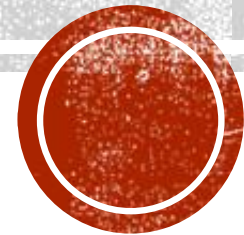
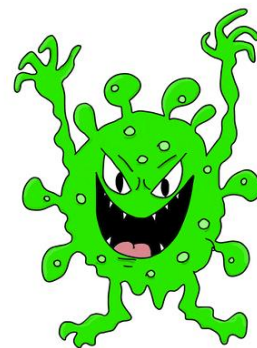


CORONAVIRUS 2020

GIS and Health Analysis

Michael Borowski



A SCARY START TO 2020

- More than 1 million cases of coronavirus have been reported in the US. (Hammond, 2020)
- This has led to a nation wide stay at home order which also forced many businesses to temporarily close doors.
- More than 30 million Americans have filed initial unemployment claims since the middle of March 2020. (Hammond, 2020)
- This pandemic has led to global implications and has been hard on the market.
- This ongoing virus has led to many questions and insecurities.



A LOOK AT PHILADELPHIA

- This research project looks to analyze patterns of positive Coronavirus case clustering according to population rates and maps the data to offer statistics and insight of the areas being most affected.
- This project looks at Zip Code level data and the City of Philadelphia's reporting of coronavirus testing.



DATA

- Population data-
 - Explore Census Data. (n.d.). Retrieved from <https://data.census.gov/>
- Coronavirus Data-
 - Testing and data: Department of Public Health. (n.d.). Retrieved from <https://www.phila.gov/programs/coronavirus-disease-2019-covid-19/testing-and-data/>
- Zip Code layer-
 - Zip Codes. (2014, December 8). Retrieved from <https://www.opendataphilly.org/dataset/zip-codes>



METHODS- CONFIRMING DATA

- The Coronavirus data was downloaded as csv files for the dates of March 31st and April 21st.
- These files were exported in ArcMap and the attribute tables were altered to conform to joining fields under specific column types.
 - March 31st data required replicating Zip Code field as string
 - April 21st was in string and duplicated that field as a long type to use as a unique ID when creating the spatial weight matrix.
- The data was joined to the Zip Code polygon via appropriate Zip Code columns and kept only matching records.
- A field was created dividing the positive test results by zip code population.



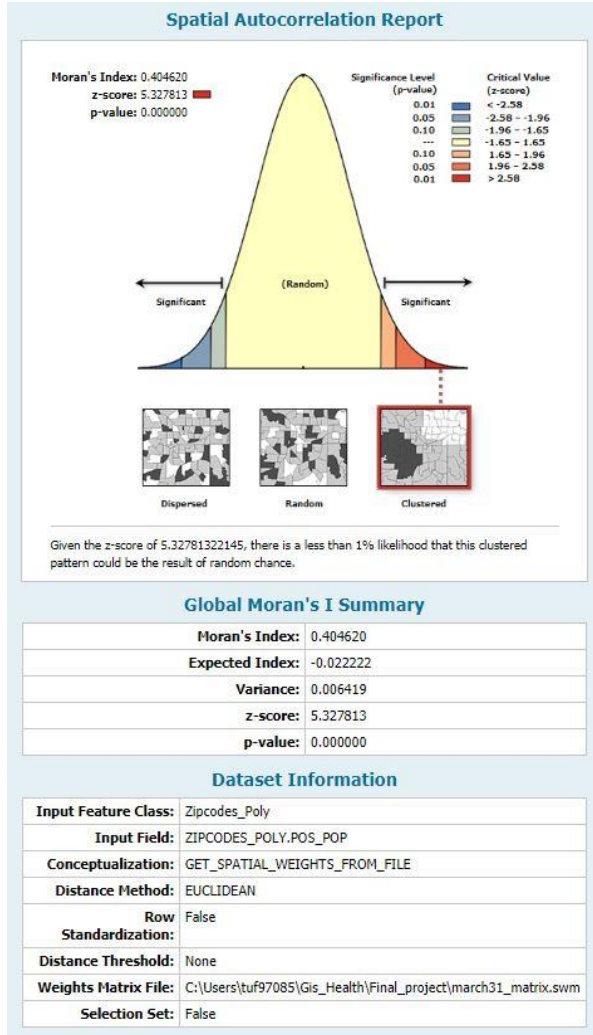
METHODS- ANALYZING CLUSTERS

- Spatial Weight Matrixes were created in ArcMap using the unique ID Zip fields and CONTIGUITY_EDGES_CORNERS as the Conceptualization of Spatial Relationships.
- A spatial autocorrelation report was created using the positive case per population fields and the matrixes created above.
- A local clustering analysis was mapped using the cluster and outlier analysis in ArcMap passing in the same parameters as in the Spatial autocorrelation.
- Then limited the output to show only high-high and low-low clusters.

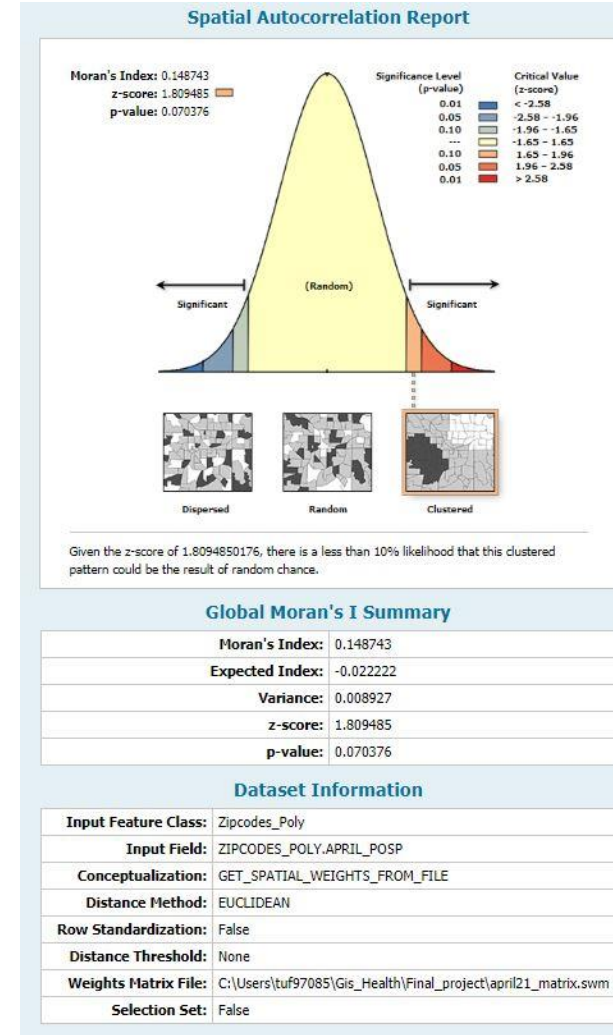


SPATIAL AUTOCORRELATION

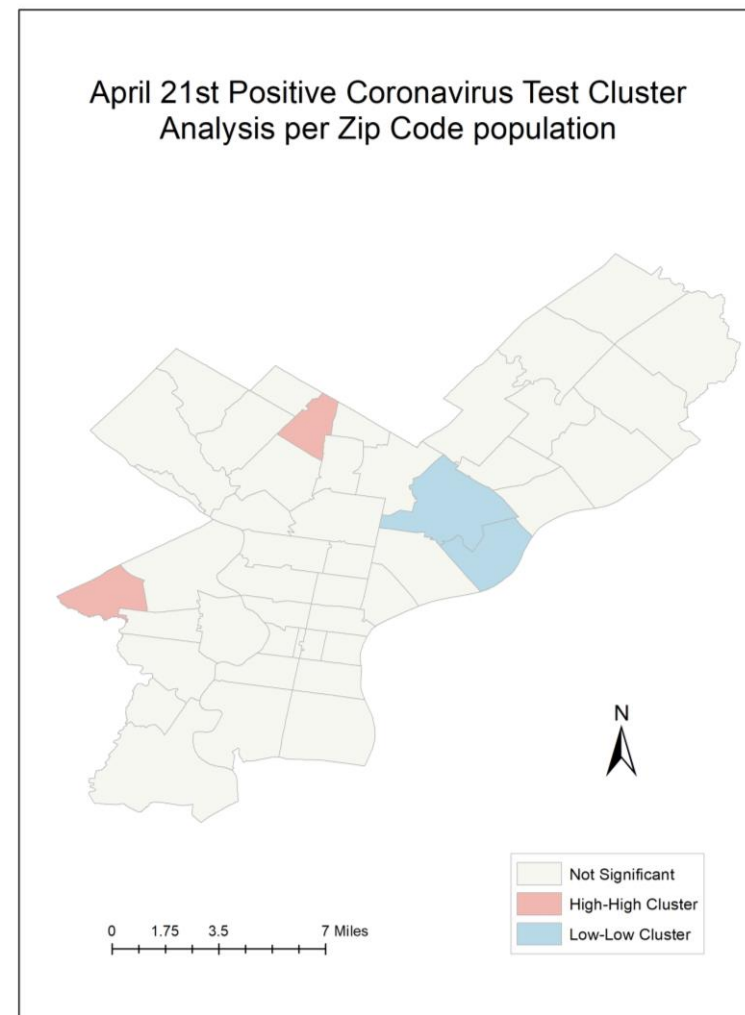
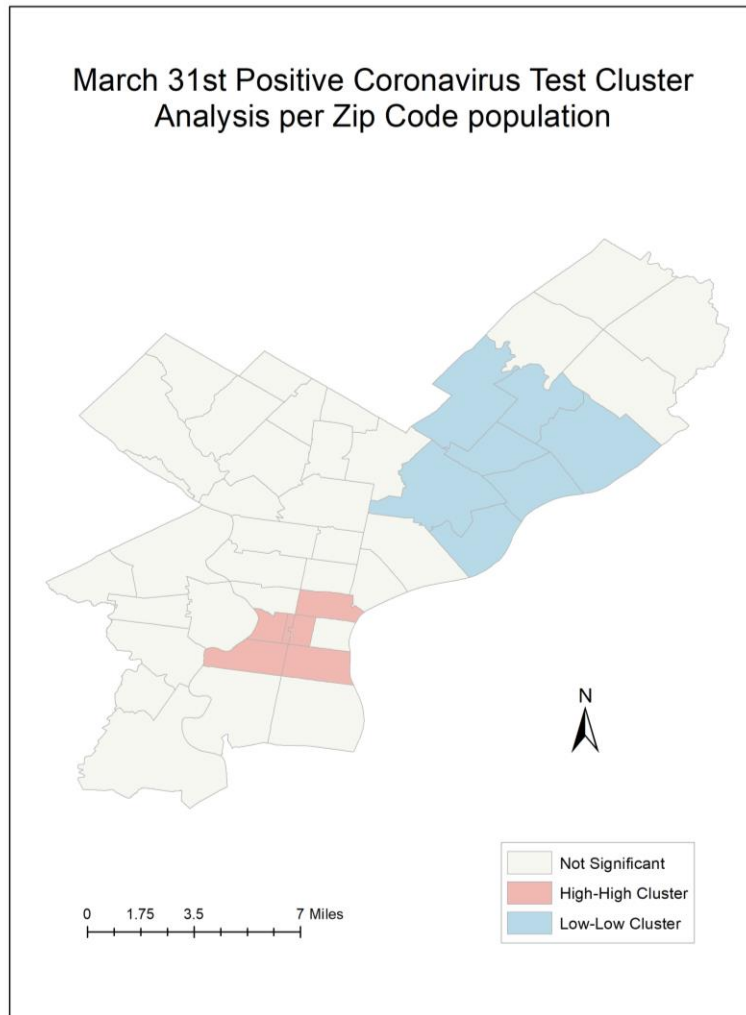
March 31st



April 21st

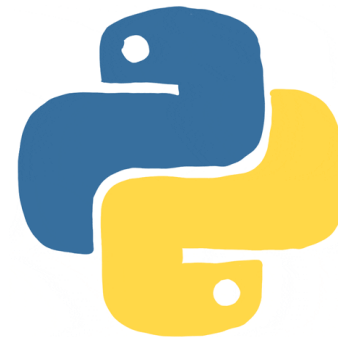


CLUSTER MAPS



CREATING INFORMATIVE WEB MAPS

- In python, the folium extension was used to create choropleth maps.
- The code reads the joined shp file containing the zip code poly data, the population data, and the coronavirus data from both dates to create two choropleth layers with data provided in a tooltip pop-up.
- file:///C:/Users/tuf97085/Gis_Health/Final_project/choropleth.html



FUTURE FINAL STEPS

- Fix double legends
- Host on Github



SOURCES

- Hammond, E., & Hayes, M. (2020, April 30). US coronavirus update: Number of cases exceed 1 million. Retrieved from <https://www.cnn.com/us/live-news/us-coronavirus-update-04-30-20/index.html>

