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Final Project Research Paper
URP4273
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Finding the Most Suitable Place to Live in the US by Zipcode

Title/main goal

The main goal of this project is to collect data on two different states of our choice, Washington and Tennessee, and analyze the data geographically to determine which state is the better place to live. By displaying our collected data using GIS and then comparing the states visibly, we can determine, based on our criteria, which state would be ideal for young people of ages 20-30 years old who are recent college graduates and looking to start their careers and their families.

Background

Many people aged between 20-30 years are finishing their college education and moving to a new location to establish themselves and their families. People between the ages of 20-29 years old make up about 33.92% of Americans who move to either a new state or a new country altogether. When considering where to move to, many factors must be taken into account. In this project, we choose criteria that are relevant to young college graduates and young families.

Scope and Characteristics of the study area

The two states we decided to focus on for our study were Washington state and Tennessee. The reason behind our choice is the fact that Washington state and Tennessee are different in terms of the region they are located in and what the states are known for. We felt that by looking at these two states, we would find vast differences, making our journey to find the best place to live an interesting one. In order to further narrow down our study area, we focused on people ages 20-30 years olds. Our hope with this age range was to focus on recent college graduates and young families.

Objectives for accomplishing main goal/criteria

In order to decide which state is better to live in, we chose three criteria to evaluate for both Washington and Tennessee. For each of these criterion, we chose indicators to evaluate them. The three criteria we chose were quality of life, recreational activities, and livability risk. For quality of life, the indicators we evaluated are disposable/median income by zipcode, poverty level, by county, and public transportation by zipcode. Within public transportation we looked at specific points of park and ride locations and bus stop locations. Our indicators for recreational activities include the number of and proximity to national and state parks by zipcode, and location of biking and walking trailheads by zipcode, as well as the proximity to these trailheads. Our indicators for livability risk are natural disasters by zipcode, such as earthquakes, and wildfires, as well as fault lines by zipcode and the proximity to specific fault trench point and active fault polygons.

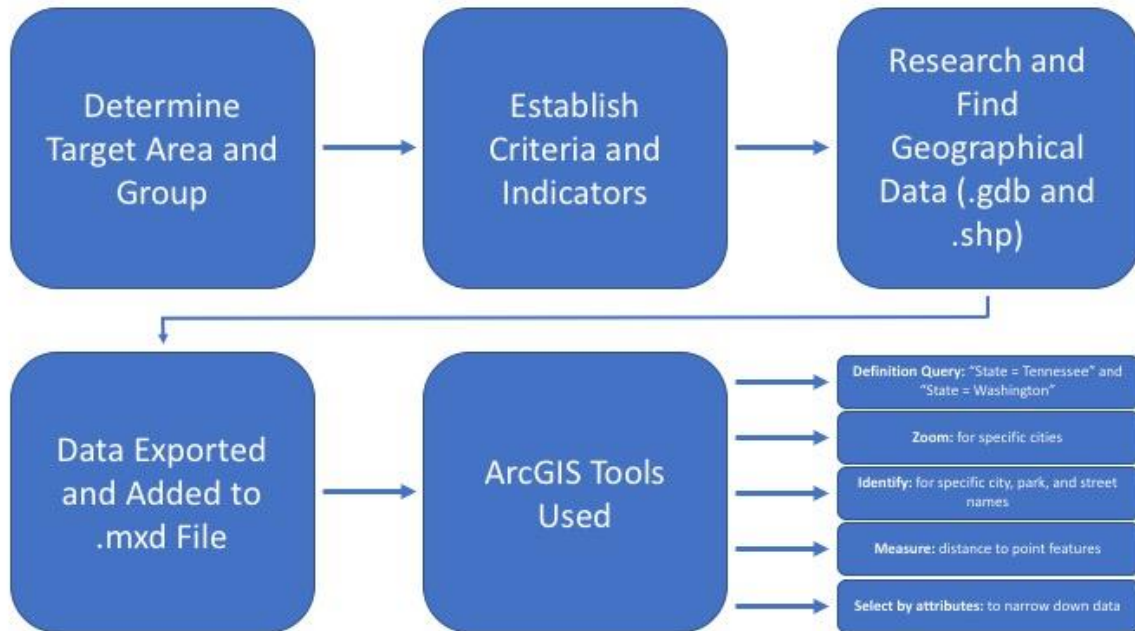
Methodology

Analysis Process:



As demonstrated by the flowchart, we began our study by narrowing down our subjects to 20-30 year olds. Then, we chose our three criteria which were quality of life, recreational activities, and livability risk. From there, for quality of life we found disposable income by zip code, percent poverty by county, and public transportation by zip code. For public transportation by zip code, we found park and ride points and bus stop points. Then for recreational activities, we found number of parks by zip code and then proximity to parks and number of trailheads by zip code and then proximity to trailheads. Lastly, for livability risk we found natural disasters by zip code, including earthquakes, wildfires, slope failure risks, and fault lines by zip code including proximity to fault trench points and proximity to active fault polygons. Finally, all this data was combined using overlay analysis.

ArcGIS Tools Applied:



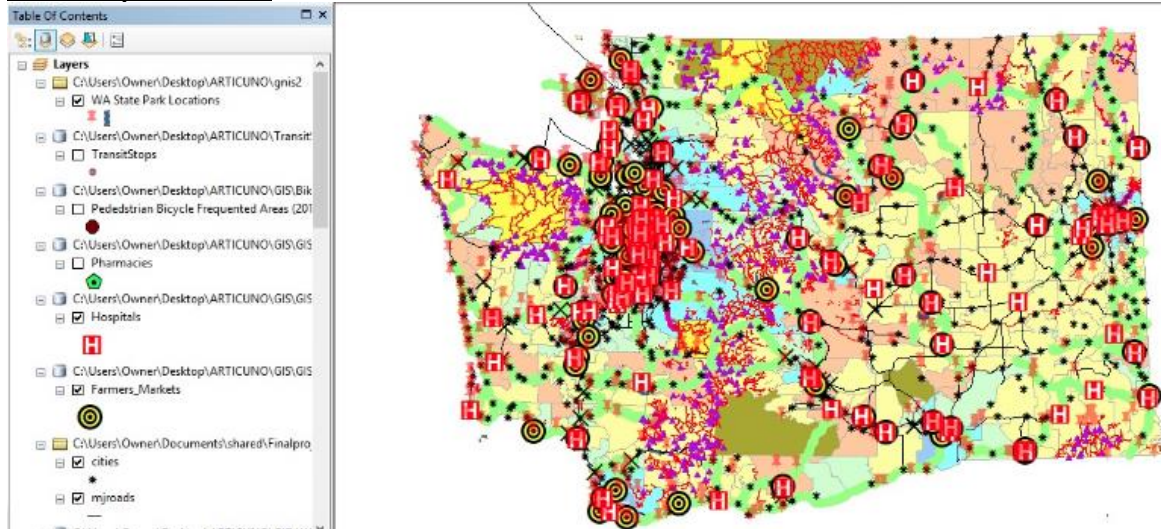
Our methodology for finding the data is shown above. We first began by determining our target area and group; 20-30 year olds. We then established the criteria and indicators that we wanted to look at for each state. Once we had a list compiled, we conducted some research and found geographical data for these criteria and indicators in the form of .gdb and .shp files. We then exported the data and added it to an .mxd file. Once we took a look at the attributes tables for these data and determined that it was what we were looking for, we used ArcGIS tools to narrow down our search to specific counties and zipcodes of each state. The types of ArcGIS tools that we used were definition query (“State = Tennessee” and “State = Washington”), zoom (to zoom into specific cities), identify (for specific city, park, and street names), measure (to measure the distance to point features), and select by attributes (to narrow down the data).

The process of our methodology was unequal for both states, as we encountered difficulties finding some of the criteria and indicator data for Tennessee. Standardization of the states was not the same, and each state had different data available which was provided at the discretion of the state. We found that Washington had more data readily available, while Tennessee had little to no information on transportation and other resources. Therefore, we supplemented with data such as median income, college attendance percentage, hospital locations, parks and trails, earthquake and fault lines, and poverty percentage.

Results and Discussion

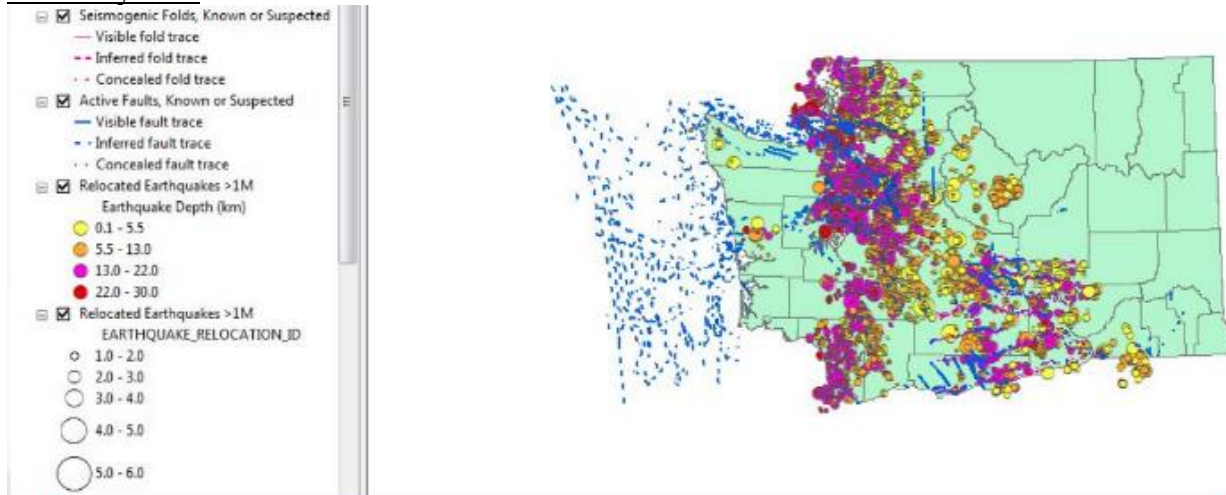
Washington

State Map Overview

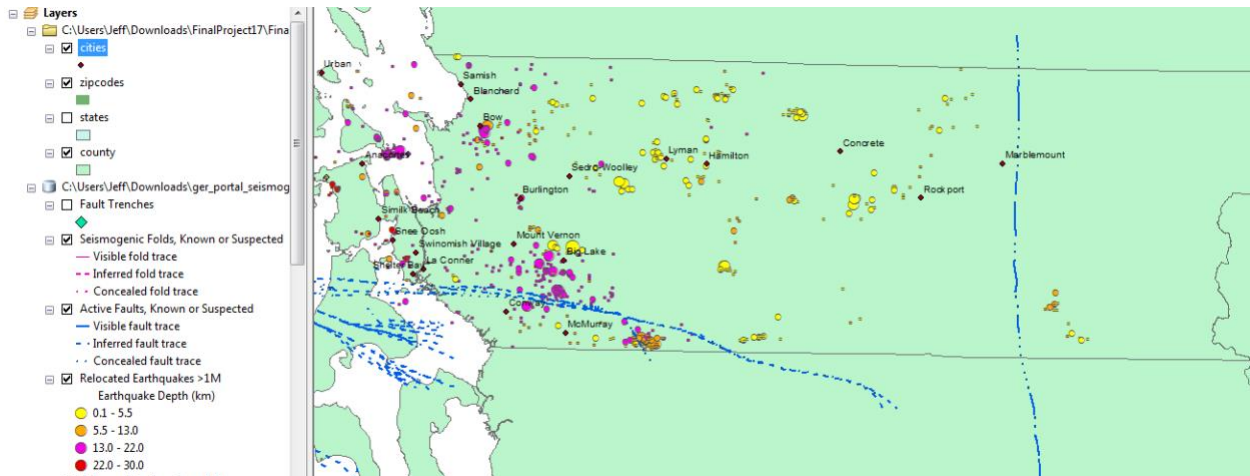


Feature Map overview for WA. Point Feature Attributes display Hospitals, Trails, State Parks, Trailheads, Farmers Markets, National Parks, Major Roads, Scenic Highways, and many other features. Overall, data management availability for the State of Washington enabled data output of a diverse array of .gdb and .shp ArcGIS files to ArcMap software.

Livability Risk

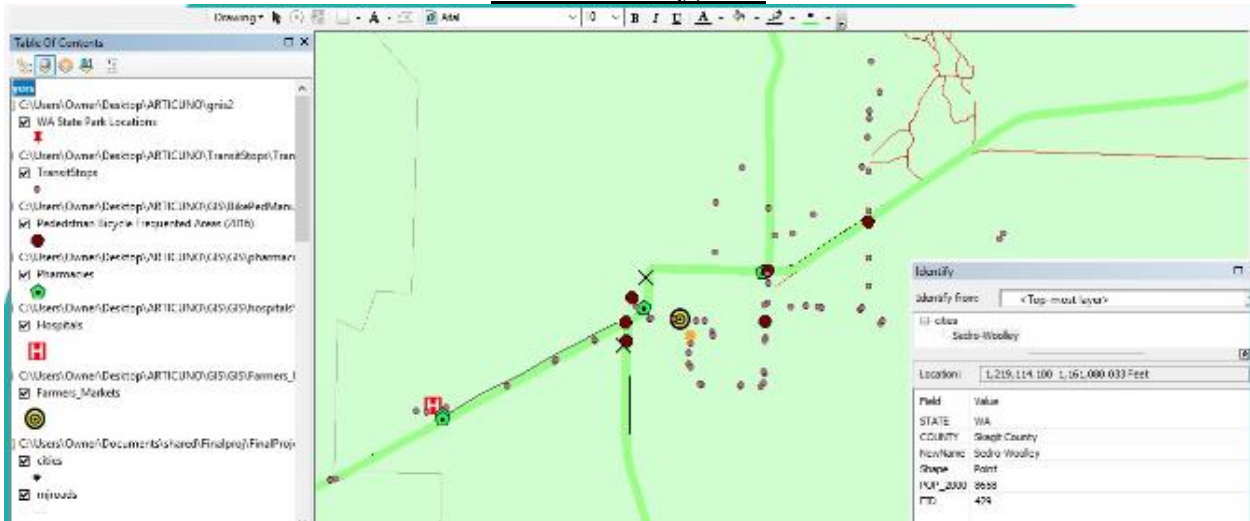


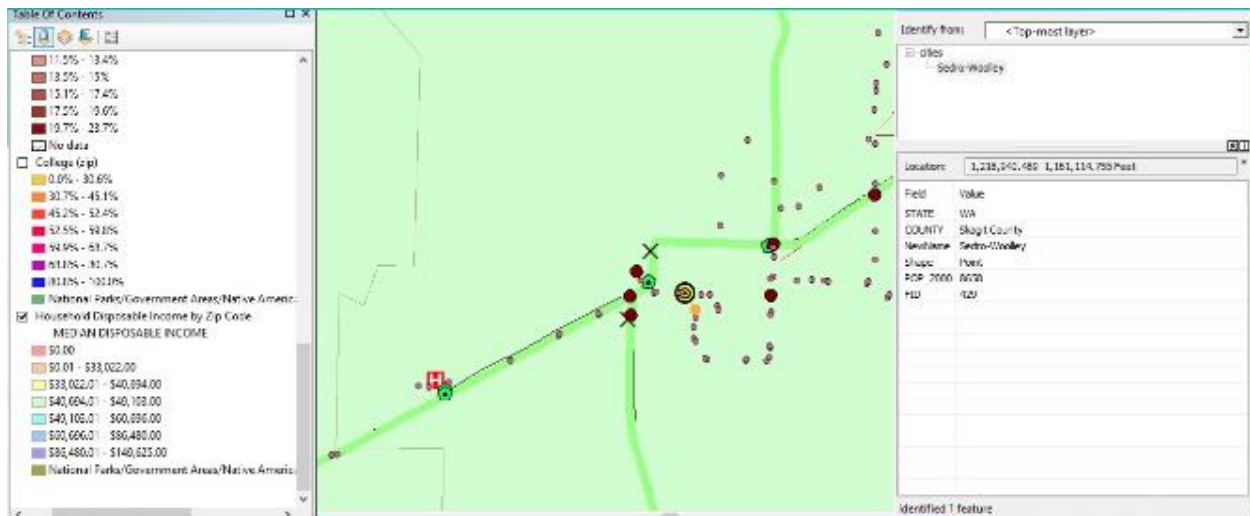
The livability risks we researched for Washington were not used to eliminate counties or zip codes. Instead we used it to add a comprehensive understanding of what the geographic features occur in our zip codes.



When we narrowed down our search to Skagit county from the other measures, we did a select by location to see if any of the cities were within 10 miles from past earthquakes. Both cities we were interested in were within 10 miles of an earthquake, but more than 15 miles away from a fault so, we did not use these geographic features to decide which city was the better location.

Sedro-Woolley, WA





The following screenshots illustrate the ArcMap display for Sedro-Woolley, WA with an overlay analysis of the Median Disposable Income, as provided by ESRI 2009 Metadata. Based on Proximity, Overlay, and Network Analysis the following features were discovered:

Attribute/Tabular Analysis:

Zip Code: 98284

POP_2000: 8,658

Major Roads: SR-20, SR-9

Skagit County (Percent Poverty: 11.4%)

2009 ESRI Zip Code MetaData

Median Disp. Income: \$43,267

2009 ESRI DI_BASE: 9,593 /// DI_35-49k: 1,896 /// DI_50-74k: 2,368

Proximity Analysis (Measure, Zoom, Pan Tool):

0.13mi to Sedro-Woolley Farmers Market (Ferry St. & Metcalf St.)

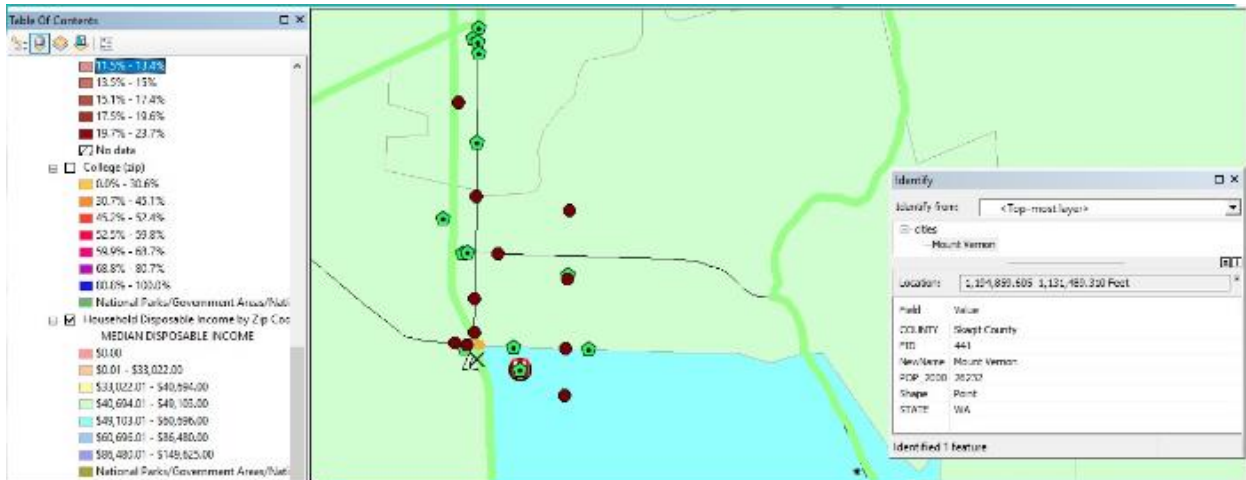
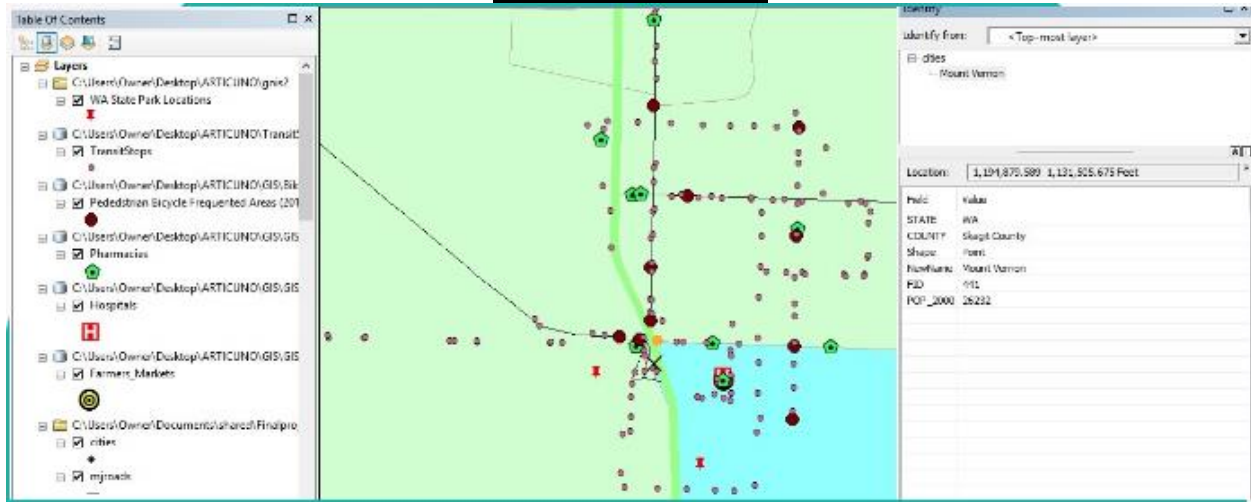
0.50mi to Park and Rides(SR 20 and State St(SR9)., SR 20 302 F and S Grade Rd)

1.86mi to PeaceHealth United General Medical Center (2000 Hospital Drive, 98204)

0.70mi to Skagit County Cascade Trail (Local Government Trail/Hiking Pedestrian Only)

0.37mi to Walgreens Pharmacy (320 Harrison St.)

Mount Vernon, WA



The following screenshots illustrate the ArcMap display for Mount Vernon, WA with an overlay analysis of the Median Disposable Income, as provided by ESRI 2009 Metadata. Based on Proximity, Overlay, and Network Analysis the following features were discovered:

Attribute/Tabular Analysis:

ZIP: 98273

POP_2000: 26,232

Proximity Analysis (Measure Tool, Buffer):

Major Roads: Intersate-5, Memorial Highway (Left)

W Division St Bridge (104 PM 2016), W Division @ S 1st on S 3rd St Bend(100 total AM/PM 2016), Riverside Dr-100+ AM/PM

-Pedestrian Bicycle Frequented Areas Parks and Rec Manual Count Metadata (2016)

0.49mi to Skagit Valley Hospital (1415 Kincaid St E)

0.49mi to Skagit Valley Hospital Pharmacy (1415 S Kincaid St E)

0.49mi to Skagit Regional Clinics Mount Vernon Pharmacy (1410 Kincaid St E)

- 0.25mi to Mount Vernon Park and Ride (I-5 and Kincaid St (across from Skagit Station)), 44 Spaces
- 0.42mi to Mount Vernon Farmers Market (1415 Kincaid St)
- 0.14mi to Valley Compounding Pharmacy (221 S 1st St, 98273)
- 0.92mi to Hilcrest State Park
- 0.48mi to Edgewater State Park
- 9.0mi to Walker Valley Forest Area (Park, State Government Trails)

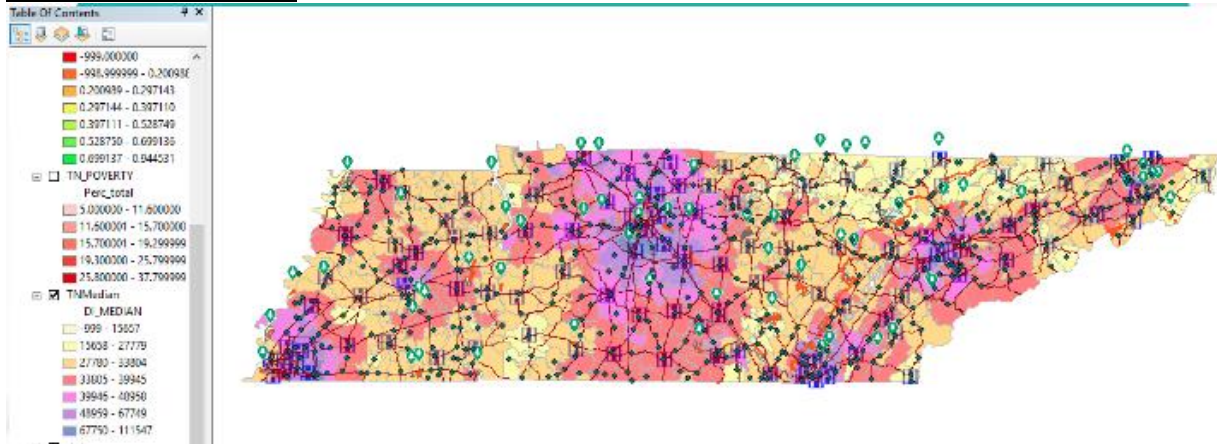
Tennessee

Earthquakes and Fault Lines



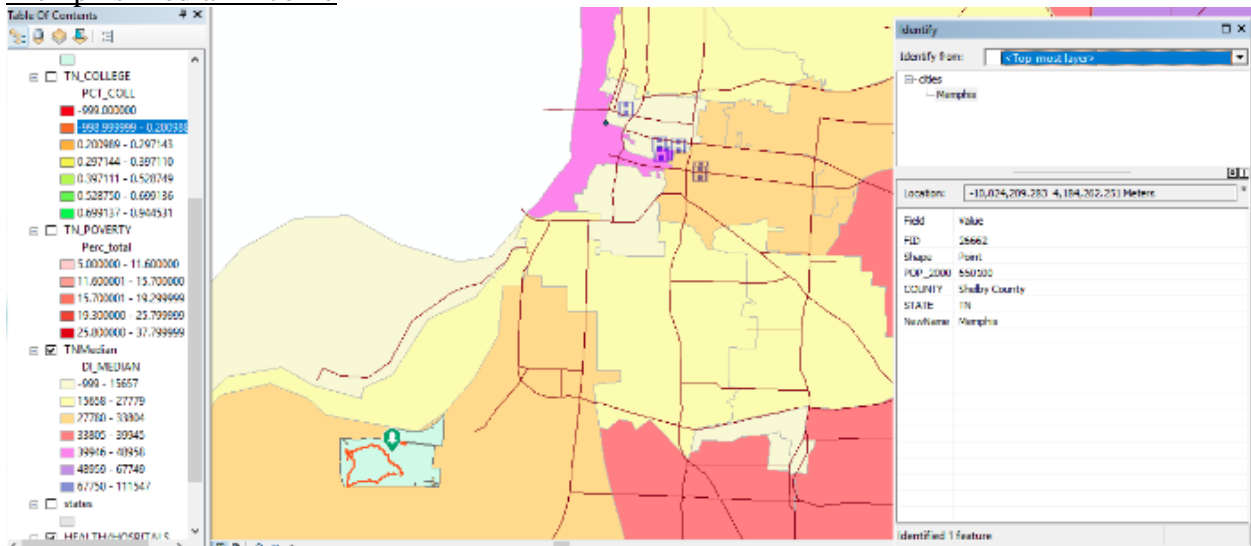
We added the data of human and natural caused wildfires from various government organizations. We did a definition query to get wildfires of just Tennessee. To compare the fault risks of Tennessee with Washington, we overlaid the state's fault lines with the wildfire layer. Lastly, we added a shapefile of the Liquefaction Susceptibility for Tennessee to Arcmap. Using the metadata we learned the significance of the darker green areas. By looking at the layers together, without using locate by attributes, we could see the greatest risk for natural disasters were on the eastern side of the state. When looking at the other measures we knew the ideal zipcode would be on the far west side of the state.

State Median Income



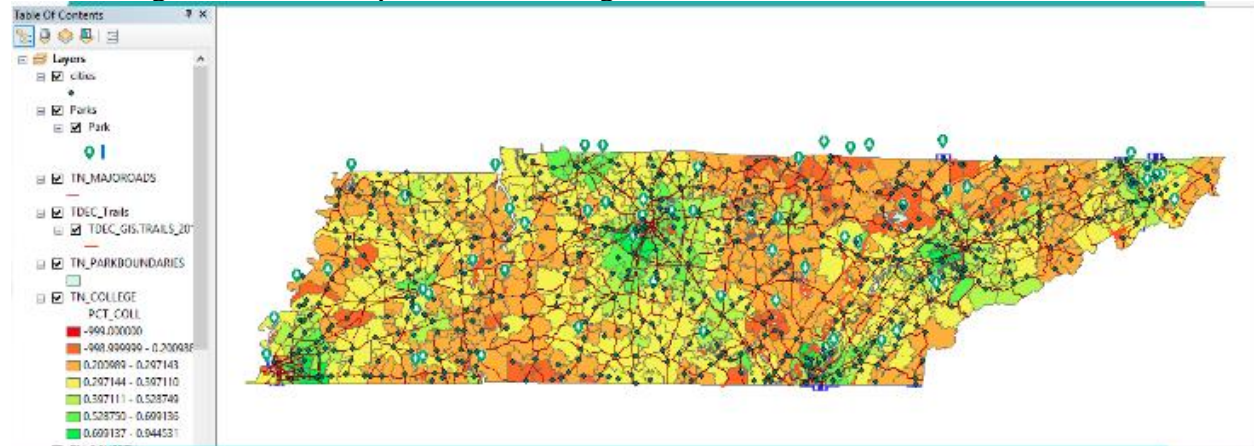
This screenshot shows the median income broken down into 7 natural break classes. As noted, we are focusing on the western half of the state due to the high livability risks in the other areas. On the western half, you can see how the lower left corner shows areas with moderate to high median incomes, so we decided to focus in on Memphis.

Memphis Median Income



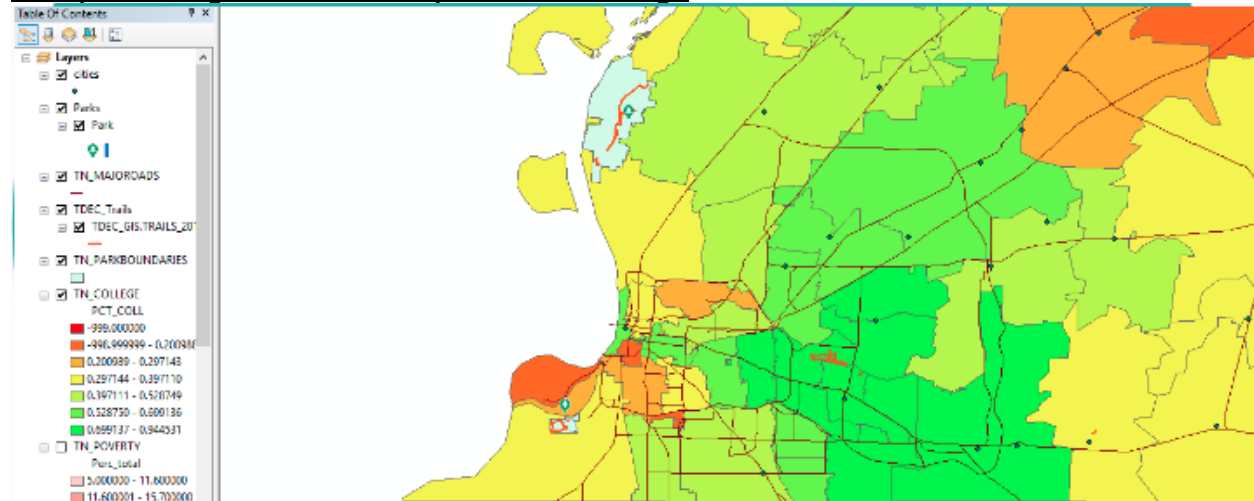
To get this image, we used the zoom function to narrow our view down to Memphis. You can see the city shaded in purple indicating that the median income ranges from about \$48,000 to about \$68,000. Having a focus on individuals in the age range of 20-30 years old, we figured that this would be a good range of median income. In this screenshot we can also see the Hospital point features in the surrounding areas of the city center.

State College Attendance Population Percentage



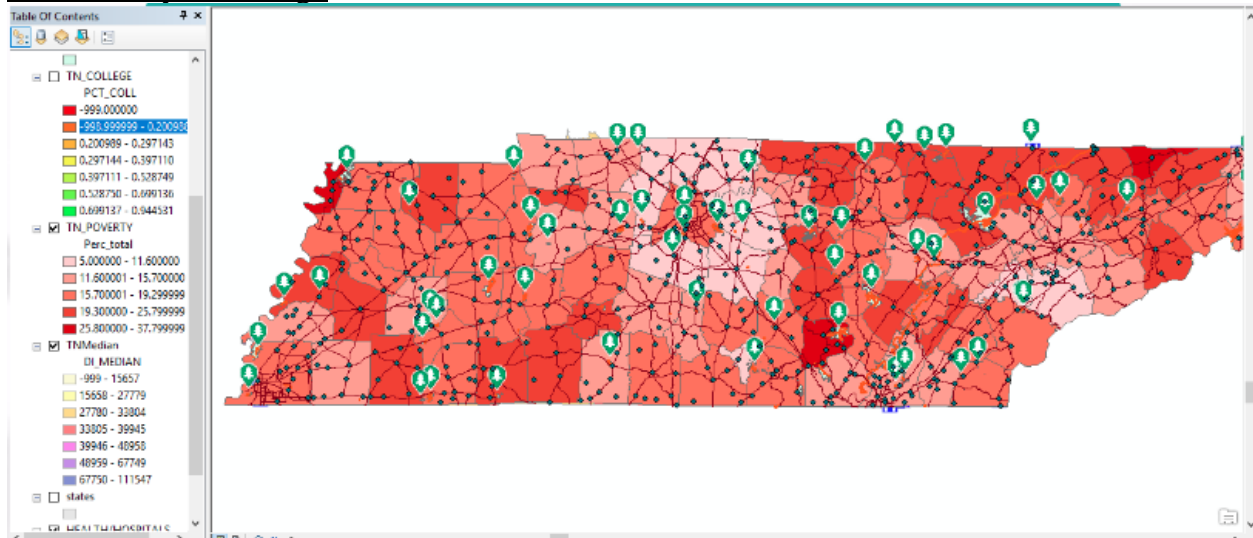
The college attendance population percentage varies throughout the state of Tennessee. Focusing on the west side, the Memphis area shows to have the highest percentage highlighted in green indicating that about 69% to 94% of the residents attended college.

Memphis College Attendance Population Percentage



Focusing in on Memphis, you can see how it has a very high college attendance percentage as well as the surrounding areas. As our target audience that we are looking for has recently graduated college, we figured that it would be best if the people they are surrounded by have also attended college. We also see state parks and trails surrounding the city indicated by the green oval point features and the thick orange lines. Using the measure and identifier tools, we identified the parks and their distance to the city center. To the north, we have Meeman Shelby park at 15 miles from the city center (to get there, you can take Thomas St. which turns into highway 52). To the south, we have Fuller State Park located only 8 miles away from Memphis (to get there you can take Harbor Ave.). To the east we have Lucious Burch Trail 15 miles away from the city center (to get there you can take Poplar Ave). As you can see, there are several options of state parks and trails that are easily accessible by the major roads.

State Poverty Percentage



This map shows an overview of the state percent poverty percentage. The Memphis area (in between the two state park point features on the bottom left corner) has about 15% to 19% poverty. Although it is not perfect, the poverty percentage is not terrible and it is surrounded by areas with a lighter shade of red indicating 11% to 15% poverty.

Conclusion

In conclusion, we determined that the best city to live in is Mount Vernon, WA. We made this choice because upon analyzing our maps, we found that Mount Vernon was a higher income area with better resources that are in closer proximity. When analyzing our conclusion, it is important to reiterate that our decision was impacted by the fact that there was not a lot of public data available for Tennessee. This has to do with the fact that Washington's state departments likely have more governmental funding.

Works Cited

<http://avricksdirect.com/homedata/?p=31>

Shapefiles and Geodatabase Feature Attribute Data Sets:

- ArcGIS Data Hub
- Department of Natural Resources
- Department of Fish and Wildlife
- Department of Financial Management
- Department of Health
- Department of Parks and Recreation
- Department of Growth Management