

Final Group Project Paper

Where Should I Move: The Big Apple or The Lone Star State

By: Nathan Binder, Shannon Scolforo, Kristina Conste, Madison Quinones

Main Goal: Determine whether New York or Texas is the better place to live.

Background

For many Americans who are looking to move, it can be very stressful. Deciding where to go can be difficult and overwhelming. A lot of factors go into whether or not a place is right for you and they are different for everyone. Most of the time, the decision is between a couple of places and you need to be able to make comparisons. Using public data and GIS software like ArcMap can significantly reduce the headache of deciding where to move. Utilizing these tools can significantly reduce the overwhelming data there is to look through by allowing the selection of certain attributes that the mover is looking for in their ideal place to move to. To demonstrate how this is done, we will be comparing four different criteria between New York and Texas. Our four criteria are based on the preferences of a audience that we created: couple that have been offered jobs in both states and they are deciding where is the best place to live. Access to nature is important to them because they enjoy being outdoors. They are also thinking about starting a family in the future and so, being close to urban services are important to them as well. It is also important to them that they live somewhere safe and nice.

Scope and Characteristics of the Study Area

- Looking at zip codes and counties across both states, New York and Texas.

Objectives

1. Access to Nature
 - a. National and State Parks within 25 mi
 - b. National and State Parks Percent Area
2. Proximity to Important services
 - a. Food access-15mi
 - b. Public schools of Grade A starting with Pre-K within 5 mi
 - c. Highest ranked hospitals with helipad within 4 mi
3. Quality of life
 - a. Life expectancy: where people seem to be living long lives
 - b. Crime Rates: less than 1,000 crimes in a county
 - c. Health Insurance: where 90% of people in the county have health insurance
4. Economic Conditions
 - a. Poverty by county: below the national average of 12.7%
 - b. Average Income by zip code: above the specific state's average income
 - c. Disposable Income by zip code: above the national average of \$44,049

Methodology

Proximity to Natural Area

The first step we took in analyzing the proximity to natural areas was identifying where national and state parks were in relation to the geometry of the two states. Once we obtained map files with this data we overlaid them on maps given to us that contained the state and zip code boundaries. The next step was to define a criteria that best expressed our indicators. The defined criteria that we developed was zip codes within 25 miles of either a national or state park. We decided on 25 miles because that was a logically reasonable distance for a day-trip to a park.

In order to develop maps for this, we used the select by location tool. Using that selection tool a layer for layer for the zip codes within 25 mi of a state park and a layer for the zip codes within 25 mi of a national park were developed. Then, in order to have a map that is easy to read, we changed some of the symbology. Upon developing maps for this, it was discovered that many of the zip codes for both New York and Texas qualified. In order to get a better idea of the true proximity people have to parks we narrowed our scope to the zip codes within 25 miles of both a national and state park. The map development process for this was similar to that of the first in that we used the same tool, select by location, except this time we searched for a location that was contained by both the layer for the zip codes within 25 mi of a state park and the layer for the zip codes within 25 mi of a national park by setting one as the source layer and one as the layer to select from. Another reason we did this was because people usually enjoy having a variety of parks to visit. This provided us with the data for this.

Another facet of the problem that we studied was the comparison of the percent area dedicated to national and state parks based on GIS files containing the park's' acreage to the total state acreage. This is a better method than just comparing the acreage of land dedicated to national and state parks because Texas is much larger than New York and therefore has an advantage if we were to directly compare total state and national park acreage.

Proximity to Important Services

The criteria I used to determine the proximity to important services was based off of three main things, food access, public schools and hospitals. Food access criteria was found by finding data on all the USDA Farmers Markets. It was important to us that we would have access to a source of fresh foods like a farmers market. A farmers market is essentially a market put on by the local community in which local farmers bring their products to be sold. Farmers markets are both helpful to the local economy as well as supplying a source of fresh food products. The data I found for USDA Farmers Markets was extremely informative listing all the days when the markets would be set up, where they will be set up based off of zip code, as well as exactly what products can be found at each market. Once the data was imported in to ArcMap, I deleted all data that wasn't important and overlaid the data with each state. Once this was accomplished, I used a 15 mile buffer around each USDA Farmers Market. The next criteria found was all of the public schools within the US. Once this data was obtained, I narrowed it down using select by attributes and select by location to only show public schools within each target state that had a school rank A and offered Pre-K. Next, I used a buffer of 5 miles around the new selection and saved it as its own layer. Data on all Hospitals in the US

was found and narrowed down using the select by attributes to only show hospitals in each target state. Next, I used select by attributes again to select only the highest ranked hospitals that had access to a helipad within each state. And finally I used the buffer tool to establish a 4 mile buffer around this selection.

Being close to all three criteria was important in determining the best place to live which is why the buffers may seem small but, with that being said there was still a lot of data for each criteria. The next step I took was determining where all of these criteria intersect. To do this, I used the select by location tool to show where the hospitals selection intersects with the public schools selection. A new layer was created based off this and a final select by location was used to show where USDA Farmers Markets intersect with the hospitals and public schools selection. A final new layer was created showing the intersection of all three of these criteria by zip code.

Quality of Life

Public, demographic and socioeconomic, GIS data was collected from various sources. We determined that life expectancy of residents, percent of residents with health insurance, and crime rates, were the best criteria to represent quality of life for each county within each state. Once the data was found and edited, the data was brought up in ArcGIS. From there, further edits were carried out to make sure that the data for each criteria matched and were able to be joined together into one cohesive table. Lastly, maps were made for each criteria by using a gradient to show the different quantities of each criteria, in each county.

In addition, we determined the requirements our criteria had to meet to represent the quality of life of each county within each state. First, life expectancy for each county was required to be made up of more than 15% of residents being 65 years and older. Second, percent of residents with health insurance for each county was required to be more than 90%. Lastly, crime rates for each county was required to be less than 1,000 crimes. Once the requirements were determined, we were able to select for these requirements in the attribute table for each map and highlight the counties that met each criteria. From here, we calculated the number of counties with data available and the number of counties that met each criteria for both states, to determine where is the best place to live in terms of quality of life.

Economic Conditions

Data regarding economic conditions within the United States was collected from the census website. The two pieces of data that were analyzed were the average income in each zip code and the percentage of poverty within each county in Texas and New York.

First, the average income shapefile was imported into ArcMap. Once this layer was imported, the zip codes within New York and Texas were selected, and a new layer was created from each of these two states. The reason why two separate layers were made was because the cost of living in each state is different, so the desired zip codes should have a different minimum average income for each state. In New York, a color gradient was created based on the average income and separated into four classes. The desired zip codes were considered as

any zip code with an average income over \$60,850. The same process was done with Texas, but the desired zip codes were considered as any average income over \$55,653. In both states, a zip code was judged as desirable to move to if the zip code had an average income that was greater than the average income for that state.

The next shapefile imported was the poverty by county. The same process of selection was made to isolate New York and Texas in different layers. From there, a color gradient was created using 12.7% since it is the national poverty rate. Any county that had a poverty rate below 12.7% was considered desirable for the people discussed in the background.

Disposable Income by zip code was the last shapefile used, and the same previously stated process was done. For this layer, the zip codes that met the criteria were any zip codes that had a disposable average income that is greater than the national average, which is \$44,049.

Once the areas that met the criteria in each category were found, the clip geoprocessing feature and select by attributes tool were used to find the zip codes that were within a low poverty county and had a high enough average income and disposable income to meet the criteria.

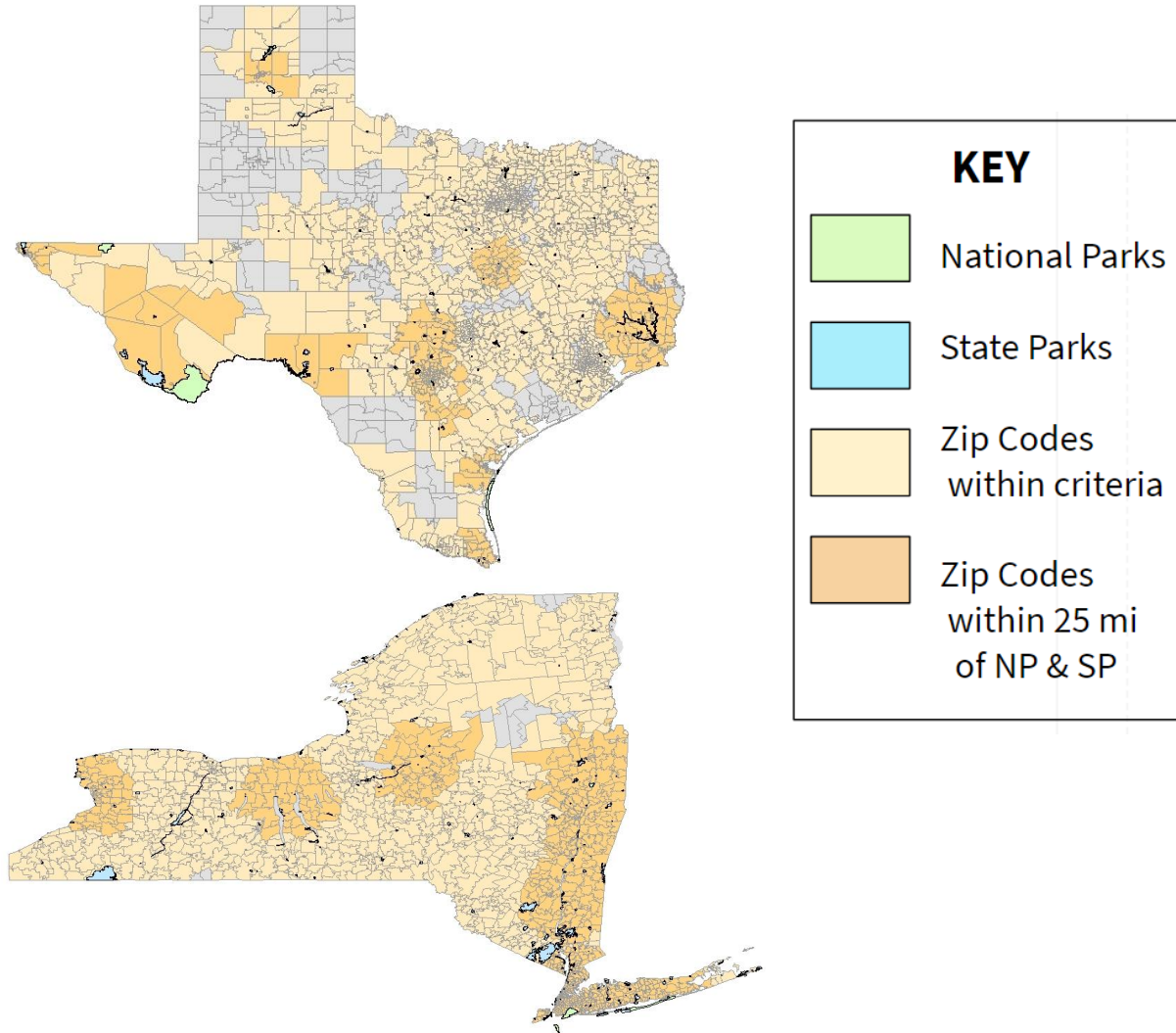
Results and Discussions

Proximity to Natural Area

The main criteria that we set was zip codes within a 25 mile radius of either a national or state park. Upon creating maps for this criteria we found that 1,419 of the 1,596 zip codes for New York and 1,472 of the 1,755 zip codes for Texas qualified for this criteria. These findings were interesting in that both New York and Texas had about the same amount of qualifying zip codes even though Texas is much larger than New York. Our second phase of analysis led us to look at zip codes within 25 miles of both a national and state park. This narrowed our search down to 971 zip codes for New York and 314 zip codes for Texas.

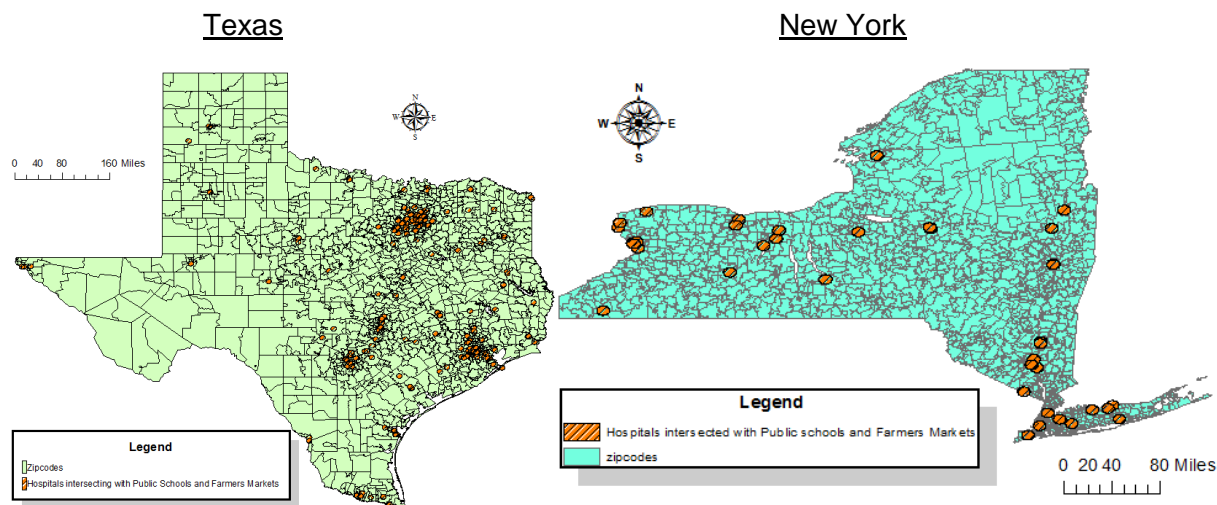
The secondary aspect we studied was the percent area of national and state parks compared to the state's total area. For New York, the land dedicated to national parks is 72,674 acres and to state parks is 1,016 acres. New York is 171,891,725 acres in total. This gives a percent area of 0.043%. For Texas, the land dedicated to national parks is 1,244,635 acres and to state parks is 628 acres. Texas' total land area is 34,915,840. This gives a percent area of 3.57%. This conclusion was very intriguing in that even though Texas has more percent land designated to national and state parks, it did not fit our criteria as well as New York did. Our hypothesis for this phenomenon is that although Texas' national and state parks are larger there are less of them than in New York. This was confirmed through research that New York has 21 national parks and 857 state parks whereas Texas has 14 national parks and 119 state parks.

The maps below are the finalized maps showing the indicators for proximity to nature:



Proximity to Important Services

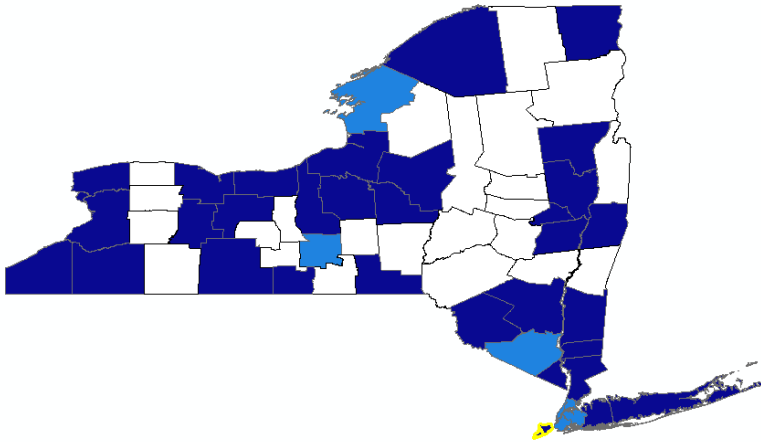
_____ Although Texas has a much higher land area than New York the number of zip codes in each state were relatively close. Texas has a total of 1755 zip codes and New York has a total of 1596 zip codes. The number of highest rated hospitals that had access to a helipad within a proximity of 4 miles accounted for 225 zip codes in Texas and 117 zip codes in New York. The number of public schools with a rank A containing at least Pre-K within a proximity of 5 miles accounted for 1369 zip codes in Texas and 387 zip codes in New York. And finally the number of USDA Farmers Markets within a 15 mile radius accounted for 169 zip codes in Texas and 675 zip codes in New York. My data found was straight forward once I gathered all the necessary data. The hardest part by far was finding all the data where I then was able to narrow it down based upon my specifications. Based off of my data alone, Texas offers more options to live that meet all my criteria when compared to New York. Texas had 157 suitable zip codes for living while New York only had 38 viable zip codes. The maps below show the exact places where all the criteria are met and suitable for living.



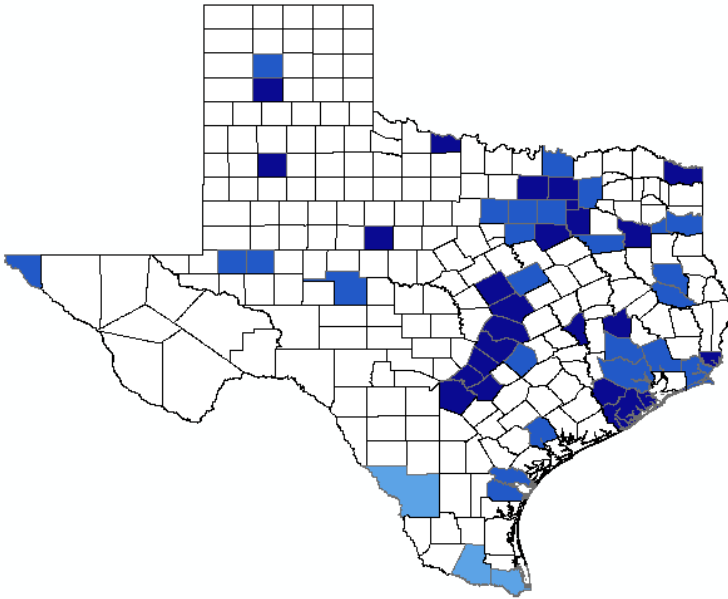
Quality of Life

To begin with, the number of counties in each state and the number of counties that had data available for each criteria. New York has 62 counties however, only 58 counties had data on crime rates and only 38 counties had data on percent of residents that are 65 years and older and percent of residents with health insurance. Texas has 254 counties however, only 251 counties had data on crime rates and only 53 counties had data on percent of residents that are 65 years and older and percent of residents with health insurance. In addition, the number of counties in each state that met each criteria. New York had one county, Richmond, that had less than 1,000 crimes, more than 15% residents that are 65 years and older, and more than 90% of residents with health insurance. Texas did not have a county that met each criteria.

It is important to consider the significant difference in number of counties between New York and Texas. This difference can bias the results. New York has fewer counties than Texas however, the ratio of number of counties and number of counties with data available, in New York, is more proportional than Texas. This can cause the results to bias in favor of New York. Furthermore, it is important to consider that data was missing from a lot of counties in both states for percent of residents that are 65 years and older and percent of residents with health insurance. This is a problem because, the data does not represent each state as a whole. There could be more counties that meet each criteria, in each state, then we found with the data that was available.



Map of New York showing the county that meets all of the criteria for quality of life.



Map of Texas showing the county that meets all of the criteria for quality of life.

Economic Conditions

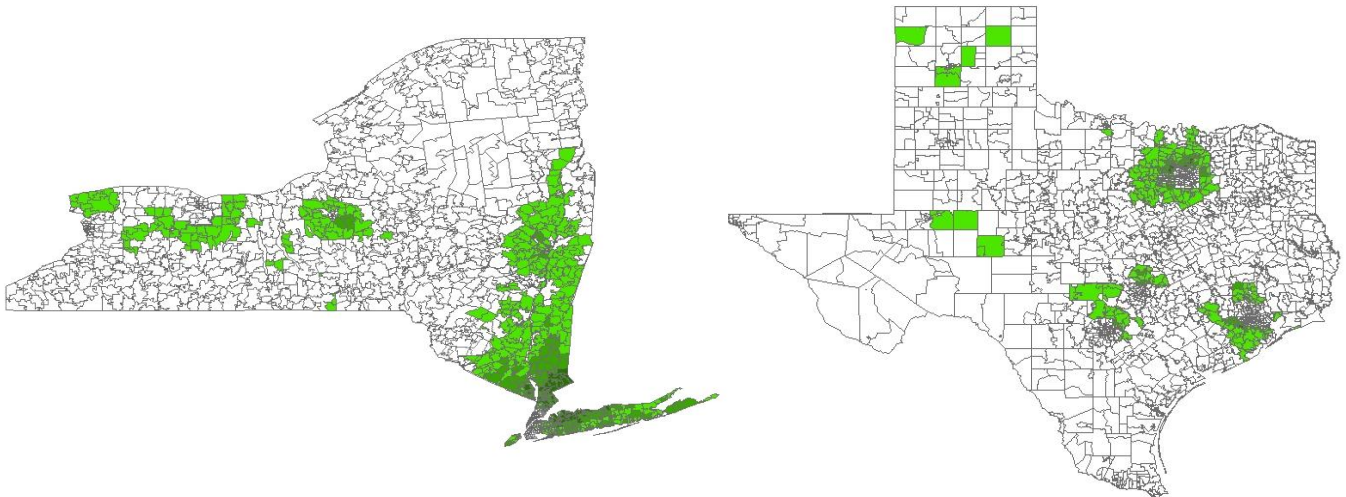
_____ After going through the economic conditions criteria, it became evident that there is a lot of zip codes within both states that have a high percentage of poverty and a low average income. The first criteria that was imported was the shapefile for average income by zip code. When a selection was made that discounted any zip code that fell below the average income level, only 1,477 of the 3,479 zip codes were qualifying.

From there, the qualifying zip codes kept decreasing as the poverty layer and disposable income layer were imported. As the other layers were added, a selection was made to only select zip codes that met all of the economic criteria. By the end of the process, only 638 zip

codes in New York met all of the criteria, and only 349 zip codes in Texas met all of the criteria. This means that out of the initial 3,479 zip codes, only 987 were below the national poverty level and above the national average disposable income level and the state average income level.

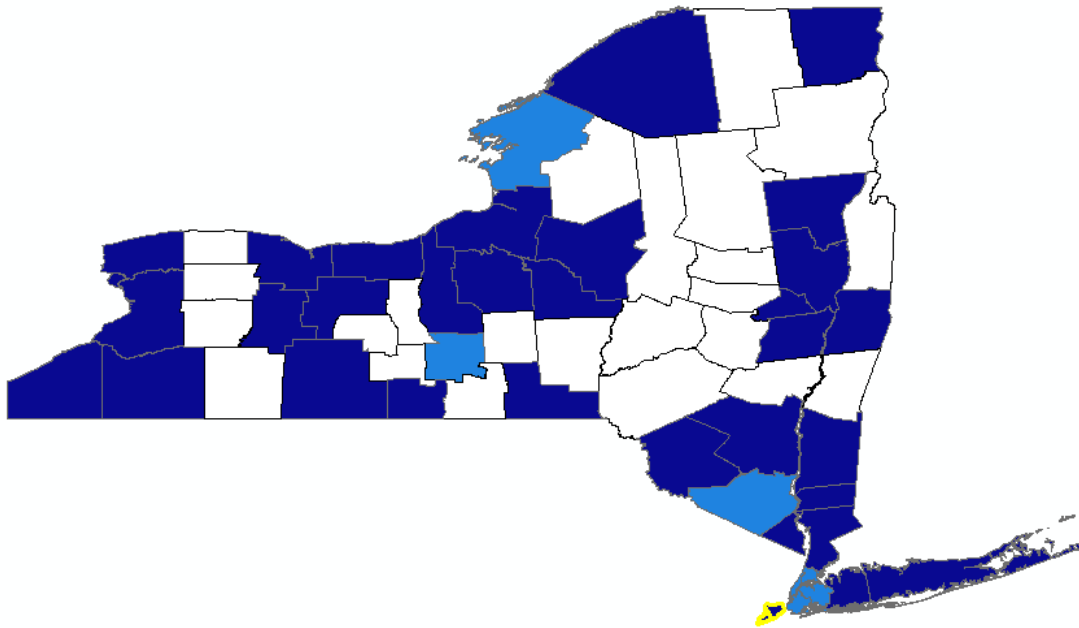
It was interesting to see how the areas with high average income and high average disposable income were clustered near large cities such as New York City, Buffalo, Dallas, Austin, San Antonio and a few other large cities. However, the even more interesting part was that although the areas surrounding the cities were all qualifying zip codes within the economic conditions criteria, the zip codes actually within the cities did not qualify. All of the zip codes within the cities showed to have higher percentages of poverty and lower levels of income. Therefore, the best areas to live regarding economic conditions are areas surrounding large cities.

Final maps that indicate all zip codes that met all of the economic conditions criteria:



Conclusions

After discovering that there was only one county; Richmond, NY; that qualified for our quality of life criteria, we then took a look at if that county qualified for the three other topics we covered. Upon review, we found that all the zip codes within the Richmond, NY qualified for all of our economic, proximity to nature, and proximity to important services criteria. Therefore, based on our indicators, the best place to live is Richmond, New York which is also known as Staten Island. The map below shows Richmond, New York highlighted.



Resources

GIS data for National Park Boundaries:

<https://irma.nps.gov/DataStore/>

GIS data for TX State Park Boundaries:

<http://tpwd.texas.gov/gis/>

GIS data for NY State Parks Boundaries:

<https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=430>

Data on Acreage of National Parks:

<ftp://ftp.census.gov/library/publications/2010/compendia/statab/130ed/tables/11s1253.pdf>

Census Data on Parks and Recreation for 2000:

<https://www.census.gov/prod/2001pubs/statab/sec07.pdf>

USDA Farmers Market:

<https://www.arcgis.com/home/item.html?id=153c17de00914039bb28f6f6efe6d322>

Public Schools:

<http://schoolsdata2-tea-texas.opendata.arcgis.com/>

Hospitals:

<https://www.arcgis.com/home/item.html?id=f114757725a24d8d9ce203f61eaf8f75>

Census Data on Poverty Rates

<https://www.census.gov/topics/income-poverty/poverty.html>

Data on Size and Population of every state:

<http://www.ipl.org/div/stateknow/popchart.html>

GIS data for NY-Age expectancy and health insurance

https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_1YR_S0201&prodType=table

GIS data for Texas-Age expectancy and health insurance:

https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_1YR_S0201&prodType=table

GIS data for NY and Texas-crime rates:

<https://www.census.gov/library/publications/2010/compendia/databooks/crime.html>

Income data for NY and Texas

<http://www.deptofnumbers.com/income/>