Your Name = [Ankila Kumari] *GIS 5555 Basic Spatial Analysis*

internet_id = [kuma0389]

Time_Spent = [60 mins] (after-class)

[Windows+Shift+S for screenshot of your analysis]

[Fill the above-listed info and then submit the completed document in Canvas (try to include all analysis results that can help reflect your workflow and thoughts, i.e., images, information about data, your statements, etc.)]

Assignment for Lab 2b

"EDA 2: Variables"

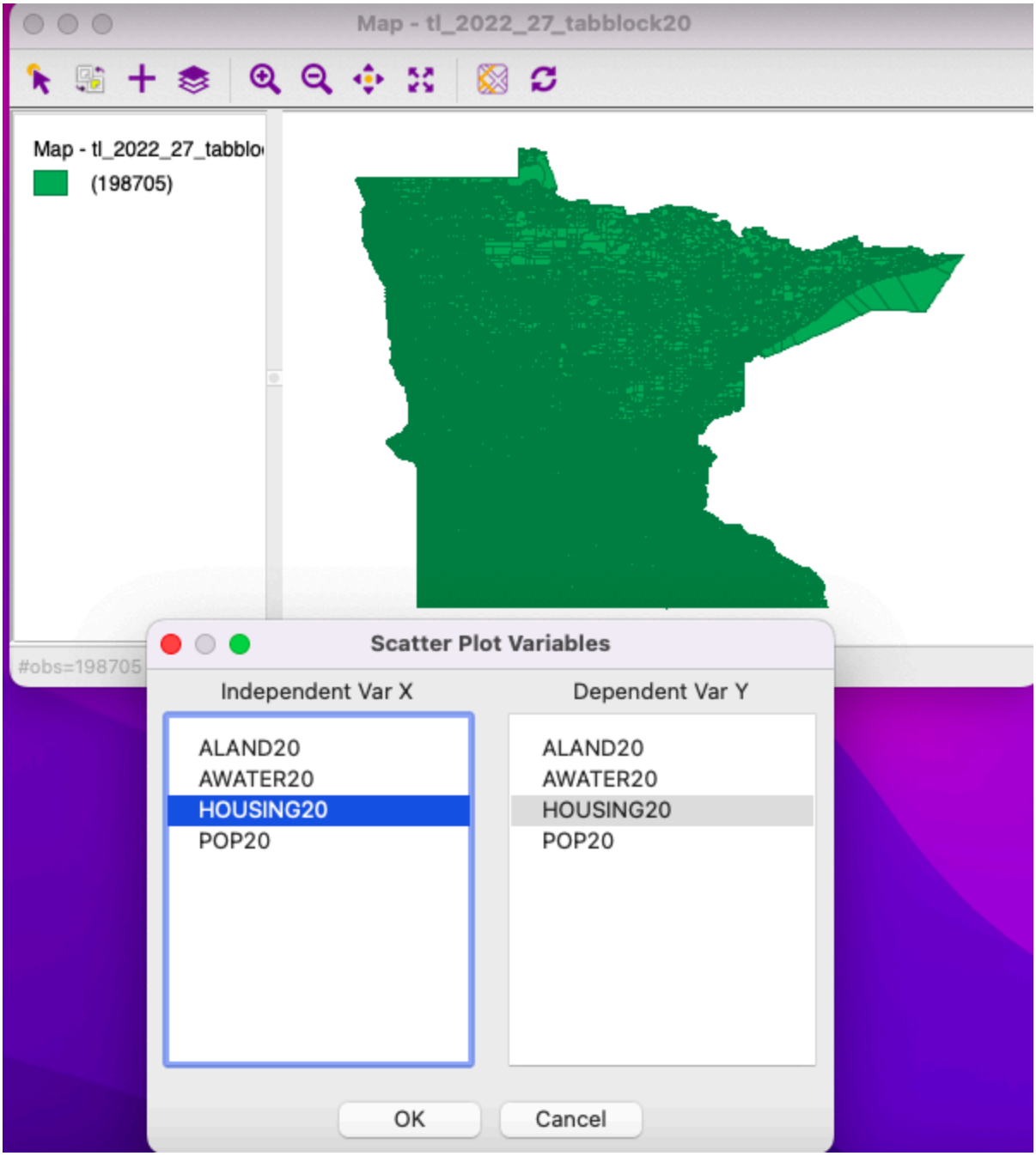
For today's lab, you will need at least three variables that are of interest to your study. Please update your dataset if necessary.

- ***Task 1 Scatterplot***
  - *Select your independent variable and dependent variable, briefly describe the selected attributes.*
  - *Create a scatterplot (non standardized), and interpret the summary stats such as R square, slope coefficient and the intercept.*
  - *Get the correlation coefficient between the two variables. Is the correlation significant or not? Explain your rationale.*
  - *Use linear line and LOWESS to smooth the scatterplot and interpret the fits, respectively.*

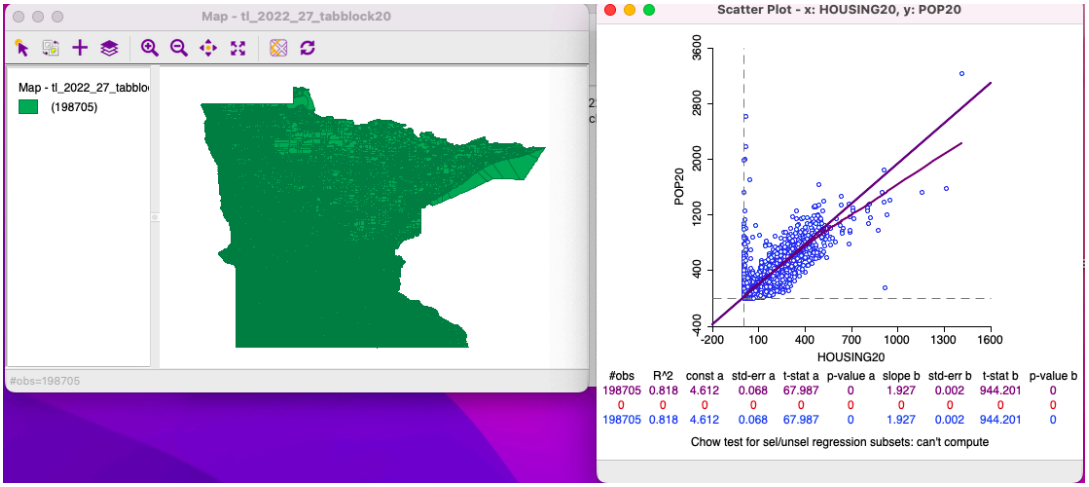
choose 2 variable HOUSING20 and POP20

Selected Variables:

- *Independent Variable: HOUSING20*
- *Dependent Variable: POP20 (Population)*
- *The linear regression line shows (positive,strong relationship).*
- *The LOWESS smooth curve helps identify non-linearity and potential outliers.*

- 
Map - tl_2022_27_tabblock20
Map - tl_2022_27_tabblo
(198705)
#obs=198705
Scatter Plot Variables
Independent Var X
ALAND20
AWATER20
HOUSING20
POP20
Dependent Var Y
ALAND20
AWATER20
HOUSING20
POP20
OK
Cancel

1. *Xxx*

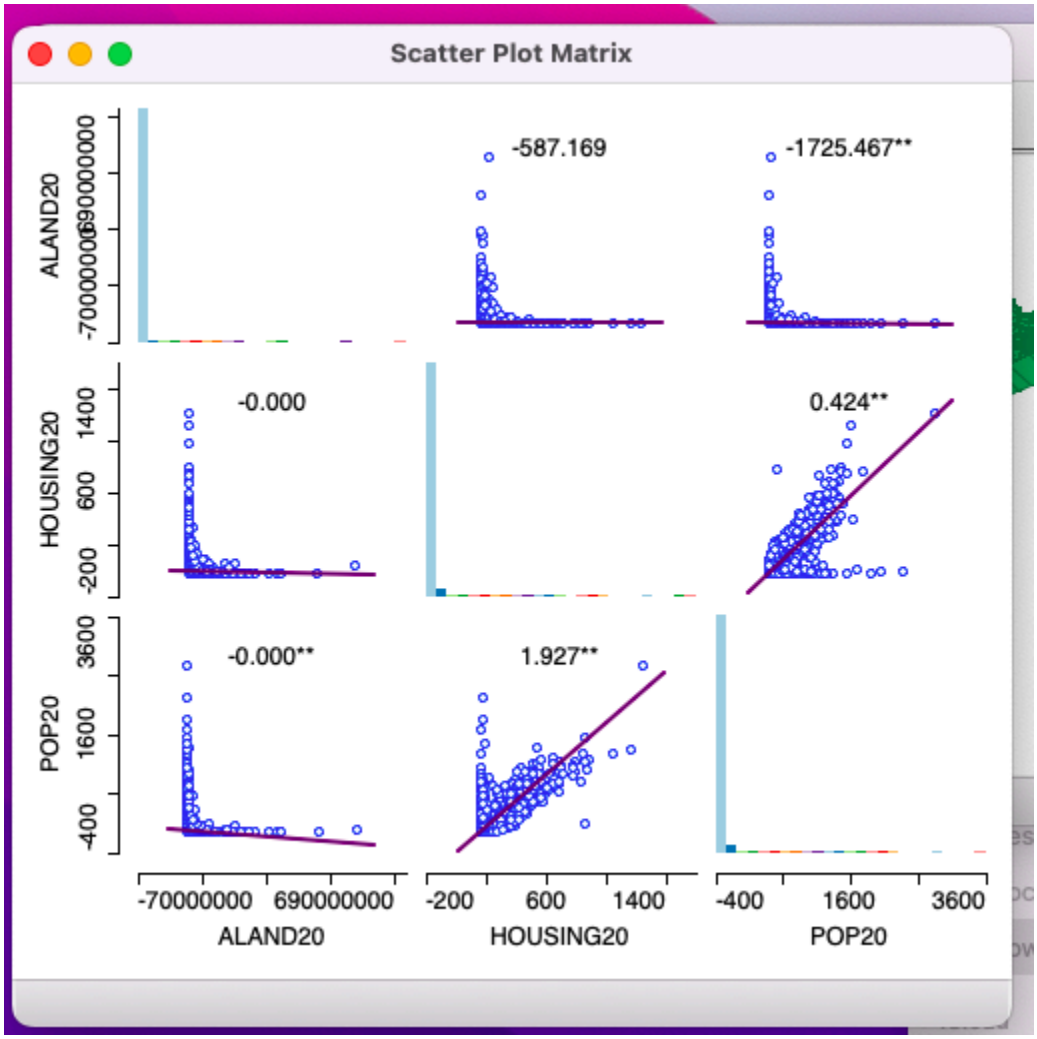


➢ ***Task 2 Scatter plot Matrix***

- *Adding another variable besides the previously chosen two, create a scatter plot matrix.*
- *Whether some of the linear fits are significant while others are not? Explain your results.*

- *The scatterplot matrix shows relationships among POP20, HOUSING20, and LAND AREA.*

- *Some linear relationships are significant while others are not. Specifically, (strong between HOUSING20 and POP20, weak between ALAND and POP20).*



➢ ***Task 3 Enhanced scatter plot***

- *Create a bubble chart for your three variables, select a group of the observations that you found worth further investigating (a subset of bubbles).*
- *Create a 3D scatter plot for the three variables, and select the same group of observations as you did in the bubble chart.*

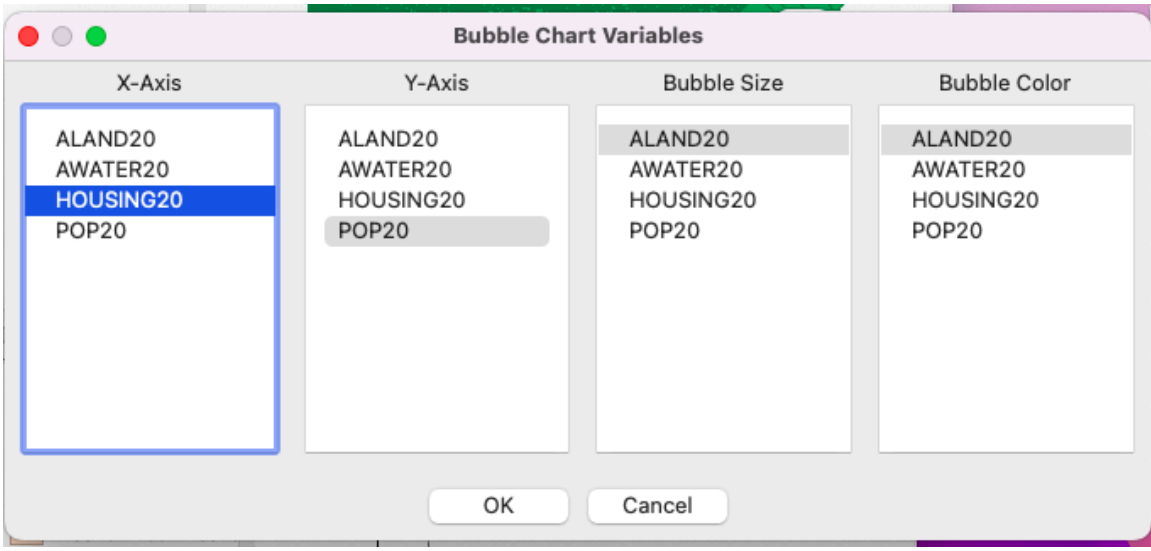
Bubble Chart Analysis:

The bubble chart visualizes the relationship among the three variables (HOUSING20, POP20,ALAND20).

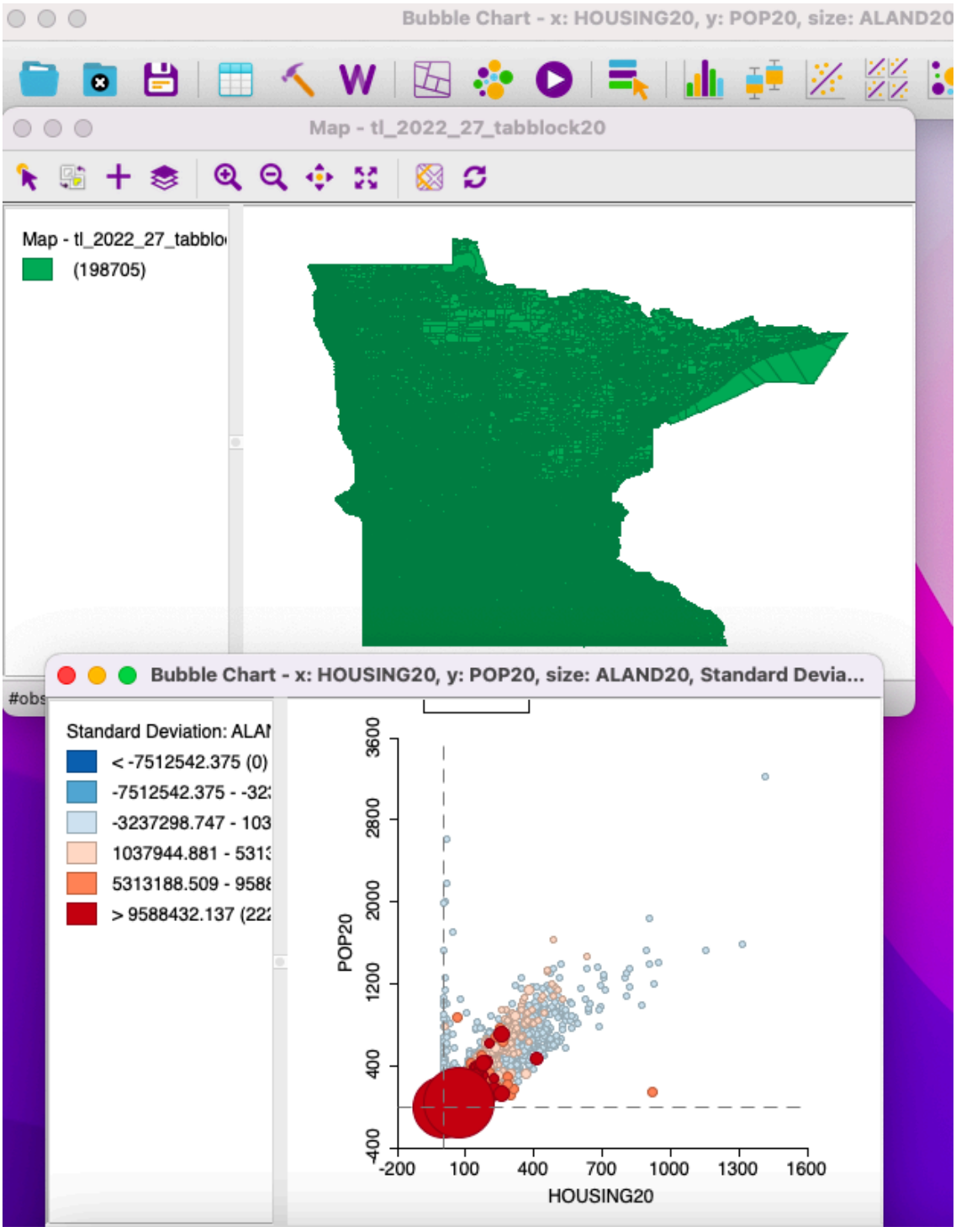
A subset of bubbles

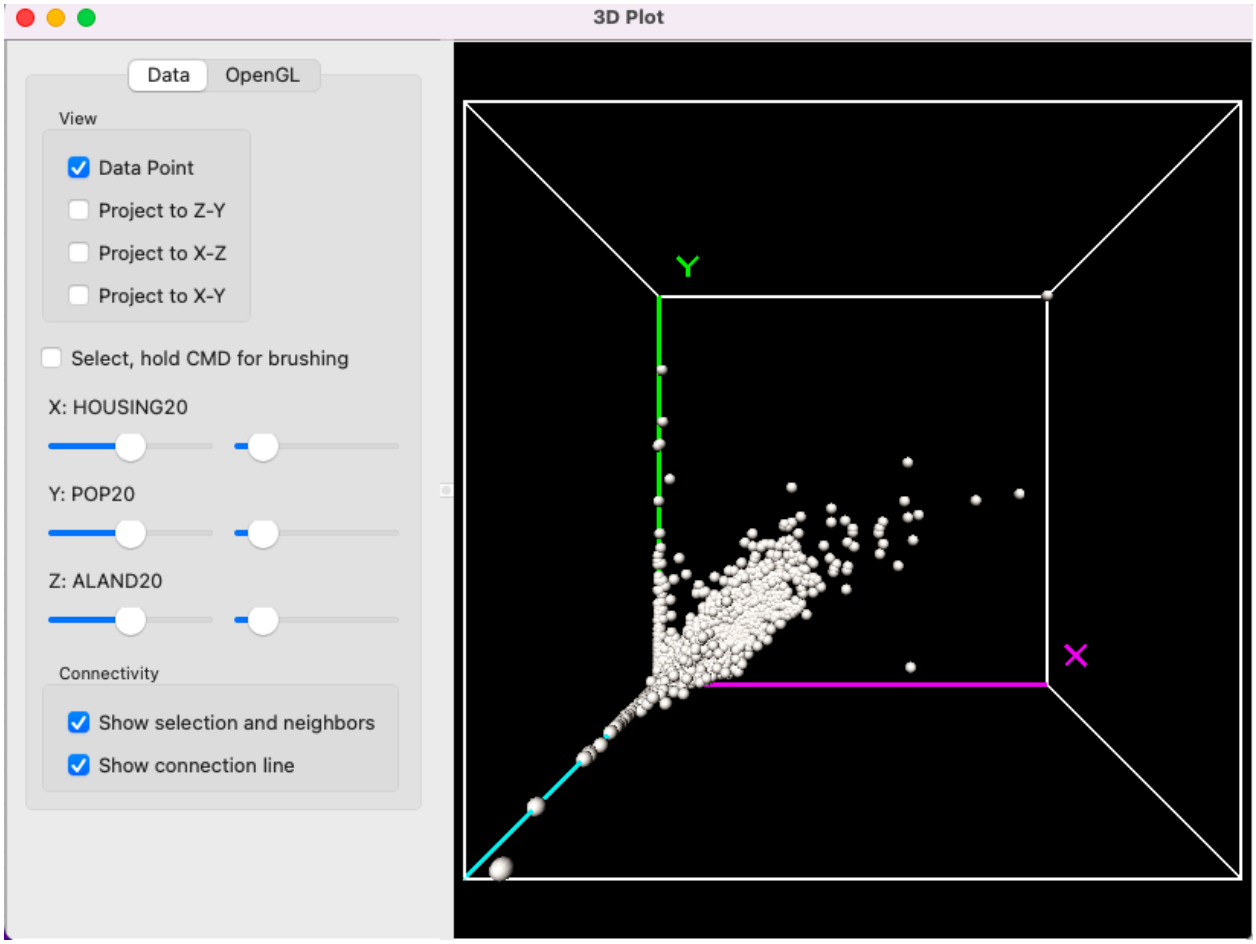
3D Scatter Plot:

A 3D scatter plot confirms spatial patterns in the data. The subset chosen in the bubble chart is highlighted for consistency.

1. 
Bubble Chart Variables
X-Axis
Y-Axis
Bubble Size
Bubble Color
ALAND20
AWATER20
HOUSING20
POP20
OK
Cancel

2.


Bubble Chart - x: HOUSING20, y: POP20, size: ALAND20
Map - tl_2022_27_tabblock20
Map - tl_2022_27_tabblo
(198705)
Bubble Chart - x: HOUSING20, y: POP20, size: ALAND20, Standard Devia...
Standard Deviation: ALAI
< -7512542.375 (0)
-7512542.375 - -32
-3237298.747 - 103
1037944.881 - 5313
5313188.509 - 9588
> 9588432.137 (222
POP20
3600
2800
2000
1200
400
-400
-200
100
400
700
1000
1300
1600
HOUSING20



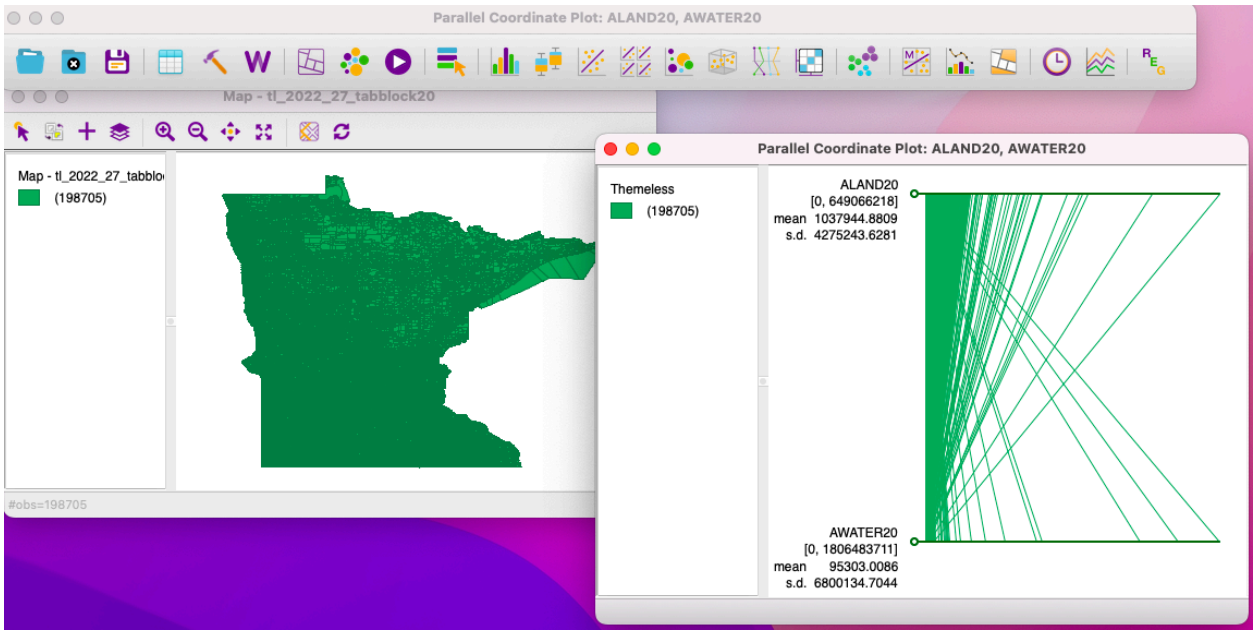
➢ ***Task 4 Parallel Coordinate Plot***

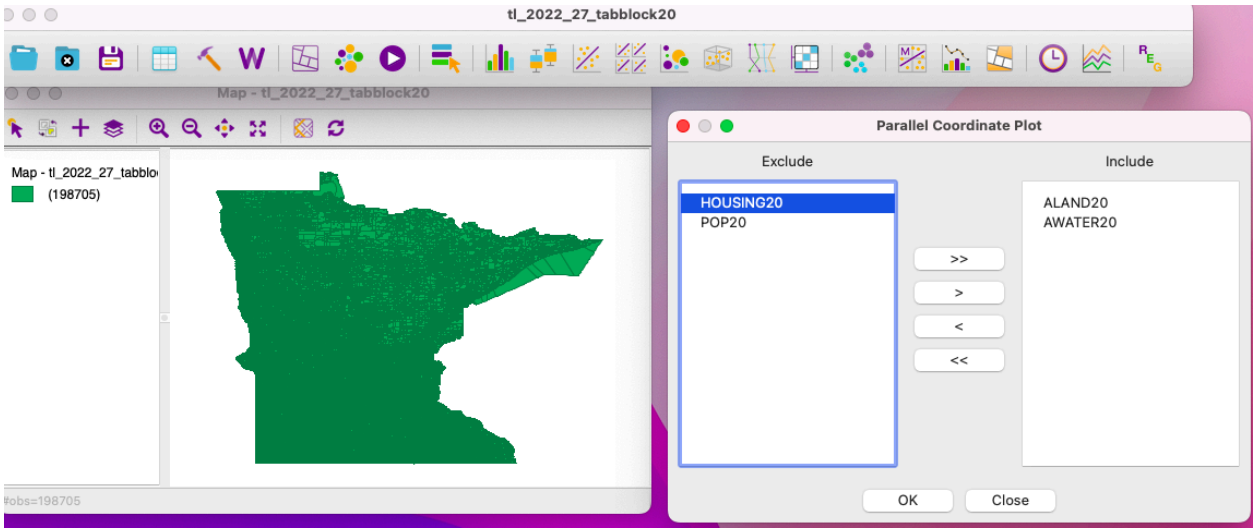
- *Explore potential clusters and patterns using PCP. Please create a default PCP based on your variables, and then use different options to enhance the results (e.g., change the order of variable, classification themes)*
- *Select the same subset as in task 3, and brush the corresponding lines in the PCP*

The default PCP shows clusters based on housing, population, and land area and also water area.

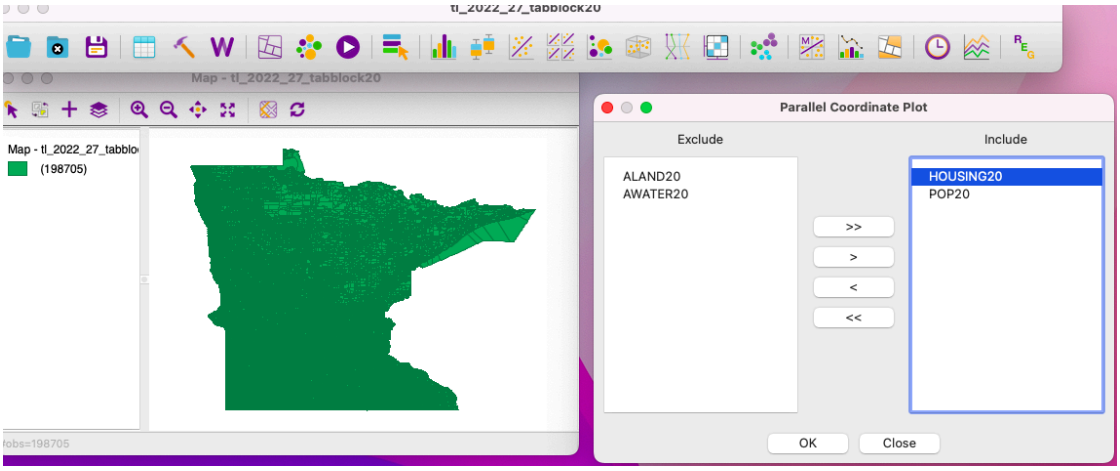
After reordering variables and applying classification themes, clearer patterns emerge.

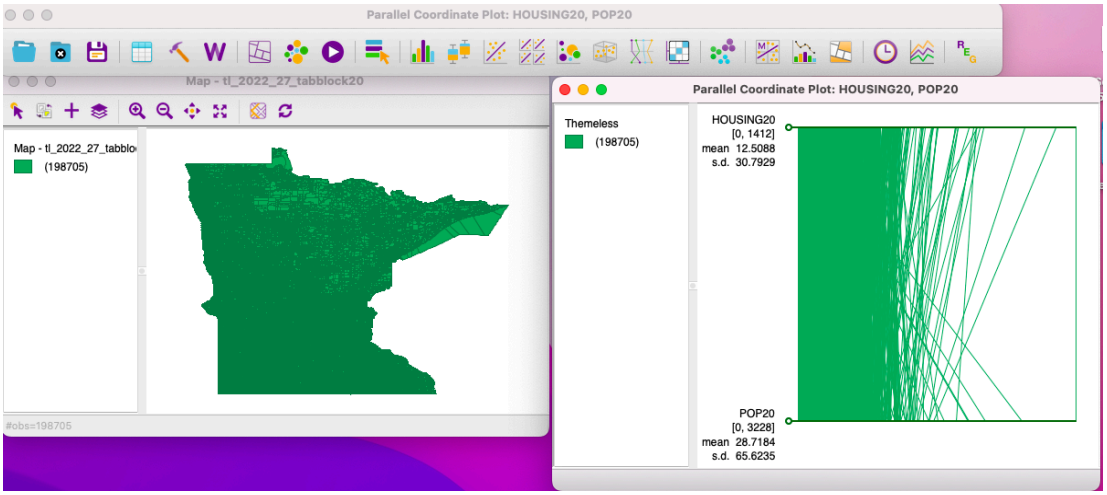
This one ALAND and AWATER

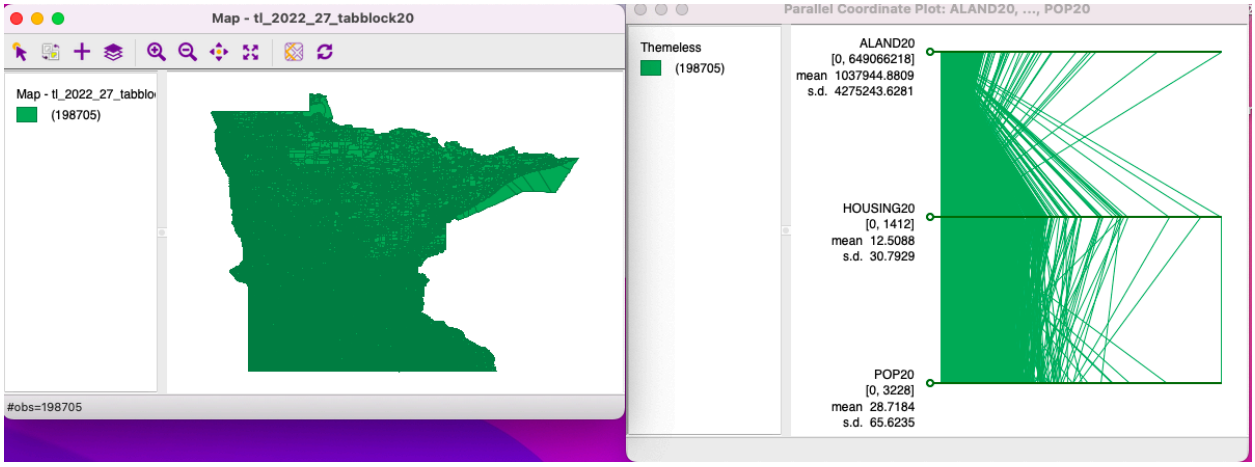


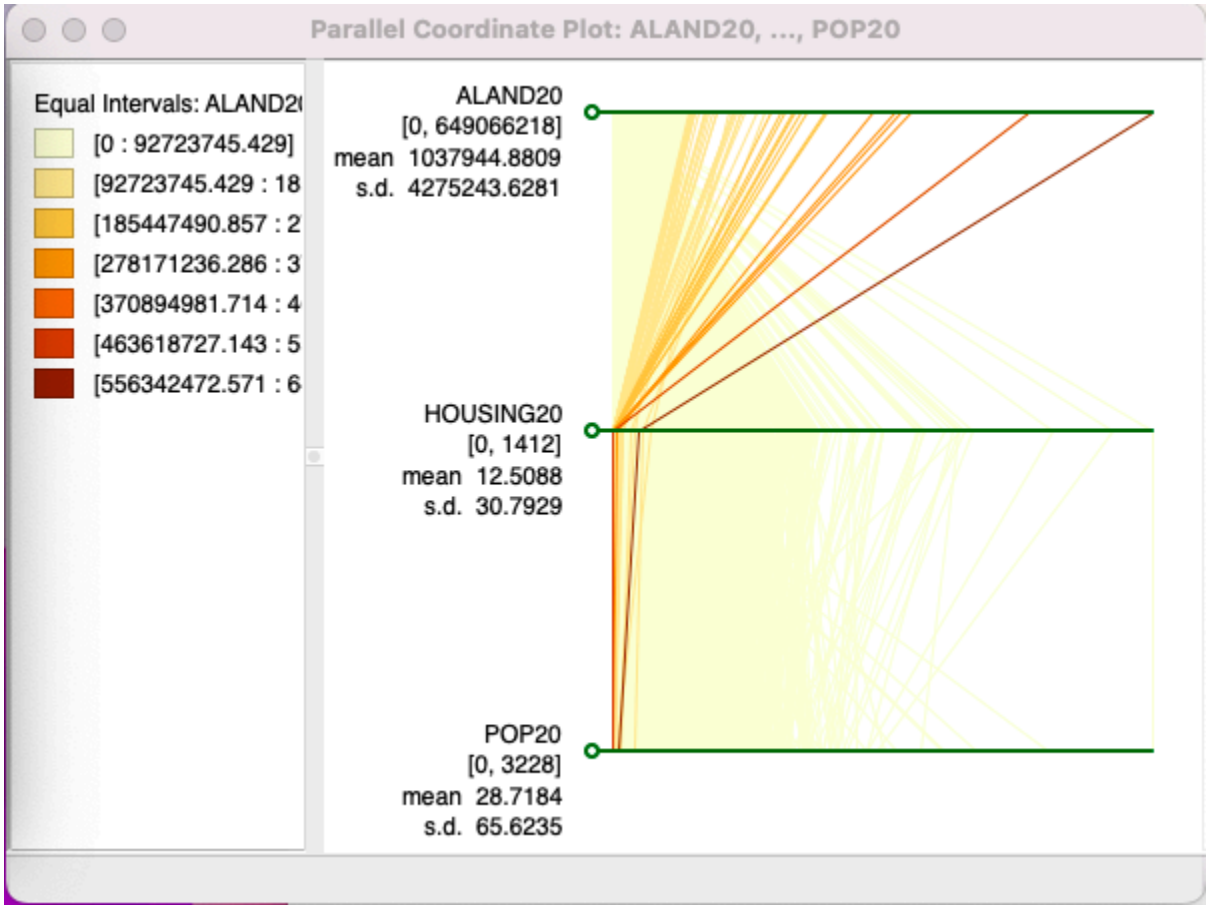


This one is HOUSING and POP.





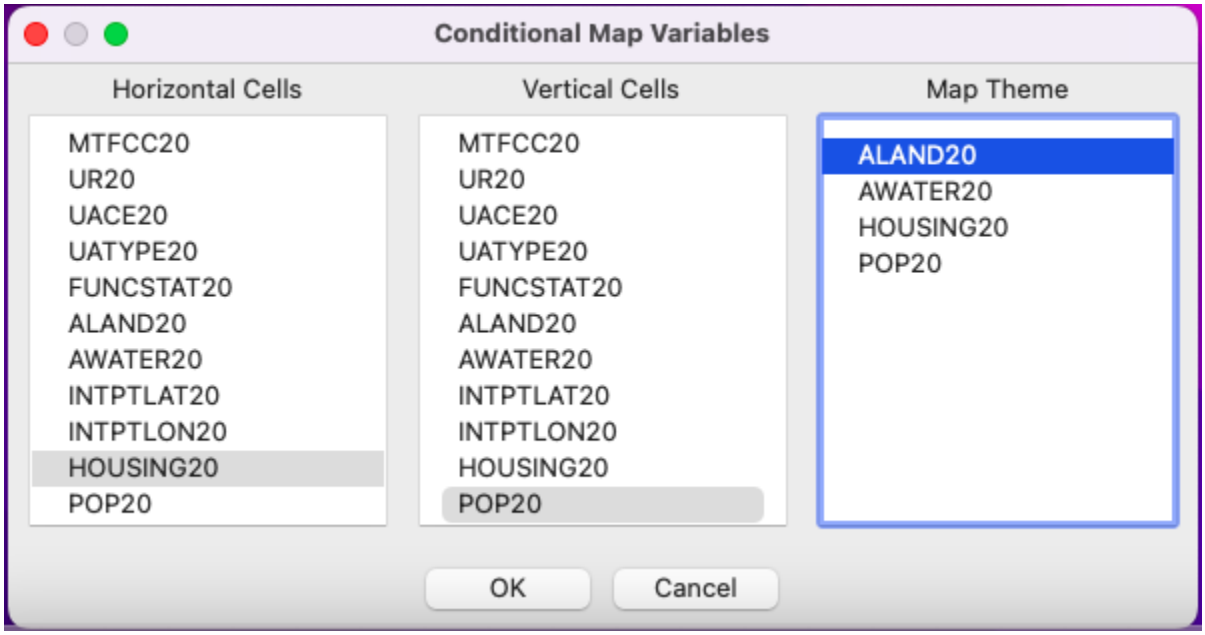


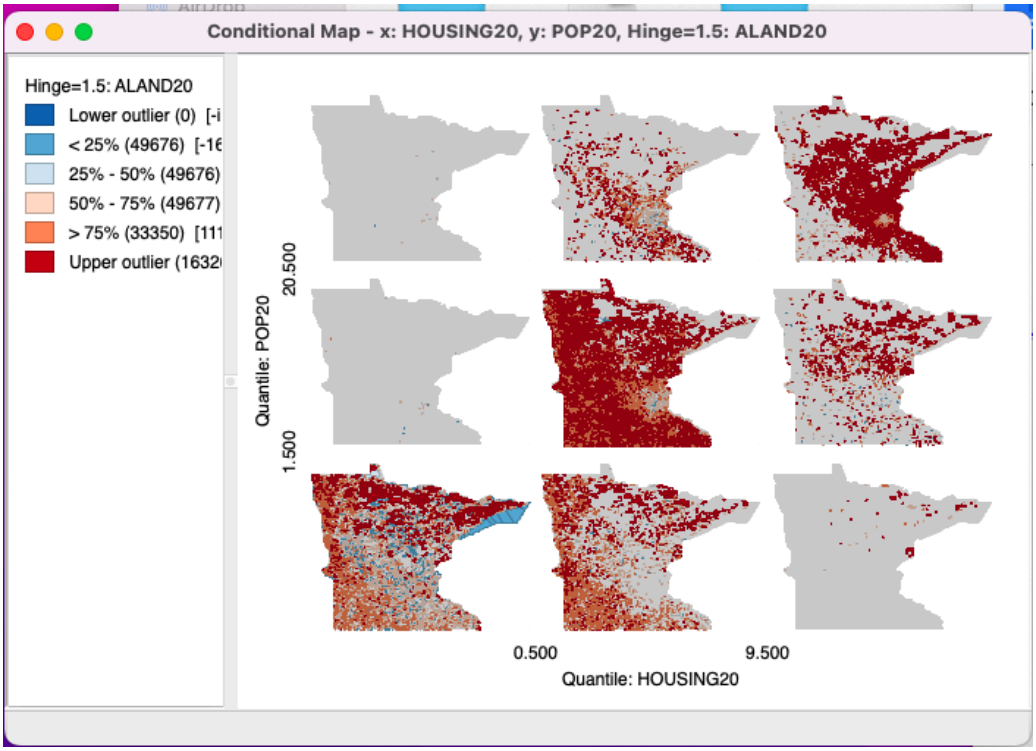


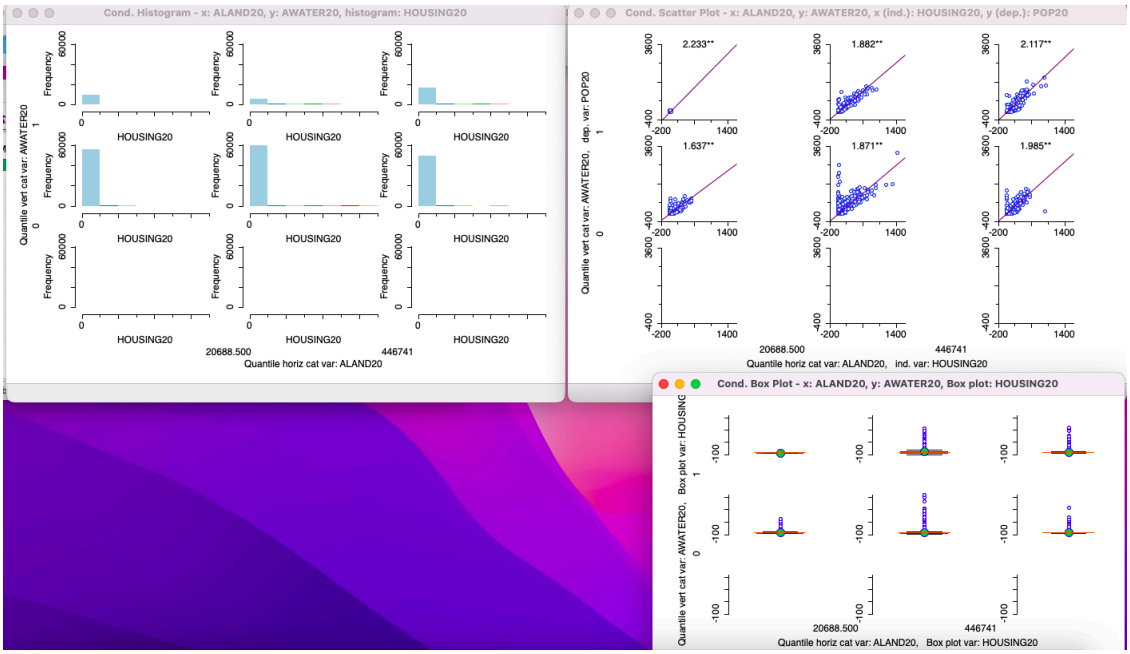
- ***Task 5 Conditional Plots***
  - *Create a conditional map based on just one conditioning variable and one target variable. Explain if there exhibit significant differences across micromaps.*
  - *Create another non-spatial conditional plot for your multiple variables (up to your preference). Whether you can find structural differences along the conditions?*

Conditional Map:

- *I use HOUSING20 and POP20 as the two conditioning variables, and ALAND20as the focus variable.*







Conditional Plot:

A second conditional plot was generated for multiple variables, revealing (structural differences, clustering, or anomalies in the dataset).

Conclusion:

- *The analysis provides insights into the relationships between housing, population, and land area island water area n Minnesota.*
- *The scatterplot, matrix, and enhanced visualizations confirm significant trends.*
- *PCP and conditional plots help identify spatial and non-spatial patterns.*
- *Further investigation of the selected subset may offer deeper insights into regional disparities.*