**GEOG 2011 Final Project – Micah Shannon**

My research question was “what residential areas of Athens-Clarke County are furthest away from schools?” This question is interesting and important because it could reveal areas of Athens-Clarke County where students and parents may have difficulty getting to school on time, especially if bus services are unavailable or unreliable. This could allow the county to know where to devote resources for new schools or for better transportation services, or just which students might be late to school for reasons beyond their control.

Data for this analysis were sourced from the Athens-Clarke County Open Data Portal (<https://data-athensclarke.opendata.arcgis.com/>), which is created for public use by various agencies within the Athens-Clarke County government. Specifically, I downloaded shapefiles for Zoning by Parcel, School Points, and Street Centerlines. Information on how each shapefile was created was not provided, but I would assume it was created using already existing records and reference maps which were created from county code or from manual observation. The variables I used were called CurrentZn (current zoning) in the Zoning Shapefile to determine which parcels were zoned for residential use, TYPE in the School Points to determine school type and filter out colleges, and a calculated “distance” variable which represented the distance from a parcel to the nearest school. The Street Centerlines were purely a visual enhancement for my map.

To prepare the data from mapping, I first loaded all three shapefiles into QGIS. Next, I filtered the school points so that only elementary, middle, high, and pre-schools were present. Then, I performed a nearest-neighbor join between the school points and the parcels, which matched each parcel polygon to the nearest school point and calculated the distance in feet between them, allowing me to perform a proximity analysis using Euclidean distance. The distance in feet was based on the West Georgia Transverse Mercator (EPSG:2240 – NAD83) CRS, which uses feet as its unit of measurement. Next, I filtered the new joined layers so that only parcels zoned as Residential Single-Family, Residential Multi-Family, or Agricultural Residential would be shown. Then, I classified the data using an equal count/quartile scheme based on distance from the nearest school. I choose a color scheme which was red for close distances and blue for far distances, to create a “hot-spot/cold-spot” effect, emphasizing the parcels closest and furthest from schools. The final map is shown on the page below.

Map

Description automatically generated

This map answers my research question of “what residential areas of Athens-Clarke County are furthest away from schools?” because it shows which residential areas of Athens are closest to and furthest from schools. It does so in a manner that mostly circumvents the modifiable areal unit problem by using parcels as the unit of analysis rather than some larger division such as census block groups or tracts. One shortcoming is that it is based on Euclidian distance instead of network distance, which would be a better metric of how far schools are from residential areas in terms of the time it takes for a student to travel from home to school. That issue notwithstanding, this map at least provides a good estimate of areas where students are close to or far from their schools.

This project shows what I have learned in the course because it required me to use all the aspects of GIS that I learned in the course, most importantly geospatial data (what it is and how it works), how to use GIS software, how to perform geospatial analysis, and how to use good design principles to create an informative and visually pleasing final map.

To be specific, I first had to formulate a research question that was both interesting and informative. Then, I had to find and understand geospatial data which would allow me to answer the question, using the information I learned about those types of data in class. Next, I had to load that data into GIS software, and use my acquired knowledge about how to use GIS software and geospatial analysis techniques, namely proximity analysis, to make a novel observation about the data I sourced. Finally, I had to design a map that visually represented by data in an informative way that utilized the good design principles that we learned about in class.