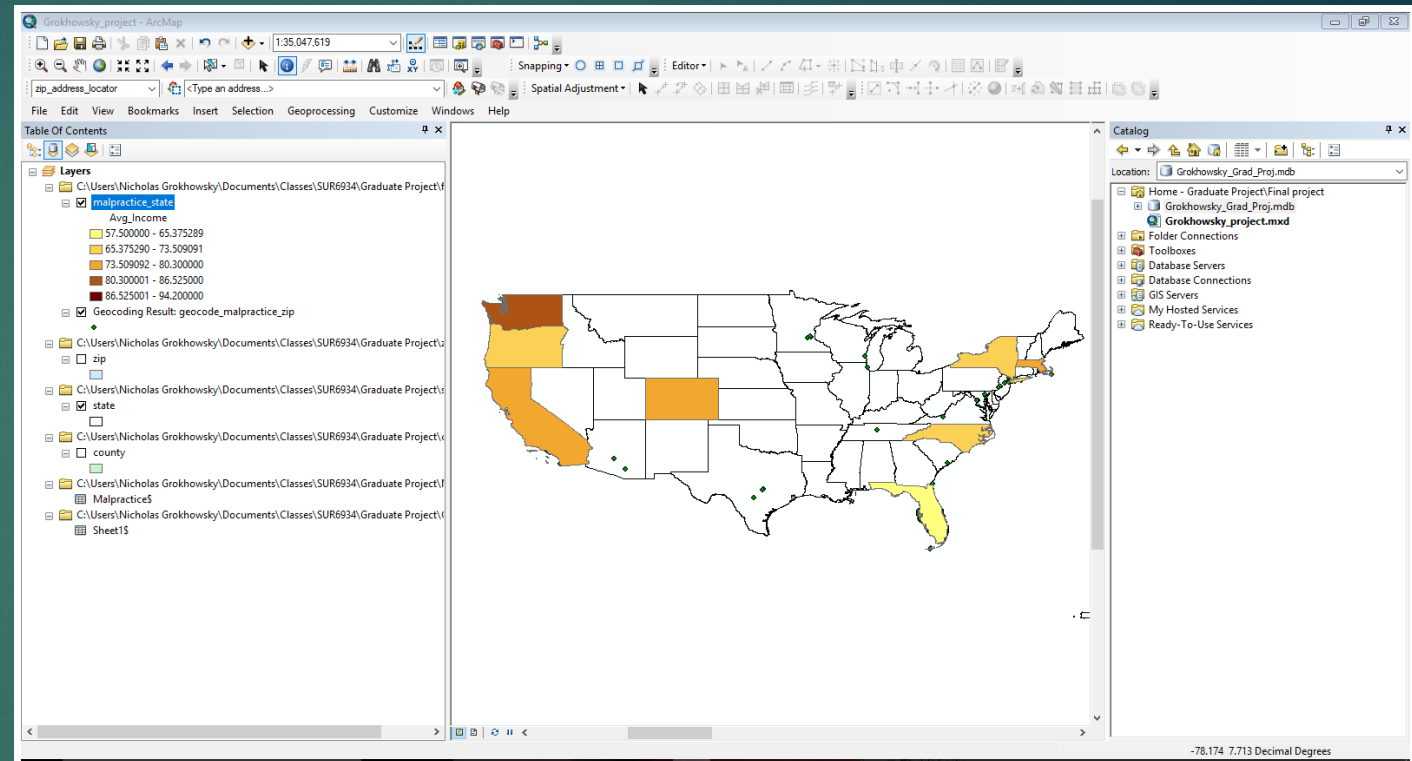
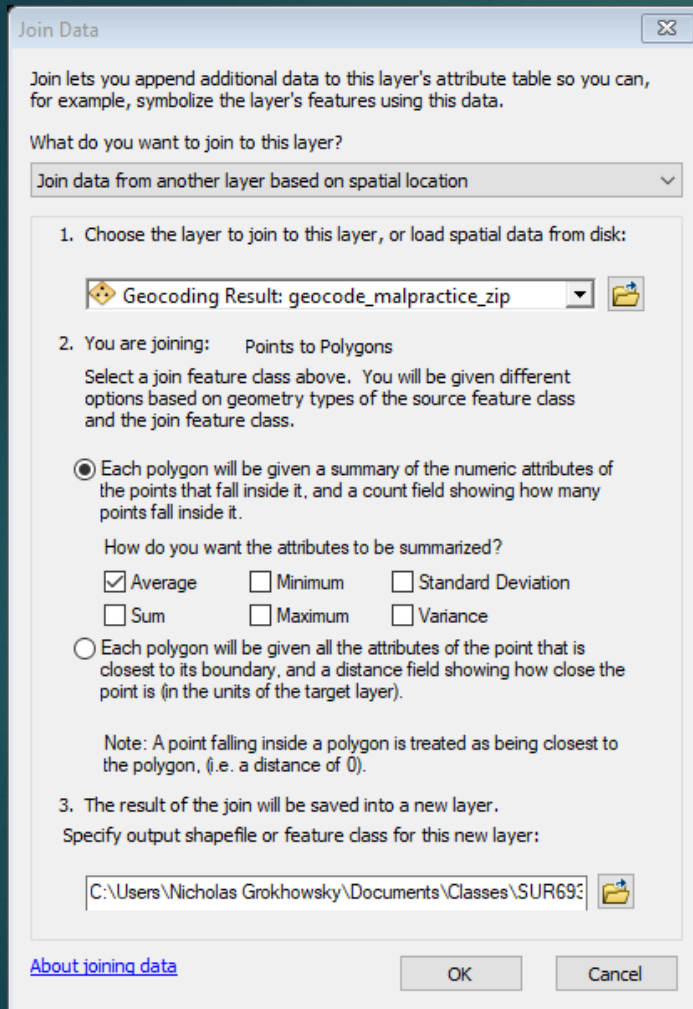
DATA – MALPRACTICE CLIENTS



GEOCODING CLIENT DATA

- Create address locator based on zip codes
- Geocode malpractice clients to new address locator
- Correct unmatched points

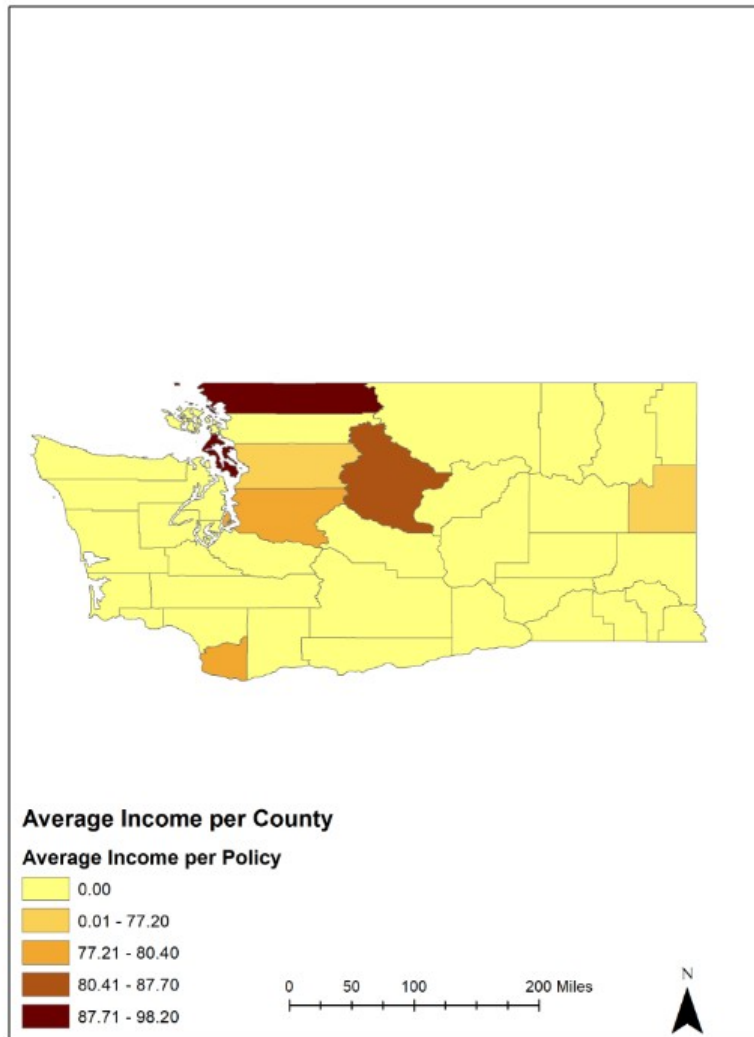
JOINING GEOCODED POINTS TO STATE POLYGONS



After joining the geocoded points for malpractice clients to state polygons the symbology was changed, label values were set to two decimal places, and all polygons with average income equal to zero and count less than five were excluded.

FINAL MALPRACTICE MAP

- After identifying that Washington state is the most profitable state for malpractice insurance I analyzed the counties within the state
- After clipping the data at Washington state, one county was identified as the most profitable county in the state, and therefore the most profitable county in the country for this product
- The conclusion of this information is that Whatcom county should be the focus of the next marketing campaign for this malpractice insurance product



CRITERIA

Start with state boundaries, county boundaries, zip code boundaries, and client datasets

Create an address locator based on five digit zip codes

Geocode client data to the zip code address locator

Join geocoded client data to zip code polygons and county polygons based on average client data per polygon

Project joined dataset for grouping of attributes

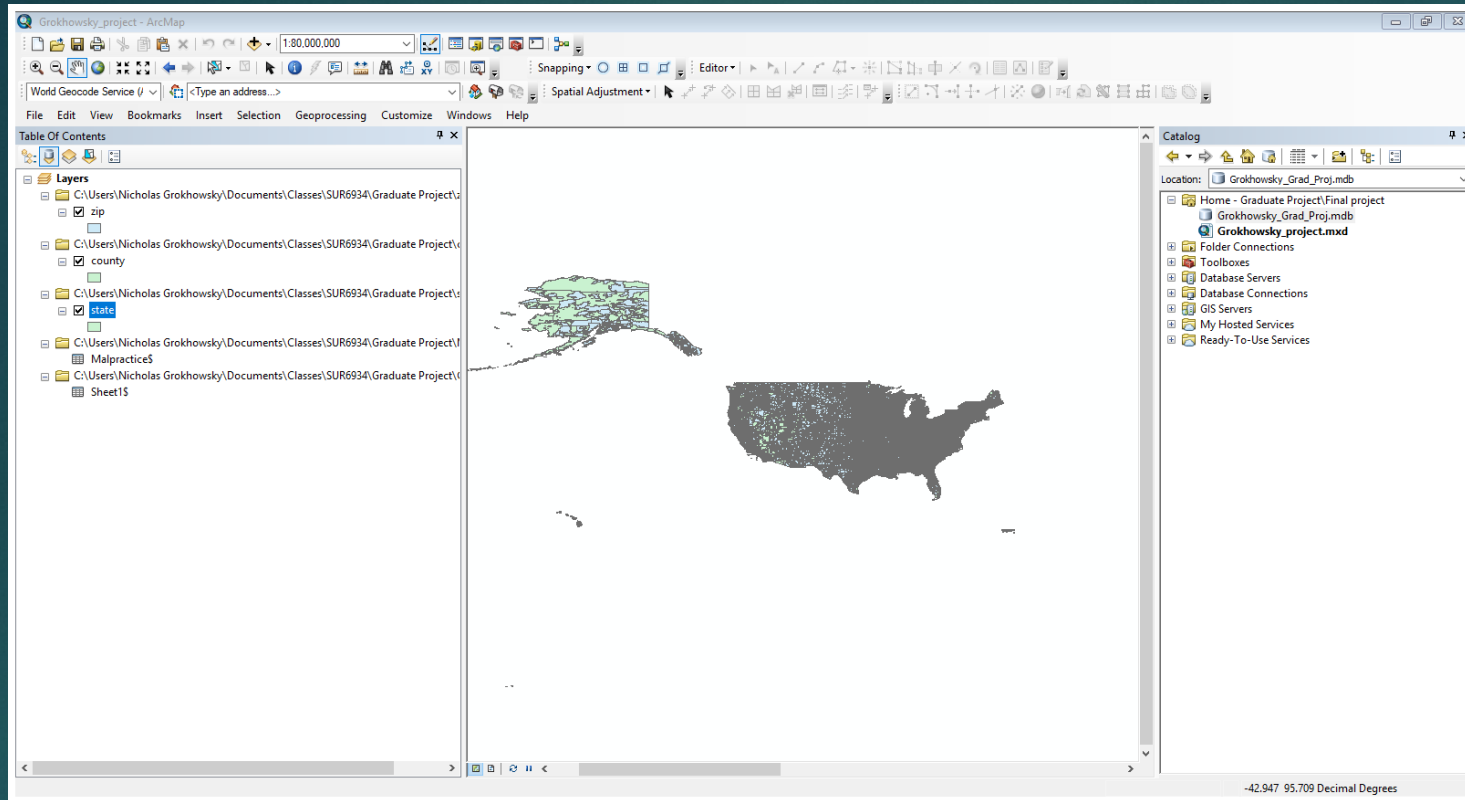
Change symbology for each new joined data set to show lowest average income to highest average income per county and zip code

Group attributes to be studied

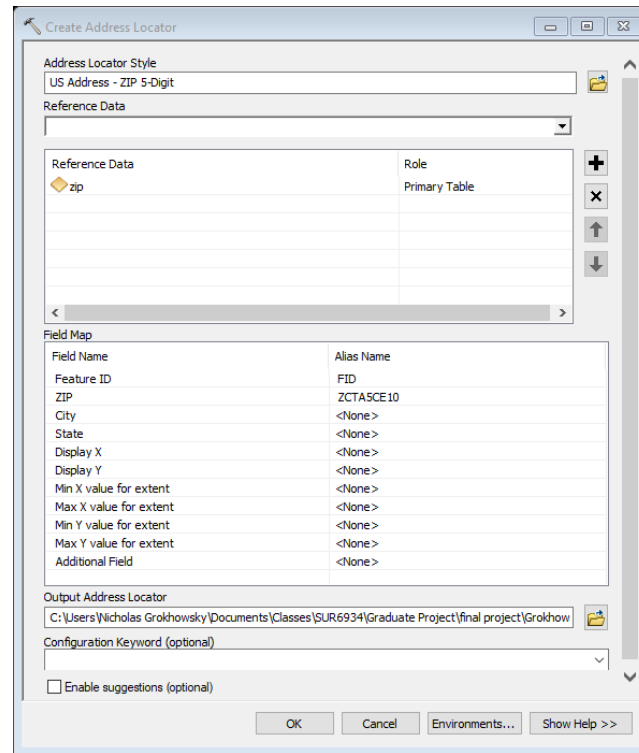
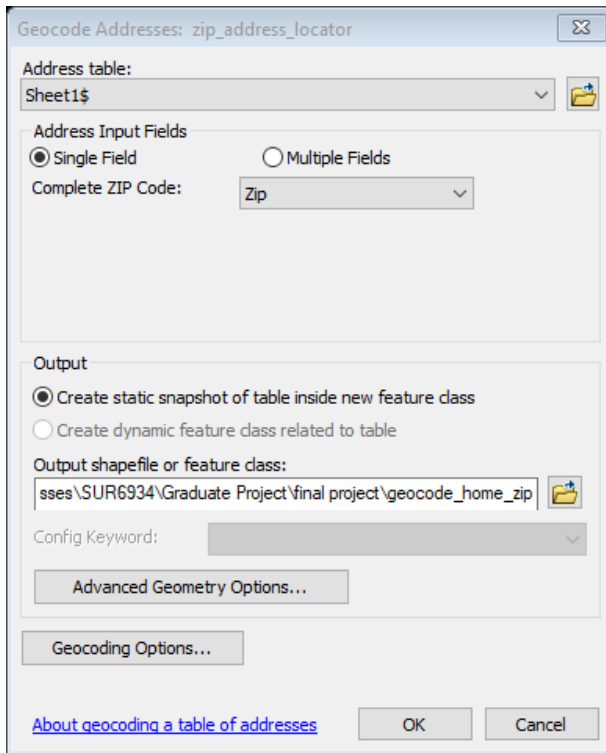
Buffer location of agency

Intersect buffer by group

Identity of zip codes within buffer



DATA – HOME INSURANCE CLIENTS



GEOCODING CLIENT DATA

- Geocode home insurance clients to new address locator
- Correct unmatched points

JOINING GEOCODED POINTS TO ZIP CODE POLYGONS

Join Data

Join lets you append additional data to this layer's attribute table so you can, for example, symbolize the layer's features using this data.

What do you want to join to this layer?

Join data from another layer based on spatial location

1. Choose the layer to join to this layer, or load spatial data from disk:

Geocoding Result: geocode_home_zip

2. You are joining: Points to Polygons

Select a join feature class above. You will be given different options based on geometry types of the source feature class and the join feature class.

Each polygon will be given a summary of the numeric attributes of the points that fall inside it, and a count field showing how many points fall inside it.

How do you want the attributes to be summarized?

Average Minimum Standard Deviation
 Sum Maximum Variance

Each polygon will be given all the attributes of the point that is closest to its boundary, and a distance field showing how close the point is (in the units of the target layer).

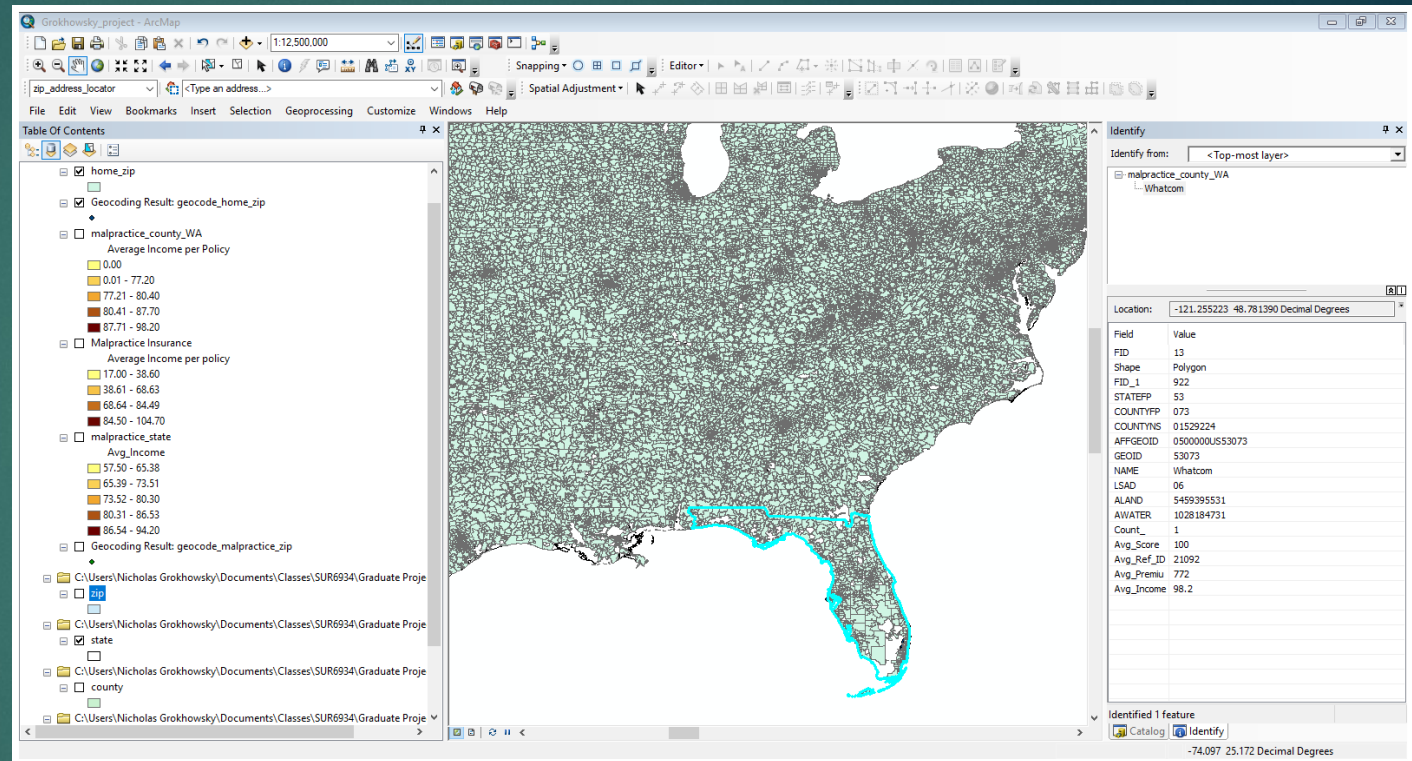
Note: A point falling inside a polygon is treated as being closest to the polygon, (i.e. a distance of 0).

3. The result of the join will be saved into a new layer.

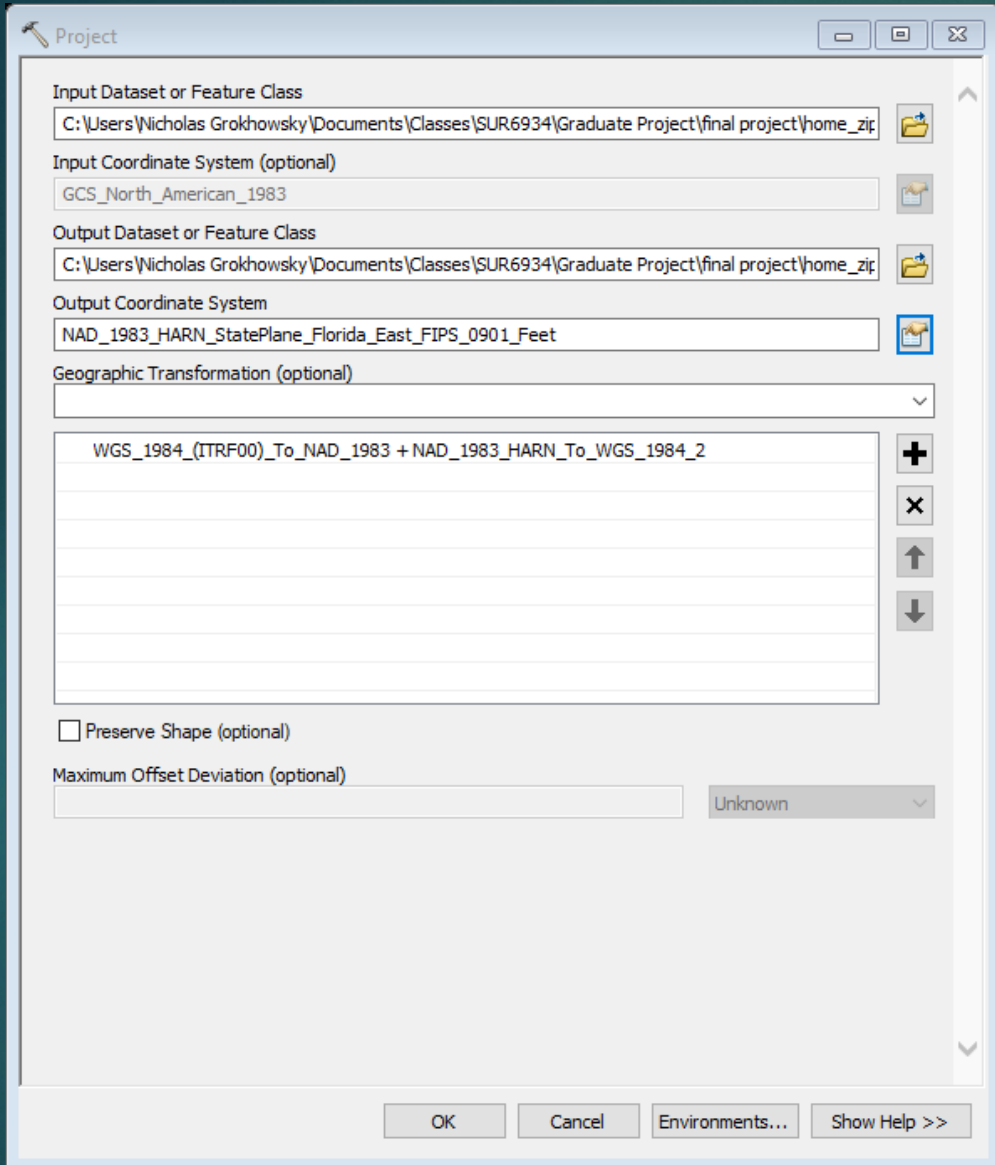
Specify output shapefile or feature class for this new layer:

s:\Classes\SUR6934\Graduate Project\final project\home_zip

[About joining data](#) OK Cancel

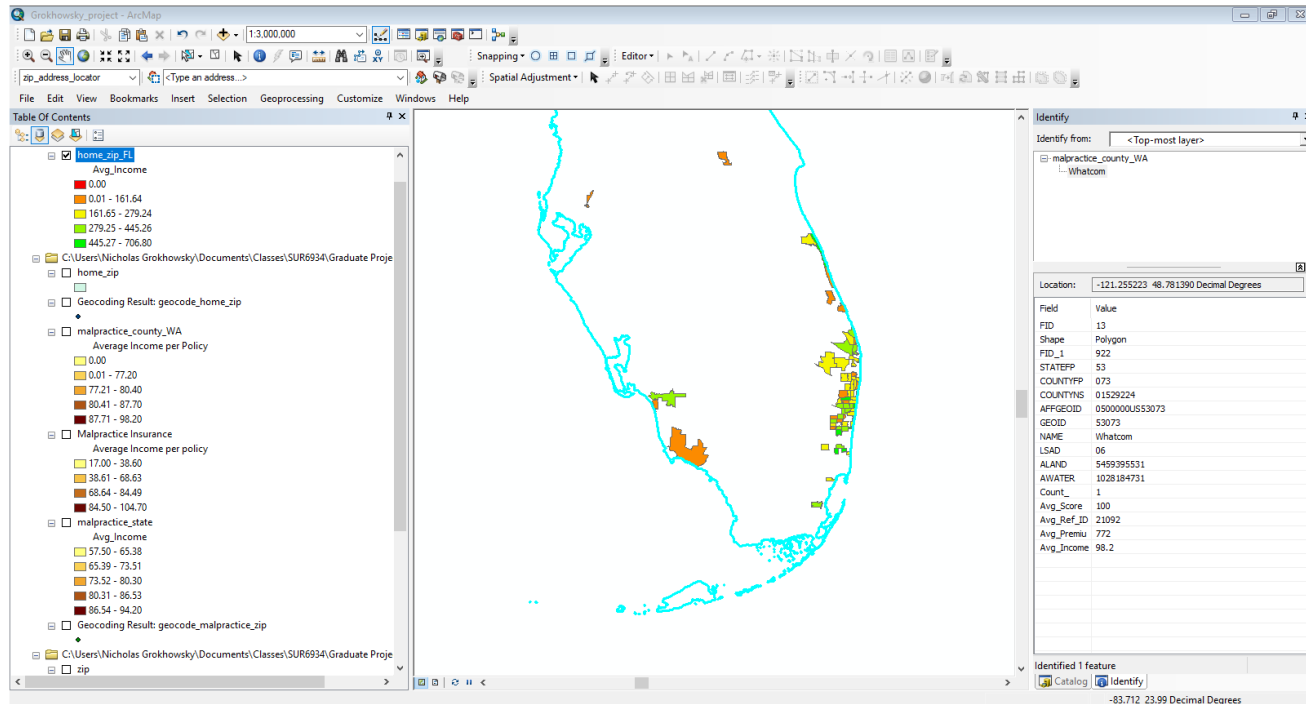


After joining the geocoded points for home insurance clients to zip code polygons the data was clipped to keep only Florida zip codes



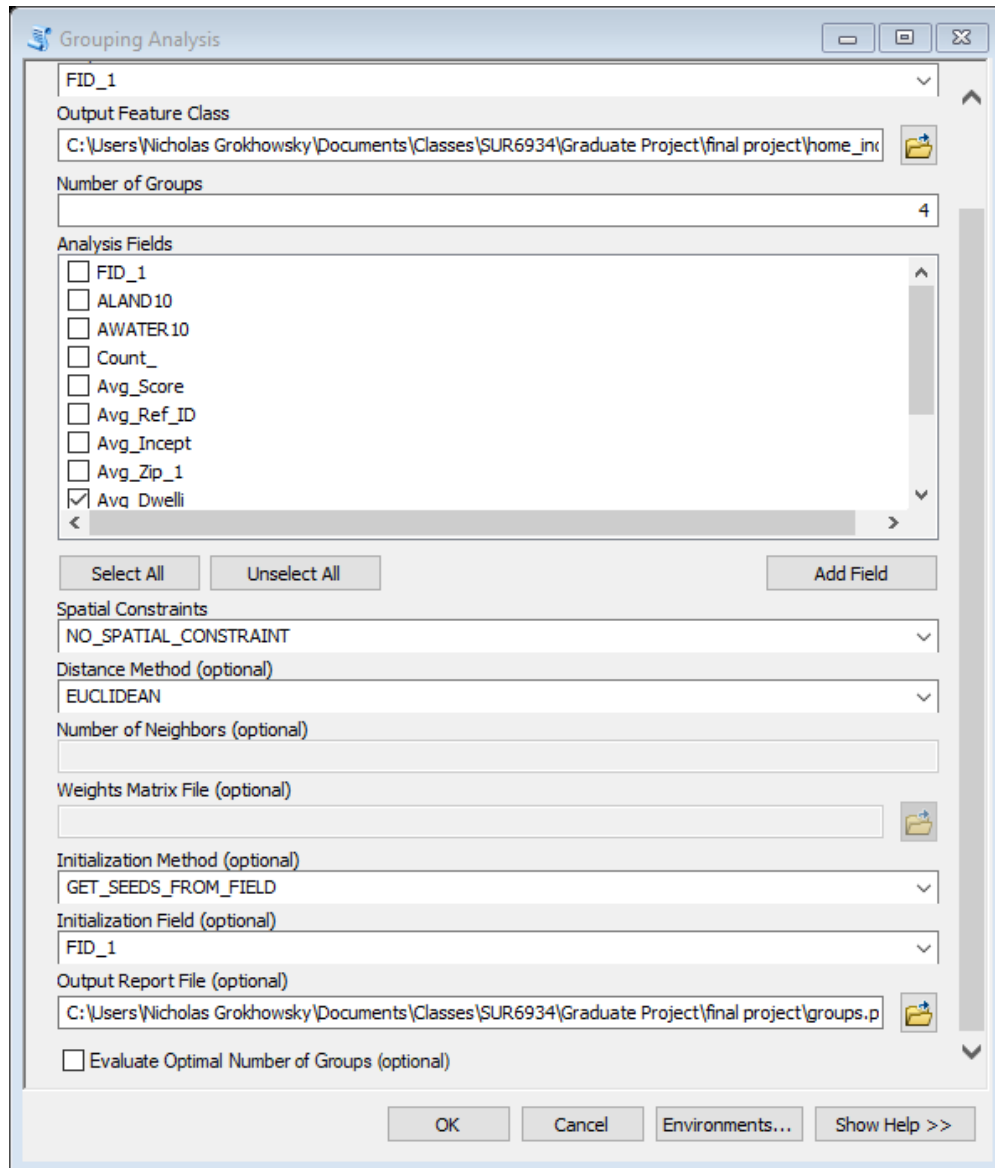
PROJECT DATA FOR GROUPING ANALYSIS

Project data in ArcCatalog -> ArcToolbox in order to group attributes accurately



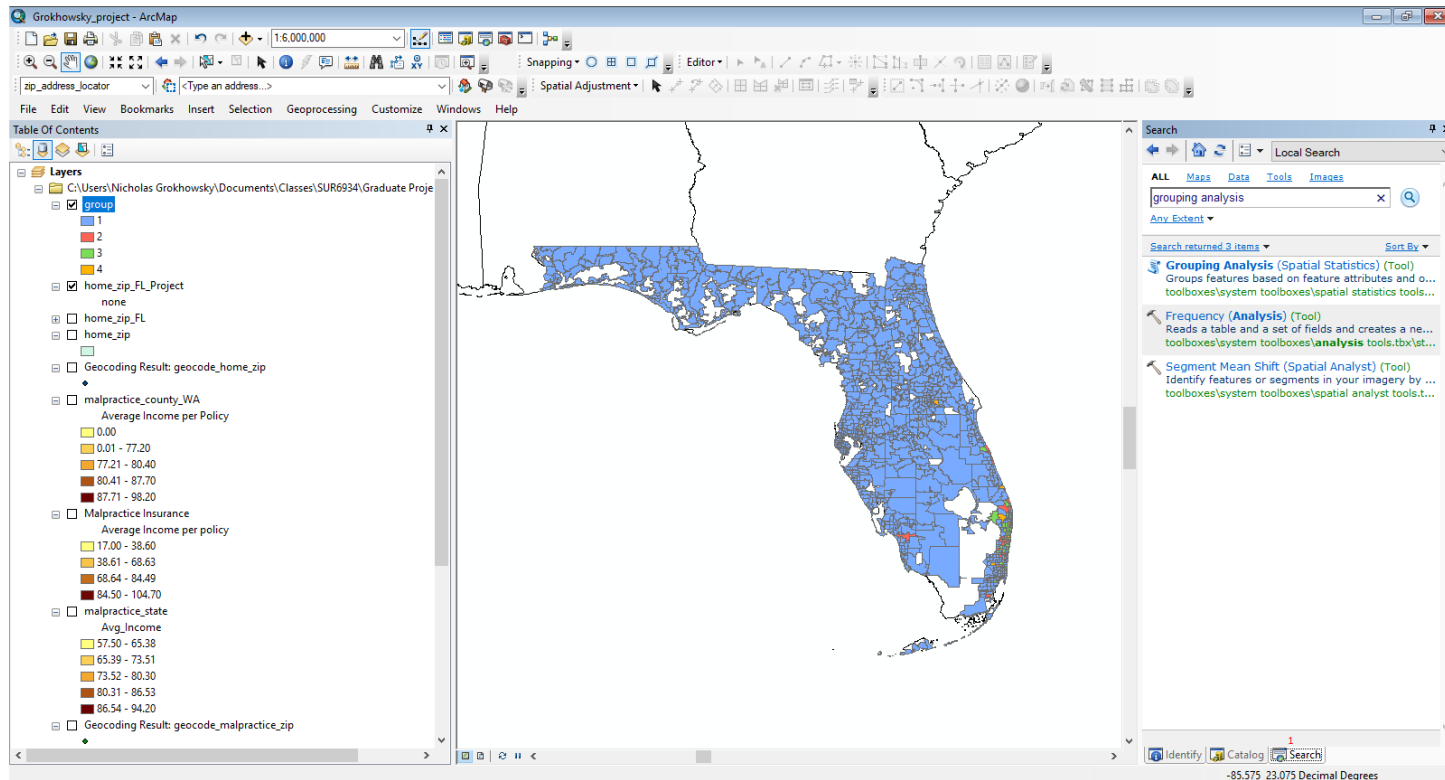
CHANGE SYMBOLOGY

The label values were set to two decimal places, and all polygons with average income equal to zero were excluded



GROUPING ANALYSIS

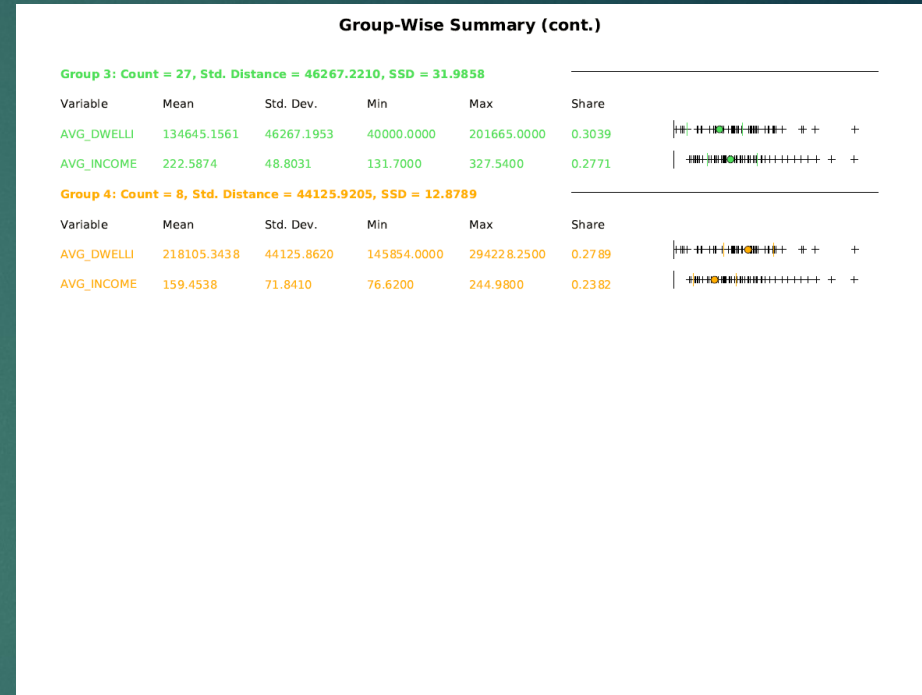
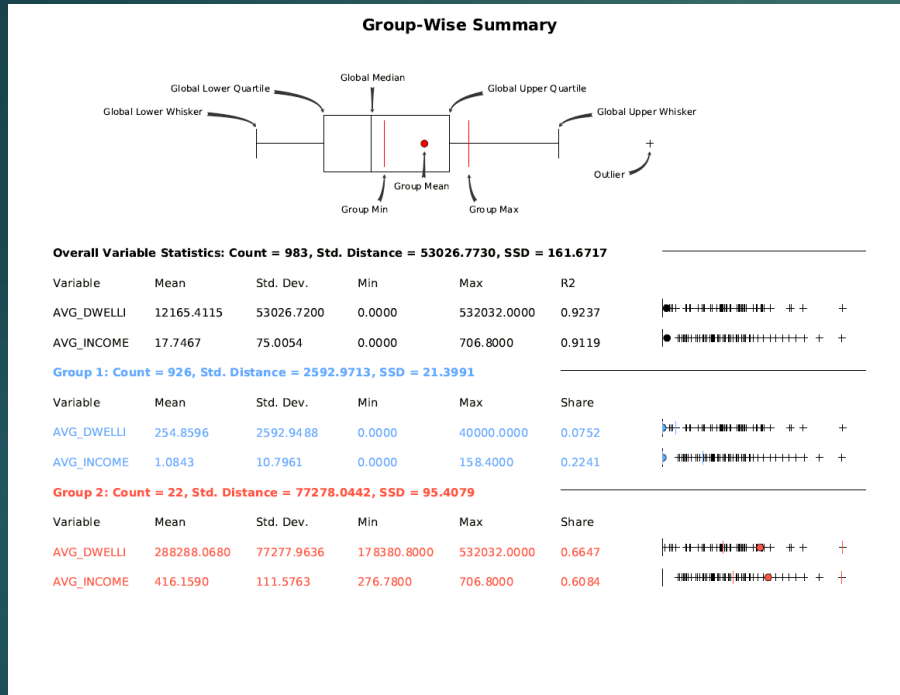
Average dwelling and average income are grouped



GROUPING ANALYSIS

Average dwelling and average income are grouped

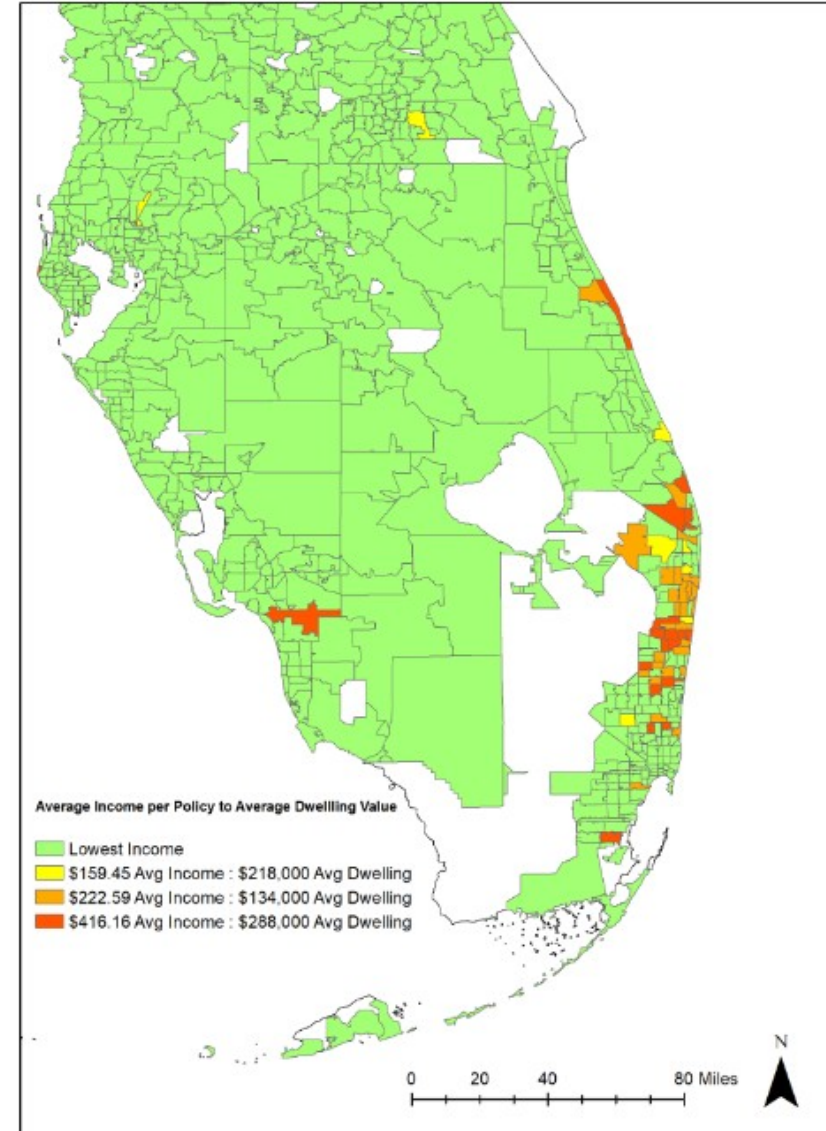
GROUP-WISE SUMMARY



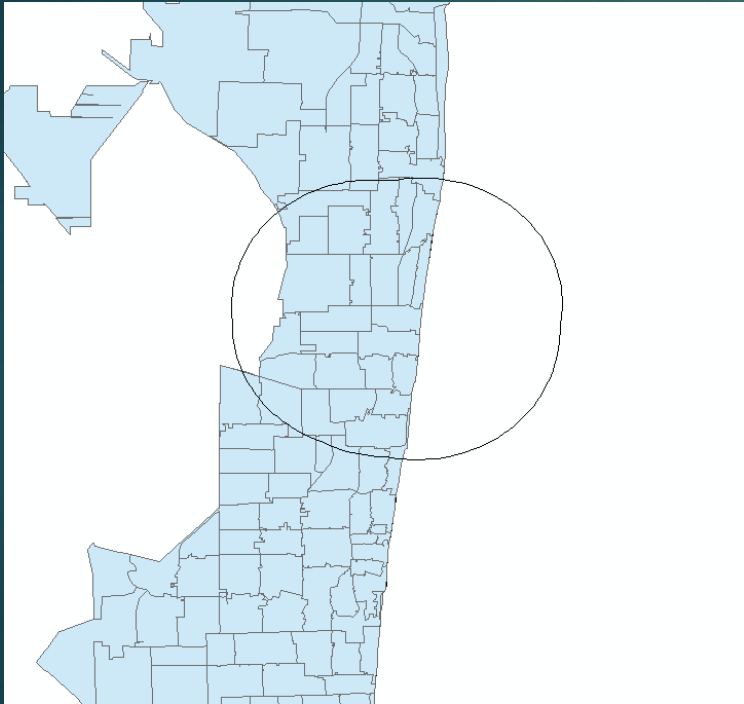
The group-wise summary was created in order to identify the groups on the map

FINAL HOME INSURANCE MAPS

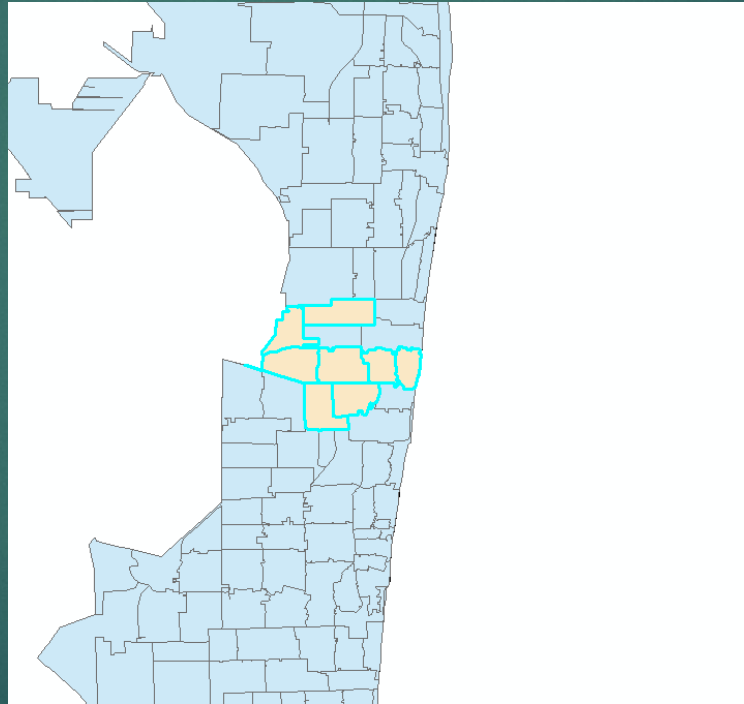
- ▶ After grouping the average income and average dwelling value per zip code the color and labels were changed for each group
- ▶ We see our target dwelling values within the most profitable zip codes in group 2 – highlighted in red
- ▶ To further this analysis one additional map will be created that identifies the red colored zip codes (group 2) within a fifteen mile buffer around the office's zip code



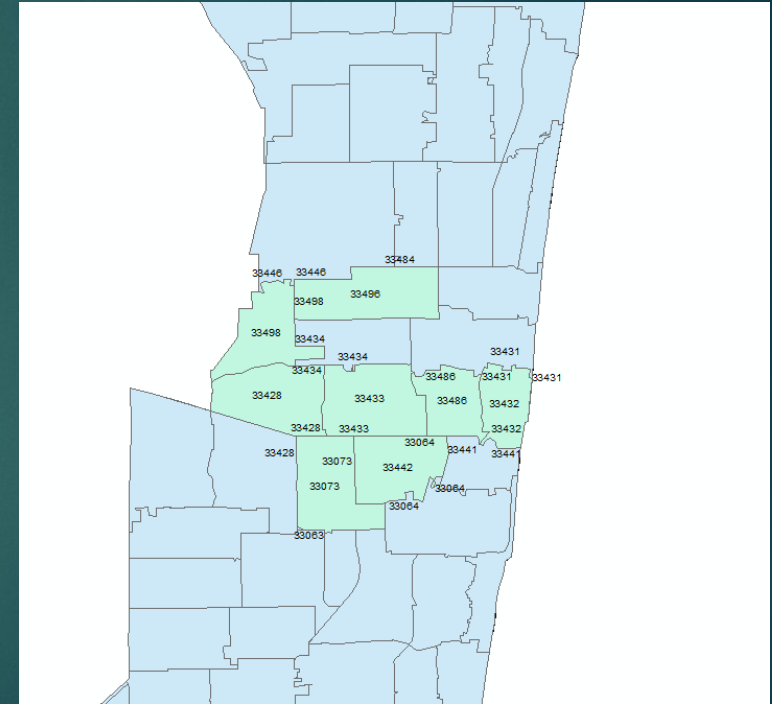
CREATE BUFFER



INTERSECT



IDENTITY



FINAL HOME INSURANCE MAPS

- ▶ After creating a fifteen mile buffer from the zip code the agency is located in (33487), intersecting the buffer with the high income group, and then creating an identity between the intersect and zip codes we now have seven targeted high income zip codes
- ▶ The conclusion of this study is that homes with replacement values of \$288,000 in these seven zip codes are the most profitable zip codes to market for this home insurance carrier's product

