URP4273 FINAL PROJECT

Demographic & Socio-Economic Profiles and US Populations in a Spatial Context relating to the 2016 Presidential Elections

GROUP 4

Cara Walkover

Gaby Placido

Mark Rumenik

Nicholas Bauer

Contents

MAIN GOAL

The aim of our project is to determine the relationship between Bernie Sander's campaign contributors and their level of education attainment, economic conditions, and political background, as well as the patterns and variance among these demographics. The three measures will be analyzed by the following indicators: average annual income, age, sex, race, college degree attainment, population density, cost of living, crime rate, immigration (foreign born or not), state political party affiliation, and profession (blue collar or white collar). We will be examining these factors in New York and Florida, two vital swing states. New York and Florida are both states that are home to one of the largest densities of people in the United States, but they overall contrast in political beliefs and values. While New York has traditionally been a blue, liberal, Democratic state, Florida has historically been a red, conservative, overall Republican state. The politics of Florida are very interesting to analyze in comparison to other states; between its significant differences in population densities among its large proportions of rural areas versus its densely populated large cities, and its active settlement rates from other states and countries, it is host to a mix of many various demographics and both political party affiliations. Obtaining and evaluating these measures and indicators of information from these two contrasting states will enable us to achieve our goal of discovering significant variables and trends behind the history-changing benefactors of Bernie Sander's political campaign.

BACKGROUND

Our problem statement is based off the data we were given for Bernie Sanders donors. The data was not on specific donors, but rather various monetary and numerical portrayals for individual zip codes. The primary problem statement was to find a useful way to categorize this information in conjunction with our indicators. The indicators were chosen based on what we felt would offer valuable findings when compared to the Sanders data. Once our maps were assembled, we found out in what way our indicators matched donor data. Then we assigned our most "concrete" indicators to the categories we developed. The categories are groups of people meant to display terms of greatest to least likely to support. These categories would be similar to what is used in campaign applications when campaign teams are trying to find out where and to whom they should focus their time on. These categories will help draw conclusions to our cartographically intelligent maps.

SCOPE OF THE STUDY AREA

Our study focused on measures and indicators that we felt were most appropriate to Bernie Sanders and the demographics that were most likely influenced politically by his campaign, such as those in the United States who had higher levels of education and income, those in more heavily populated areas, and such as those in Democratic areas.

ECONOMIC MEASURES

- Average Annual Income
- Population Density
- Cost of Living

DIVERSITY MEASURES

- Age
- Gender
- Race
- Immigration Rate (foreign-born or not)
- Political Party Affiliation

COMMUNITY MEASURES

- College Degree Attainment
- Crime Rate
- Presence of Non-profit Organizations

OBJECTIVES

Our objective was to overall detect relationships between Bernie Sanders' campaign donors and the socio-demographic data we assessed, determining who these donators are, and which of these selected demographics had the most donations and the highest paying donations. Three measurement categories were selected for inquiry: education attainment, economic conditions, and political background.
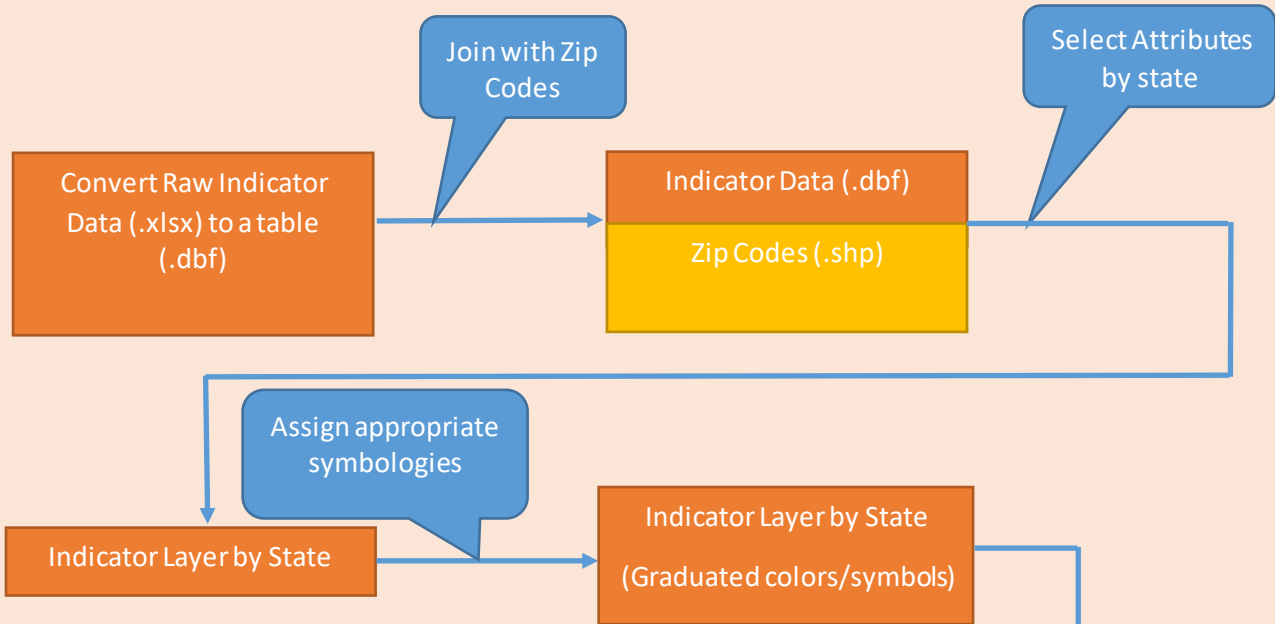
We first created a Geospatial Data Library of our selected indicators by obtaining publicly available data on such demographics through accessible sources such as nhgis.org and the United States Census Bureau. We then standardized and "cleaned" the data we chose to use, such as by converting the raw indicator data, some of which was in excel format, into tables (such as .dbf formats) and into formats that can be put into ArcGIS, such as layer (.lyr) and shapefiles (.shp). The indicator data, in .dbf format, was joined with a shapefile of zipcodes. This enabled us to then trim out the other states that were not New York and Florida, which was done by going to "Select by Attributes" in ArcMap and specifying only our states of interest with the unique values option. We similarly selected raw donor data for each state, cleaned it up, and assigned it to the same layer frame to get indicator layers by state that demonstrate both donor and indicator data simultaneously.

In this way, we were able to spatially evaluate the data by putting it into cartographically intelligent maps and flow charts. Putting the data into these formats gave us visual representations that we could better understand in order to assess the correlations between the data and Bernie Sanders donors. We anticipated that the indicators chosen for our
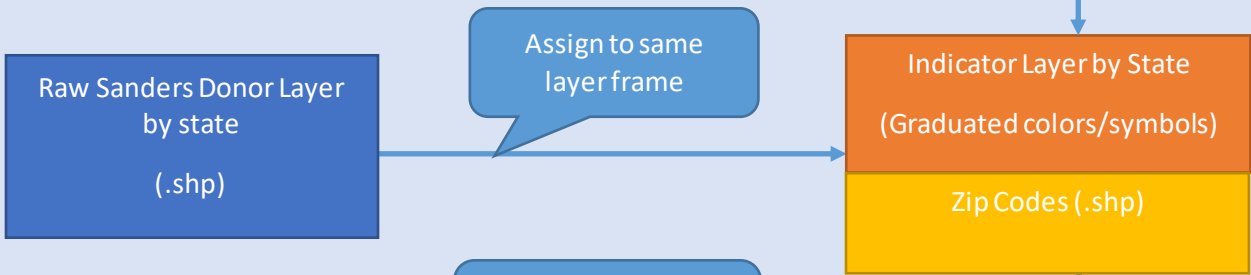
study would provide positive correlations with Bernie Sanders donation information, but we also hoped to discover unexpected and unrealized correlations that his donors may exhibit, in the event that there were unrecognized demographic(s) that contributed to his campaign.

METHODOLOGY

INDICATOR ANALYSIS

Convert Raw Indicator Data (.xlsx) to a table (.dbf)

Join with Zip Codes

Indicator Data (.dbf)

Zip Codes (.shp)

Select Attributes by state

Assign appropriate symbologies

Indicator Layer by State

Indicator Layer by State (Graduated colors/symbols)

DONOR ANALYSIS

Raw Sanders Donor Layer by state (.shp)

Assign to same layer frame

Indicator Layer by State (Graduated colors/symbols)

Zip Codes (.shp)

LAYOUT FORMATTING

Assign Base Map & Legend

Sanders Donor Layer & Indicator Layer
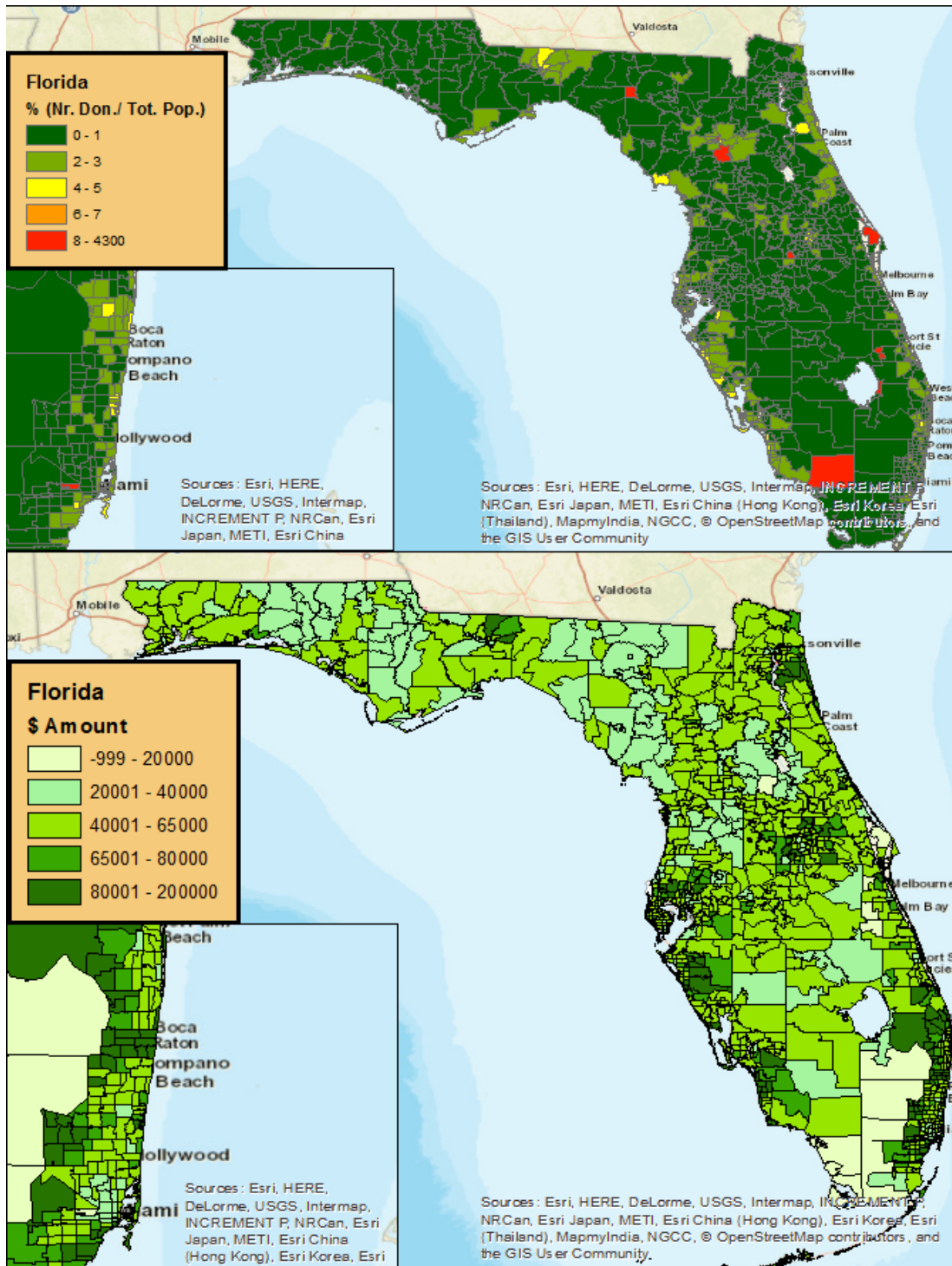
Sanders Donor Layer & Indicator Layer

Figure 1a. AVERAGE INCOME: showing average income compared to Sanders donations in the state of Florida. Sanders donations are shown by number of donations divided by the total population by zip code.
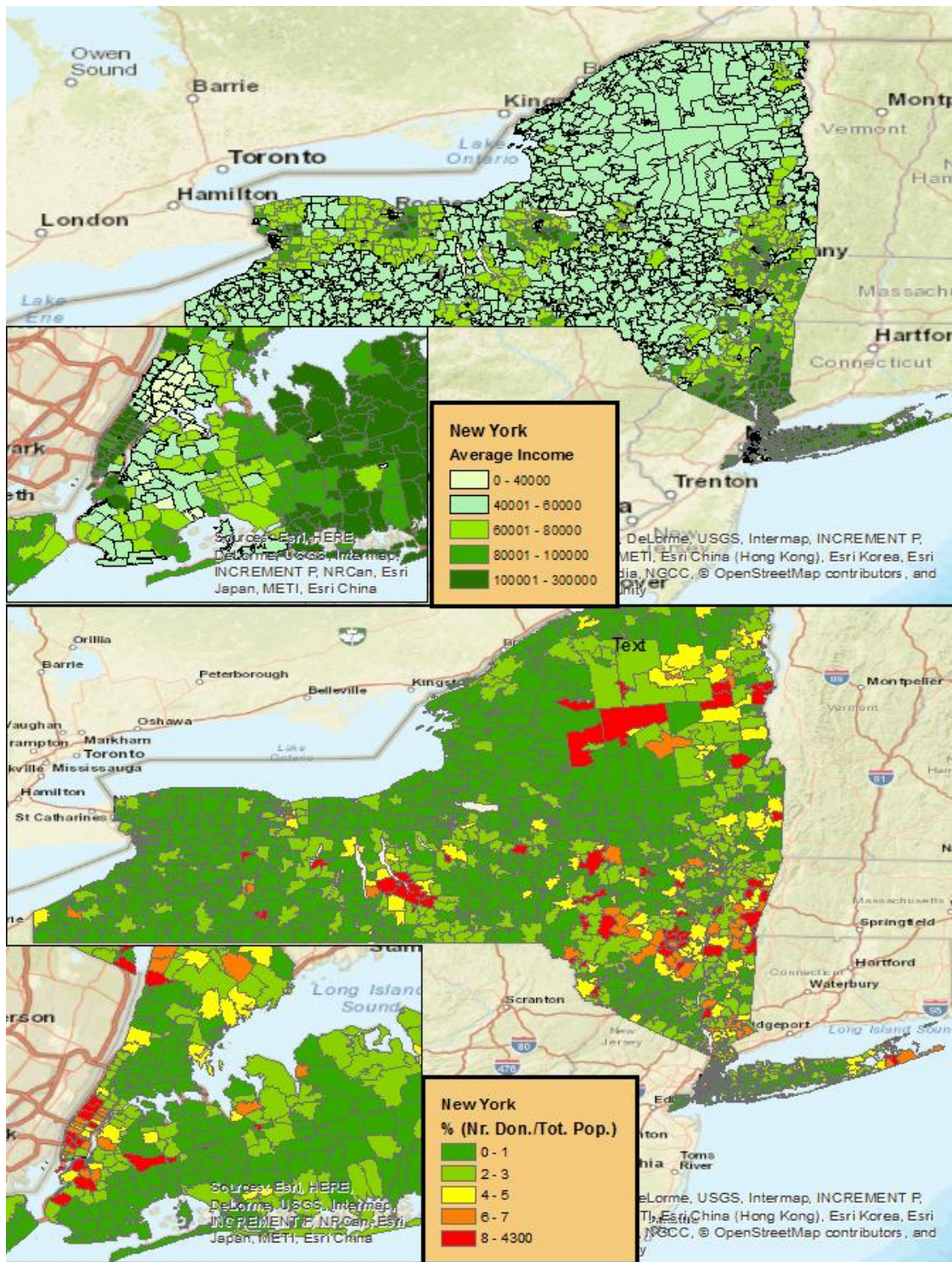
Figure 1b. AVERAGE INCOME: showing average income compared to Sanders donations in the state of New York. Sanders donations are shown by number of donations divided by the total population by zip code.
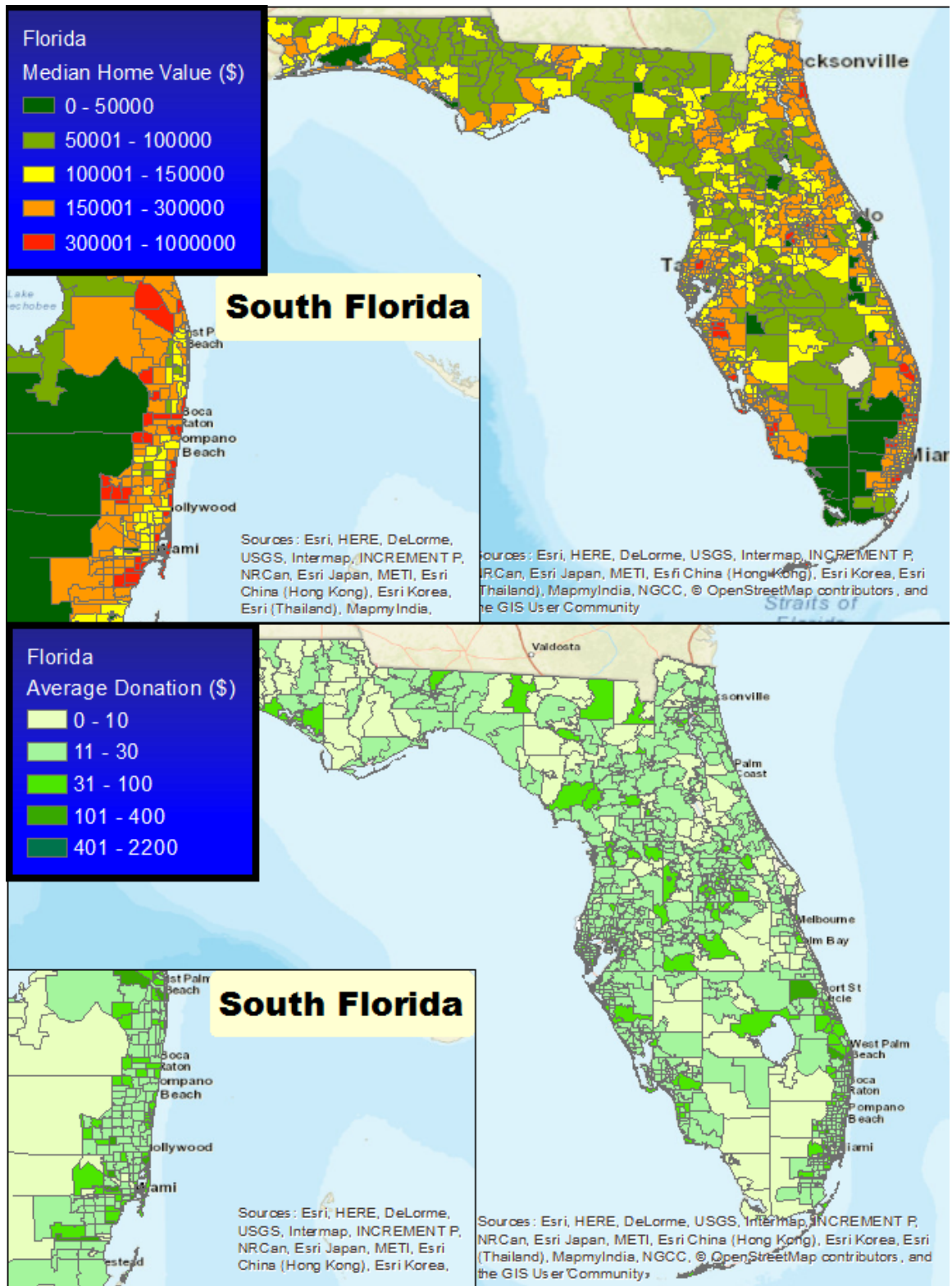
Figure 2a. MEDIAN HOME VALUE: showing median home value compared to Sanders donations in the state of Florida. Sanders donations are shown by the average donation amount per zip code.
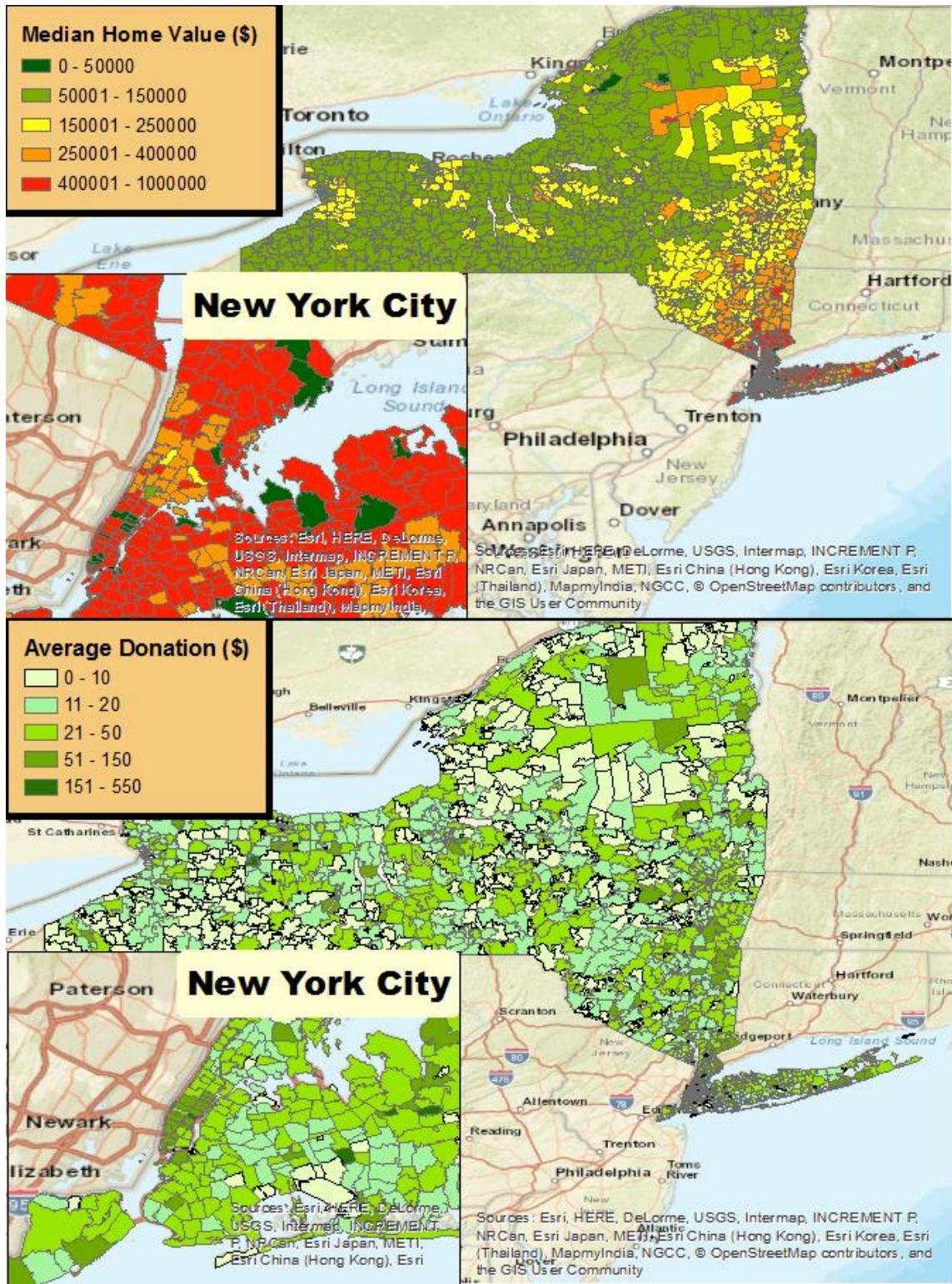
Figure 2b. MEDIAN HOME VALUE: showing median home value compared to Sanders donations in the state of New York. Sanders donations are shown by the average donation amount per zip code.
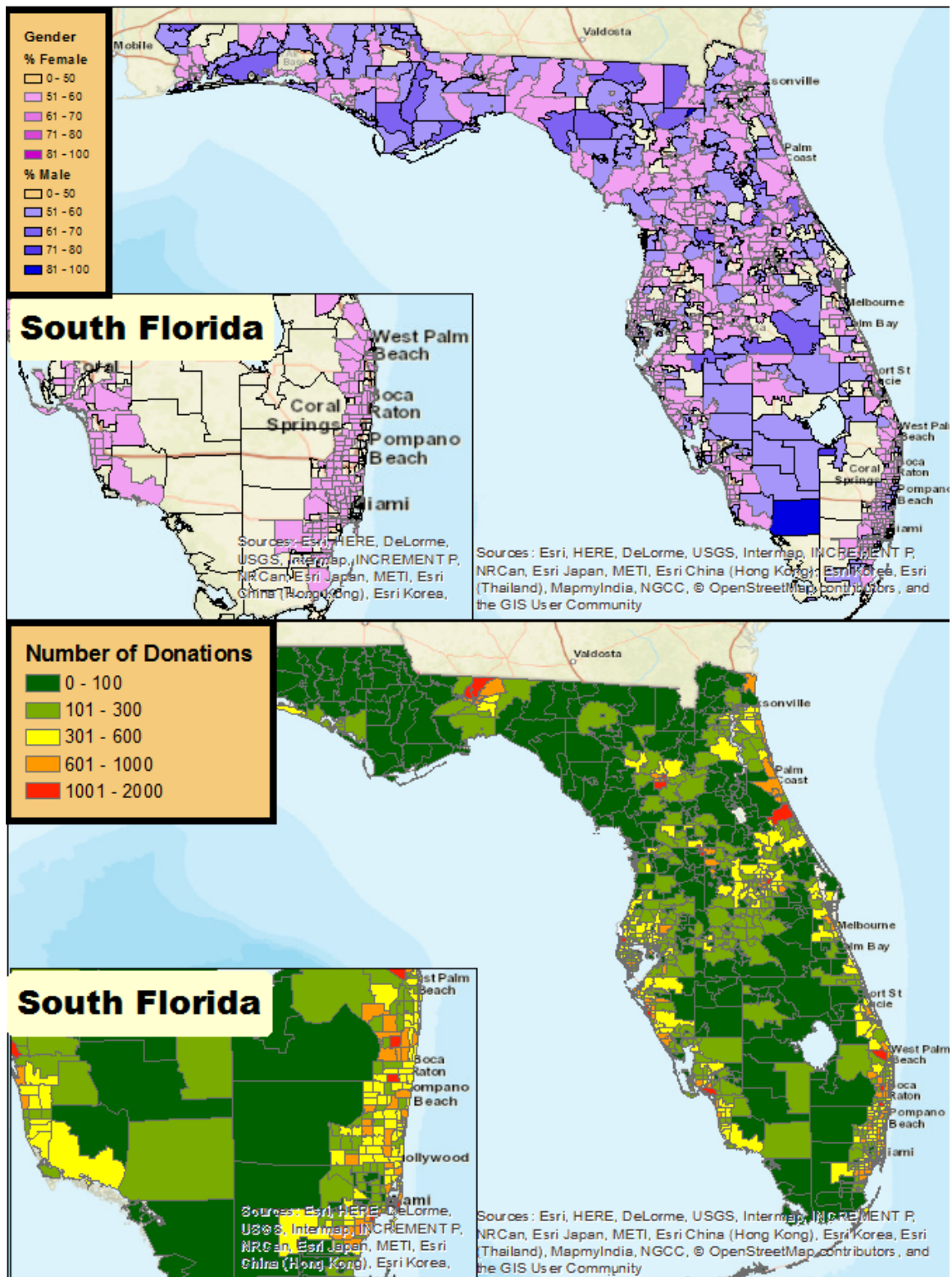
Figure 3a. GENDER: showing gender majorities compared to Sanders donations in the state of Florida. Sanders donations are shown by the number of donations per zip code.
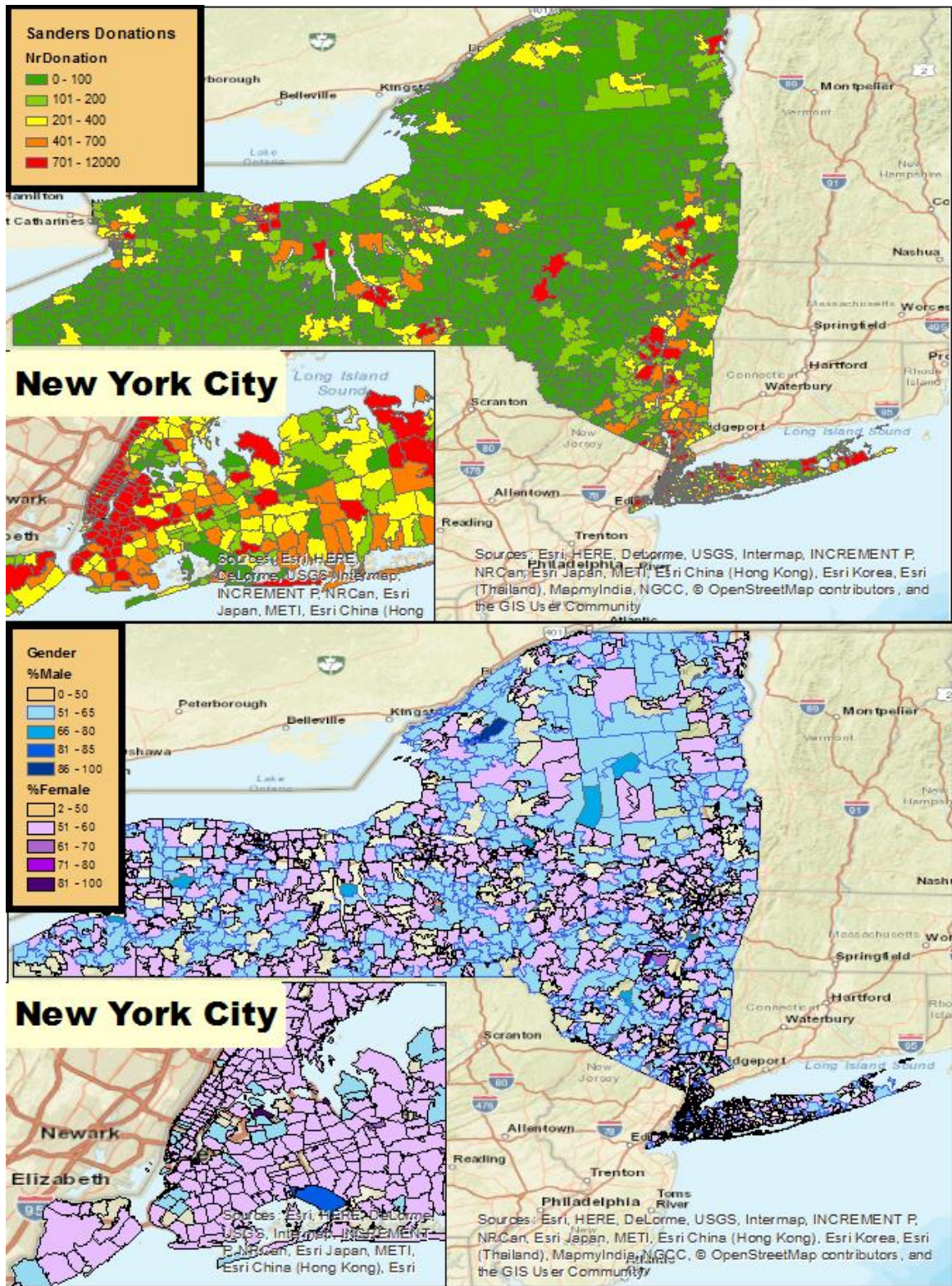
Figure 3b. GENDER: showing gender majorities compared to Sanders donations in the state of New York. Sanders donations are shown by the number of donations per zip code.
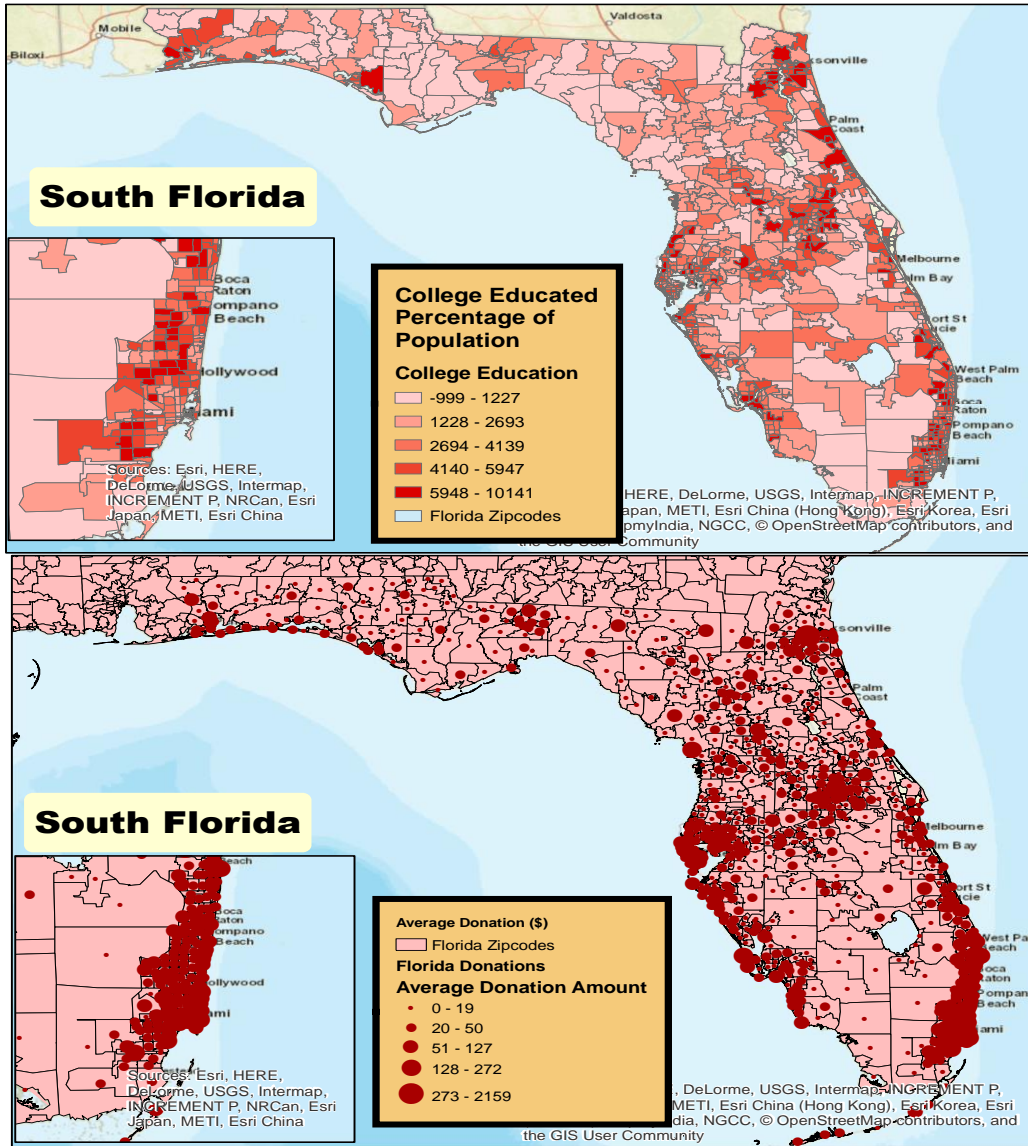
Figure 4a. EDUCATION: demonstrating the percentage of the population that is college educated in the state of Florida (above), in comparison to financial contribution to Sanders' campaign(below).
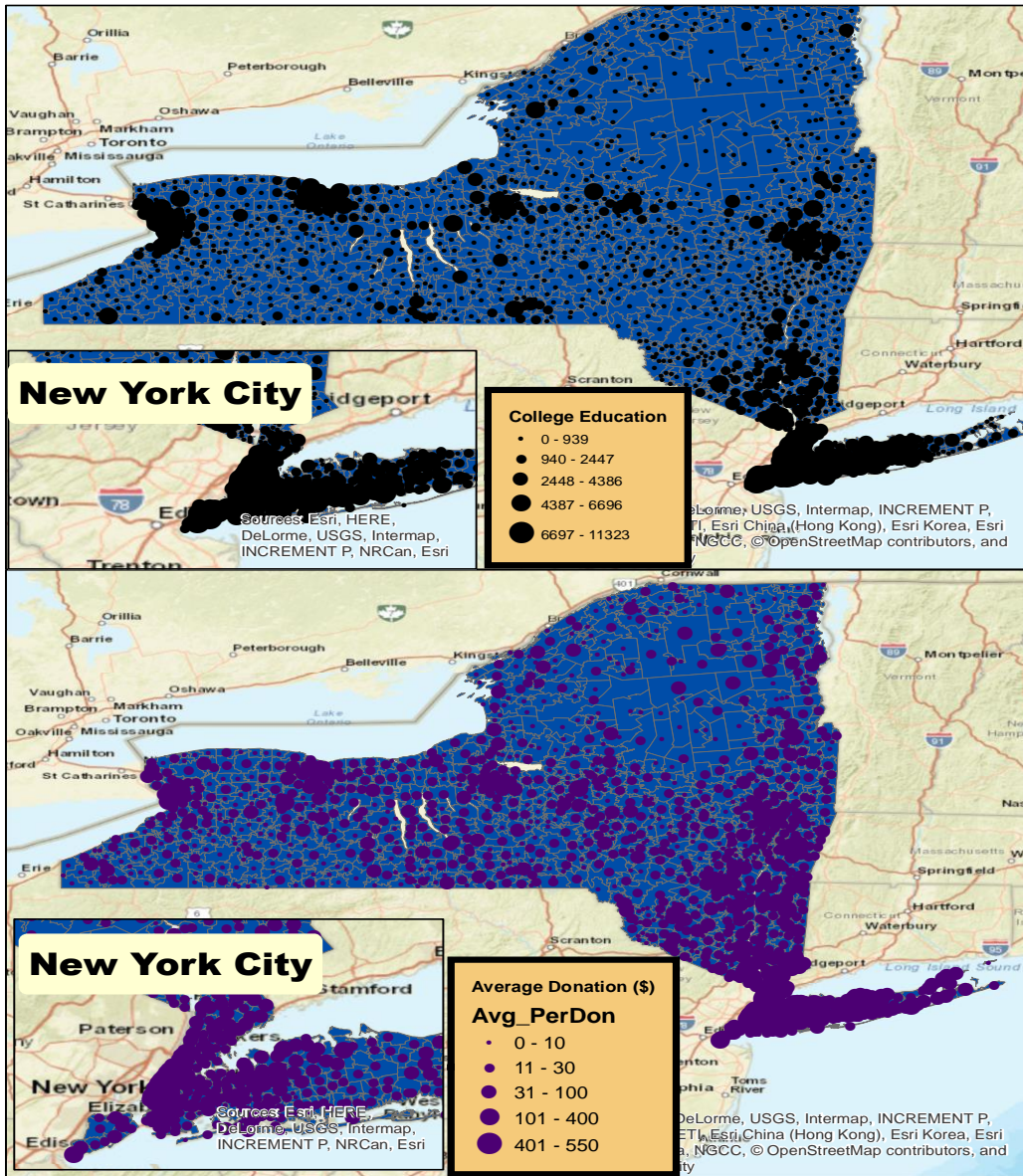
Figure 4b. EDUCATION: demonstrating the percentage of the population that is college educated in the state of New York (above), in comparison to financial contribution to Sanders' campaign (below).

Figure 5a. IMMIGRATION: demonstrating the number of foreign born persons in the state of Florida (above), in comparison to financial contribution to Sanders' campaign(below).
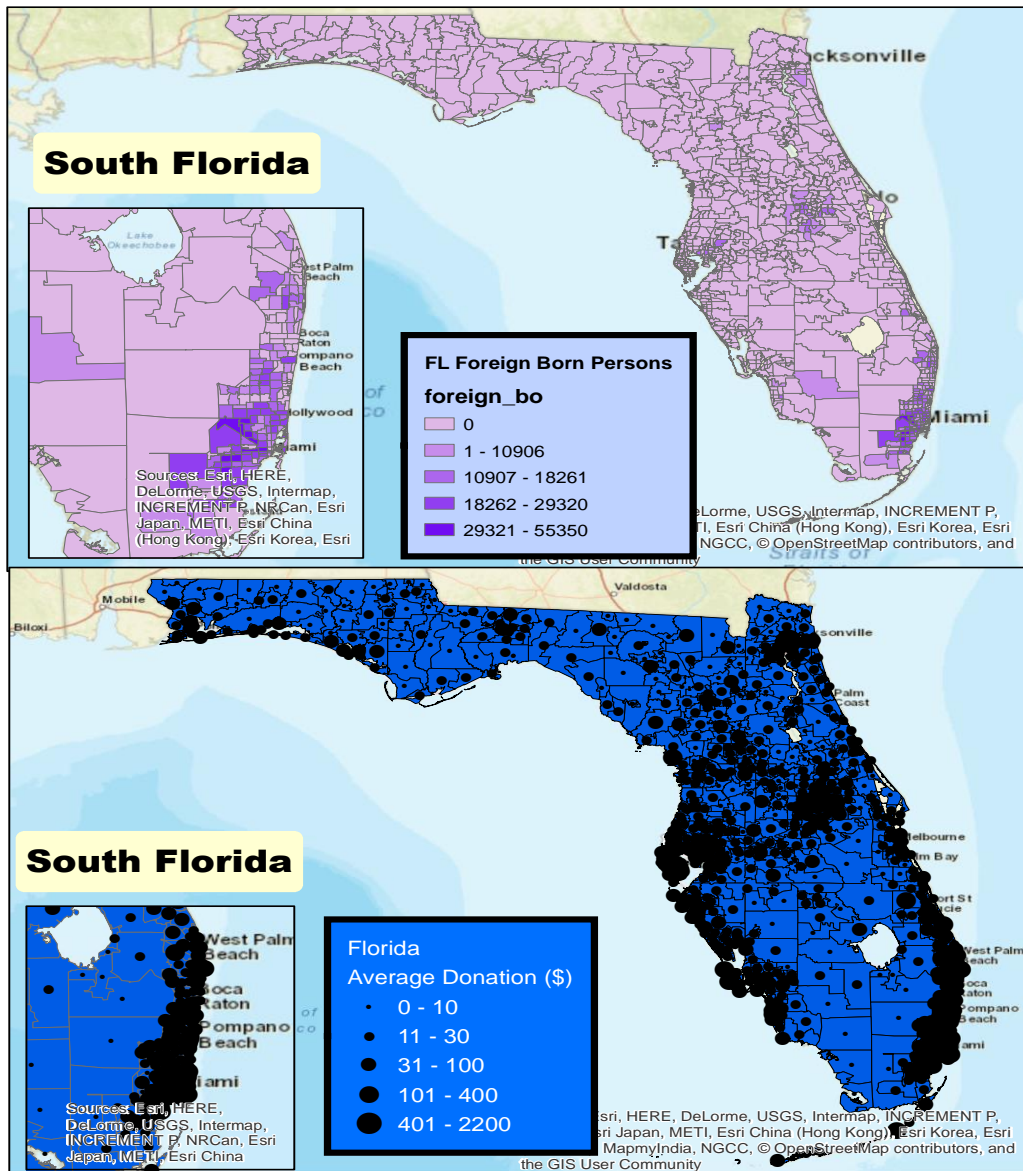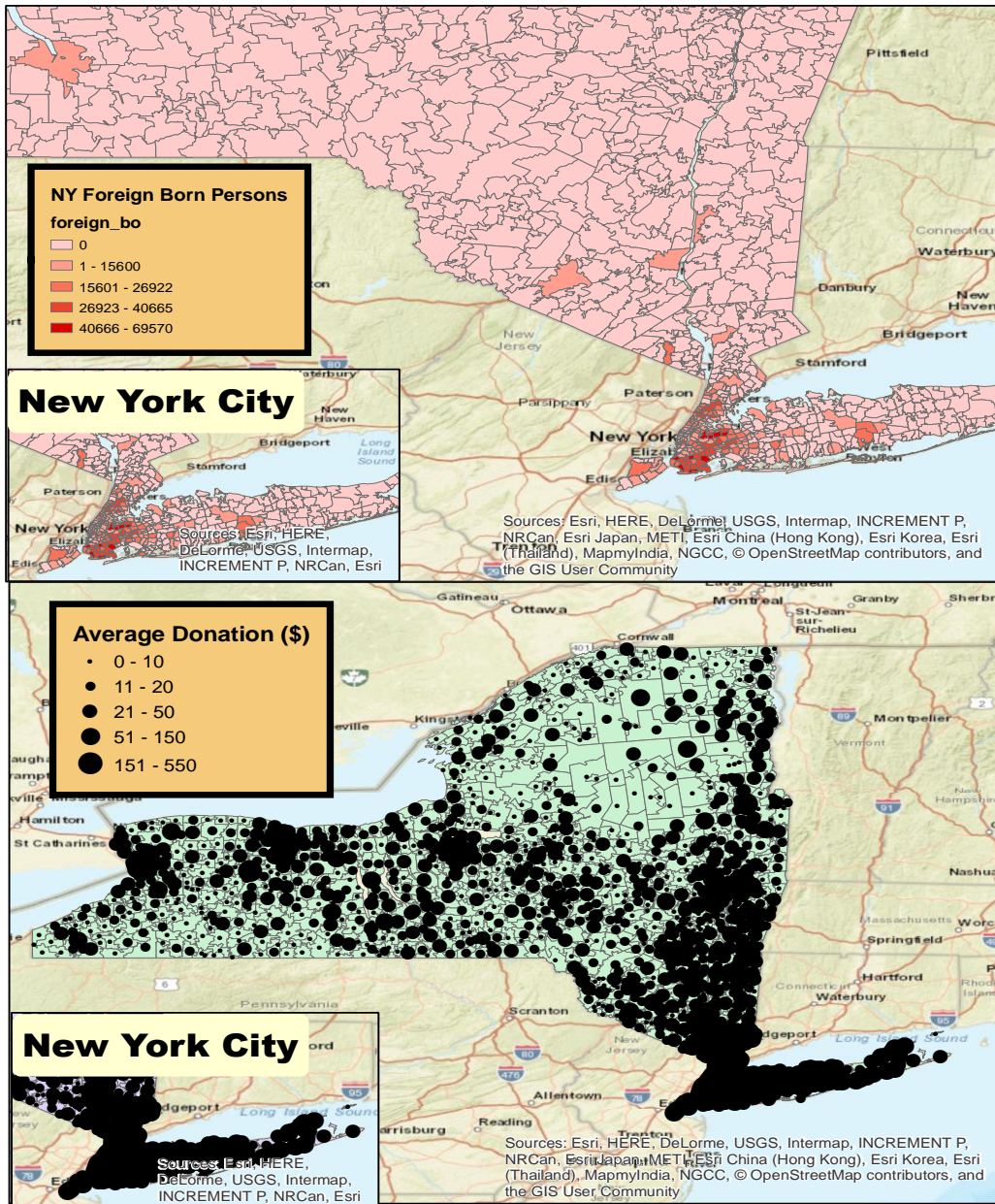
Figure 5b. IMMIGRATION: demonstrating the number of foreign born persons in the state of New York (above), in comparison to financial contribution to Sanders' campaign(below). The above window has been highly zoomed into because the rest of the state did not exhibit any noticeable immigration for analysis.

Amount of Bernie Sanders Donations in Respect to the Political Standing of Florida Counties

Legend
Total Donation Amount
TotalAmnt
- 0 - 4675
- 4676 - 11928
- 11929 - 23040
- 23041 - 51744
- 51745 - 125222

Political Standing
color
- Democrat
- Republican

Amount of Bernie Sandes Donations in Respect to the Political Standing of New York Counties

Legend
Total Donation Amount
TotalAmnt
- 0 - 8421
- 8422 - 30473
- 30474 - 98280
- 98281 - 241893
- 241894 - 392245

Political Standing
color
- Democrat
- Republican

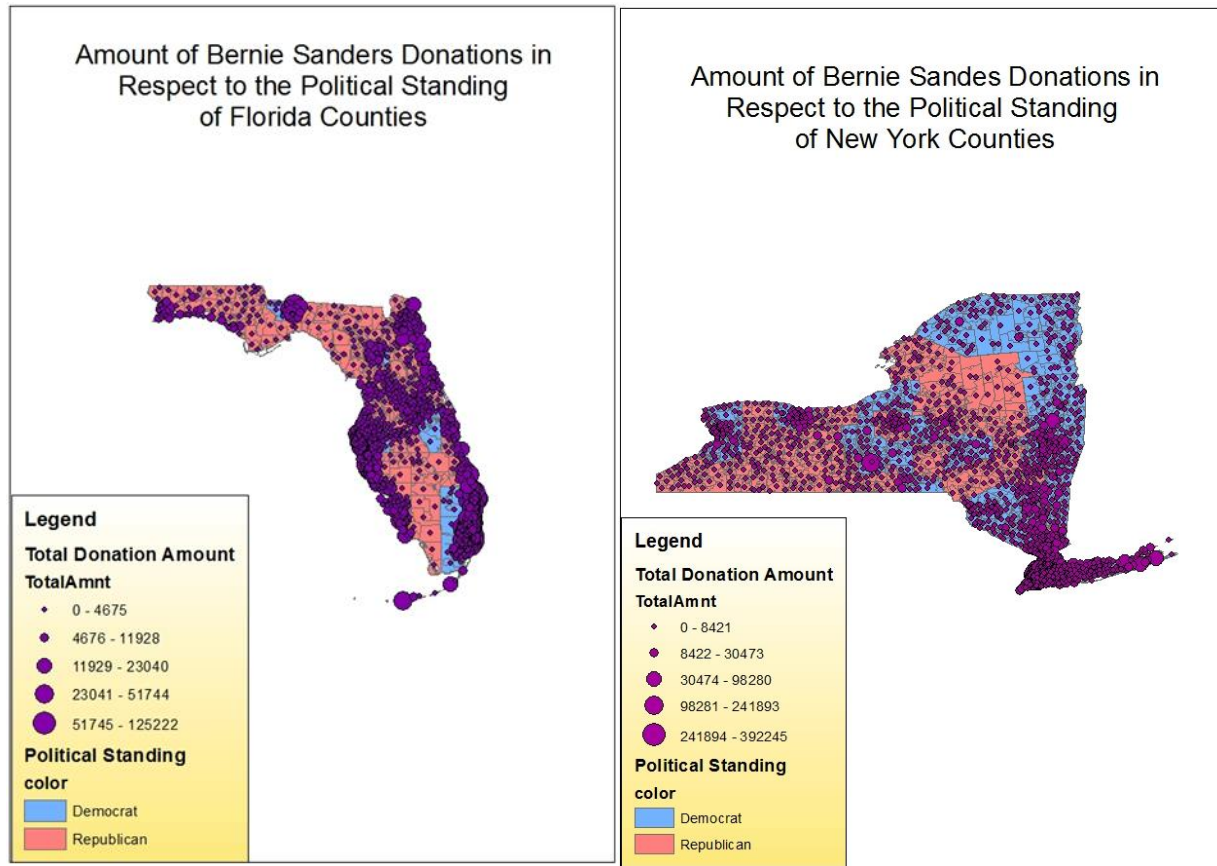**Figure 6.** These maps show the political standing of each county in Florida and New York, according to the 2012 election. Counties that voted for the democratic nominee had a higher donation amount as opposed to the republican counties.
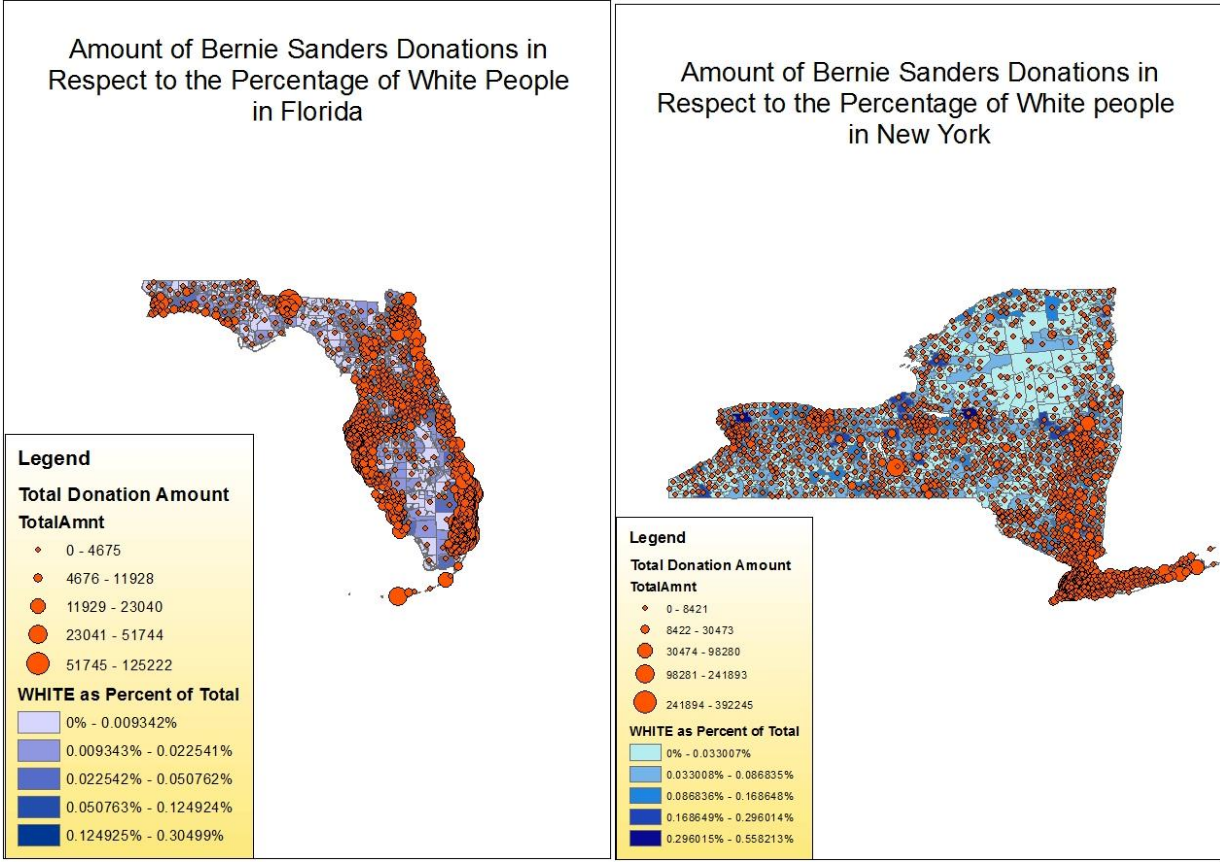
Figure 7. These maps show the correlation between race and Bernie Sanders donations. Those areas with a higher concentration of white people tended to have more donations.
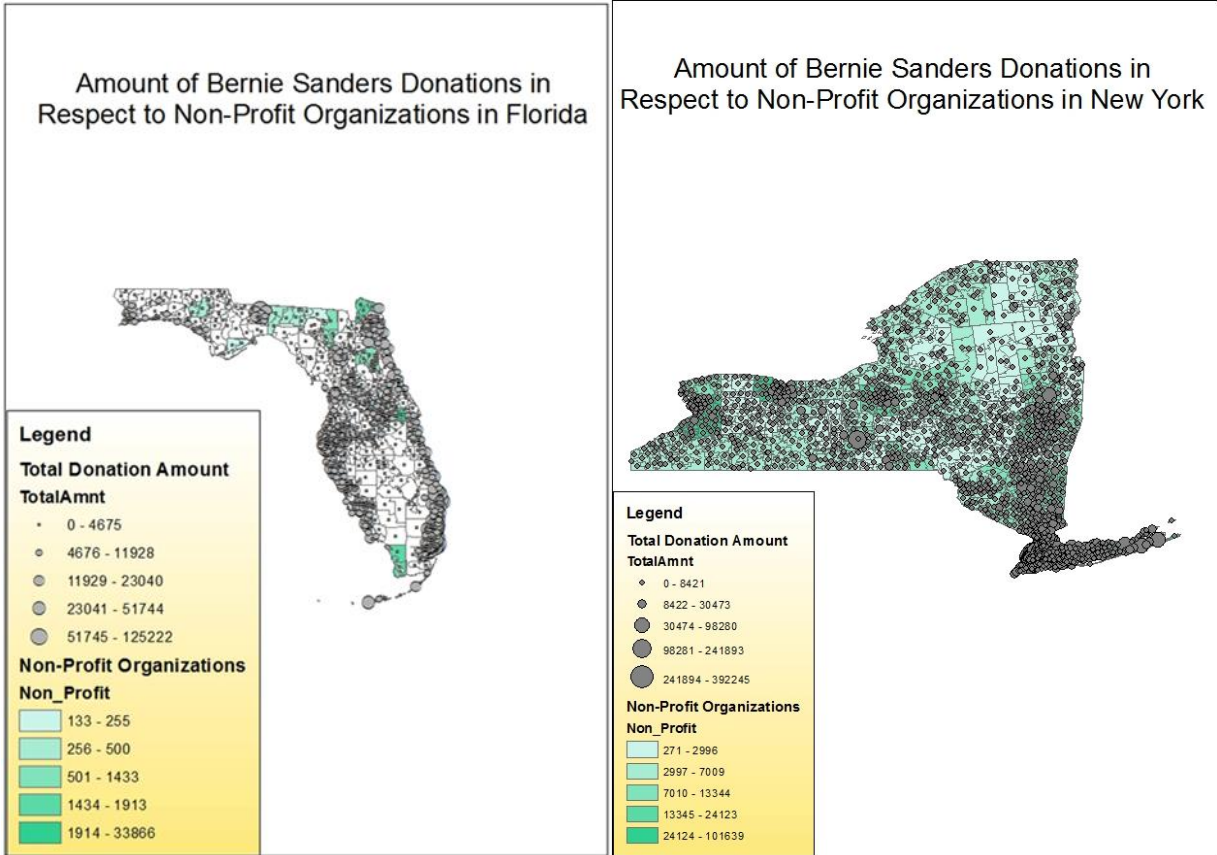
Amount of Bernie Sanders Donations in Respect to Non-Profit Organizations in Florida

Legend
Total Donation Amount
TotalAmnt
- 0 - 4675
- 4676 - 11928
- 11929 - 23040
- 23041 - 51744
- 51745 - 125222

Non-Profit Organizations
Non_Profit
- 133 - 255
- 256 - 500
- 501 - 1433
- 1434 - 1913
- 1914 - 33866

Amount of Bernie Sanders Donations in Respect to Non-Profit Organizations in New York

Legend
Total Donation Amount
TotalAmnt
- 0 - 8421
- 8422 - 30473
- 30474 - 98280
- 98281 - 241893
- 241894 - 392245

Non-Profit Organizations
Non_Profit
- 271 - 2996
- 2997 - 7009
- 7010 - 13344
- 13345 - 24123
- 24124 - 101639

Figure 8. This graph shows the distribution of Bernie Sanders donations related to the areas with non-profit organizations. New York had a high correlation between areas that donated and non-profits, while Florida did not have a strong relationship between the two.
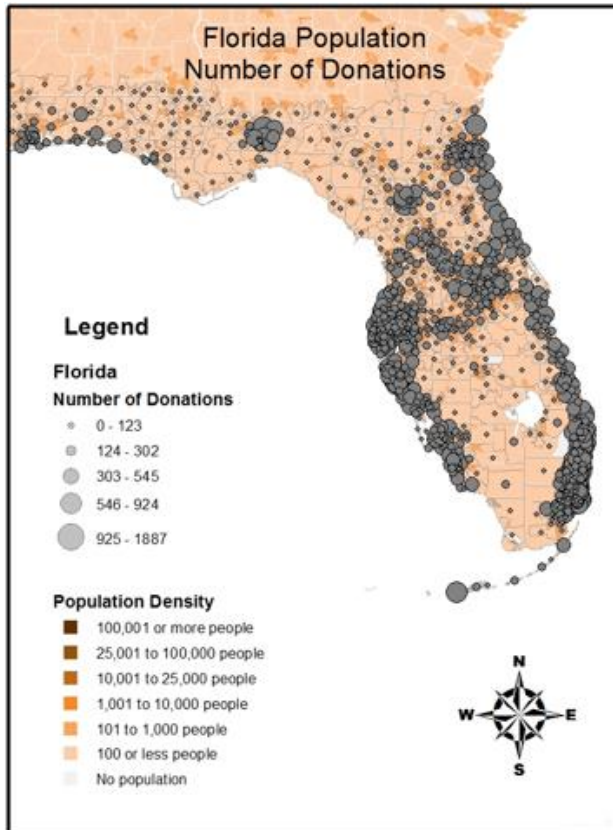
Figure 9. These maps show the number of donations given to the Bernie Sander's campaign overlaid on the population densities of Florida and New York. As expected there is a strong correlation between highly populated areas and those who donated to the campaign. Areas in Florida like Tampa, Orlando, and South Florida have many donors. Likewise, New York City, which contains almost half of the population of New York has an overwhelming number of donors.
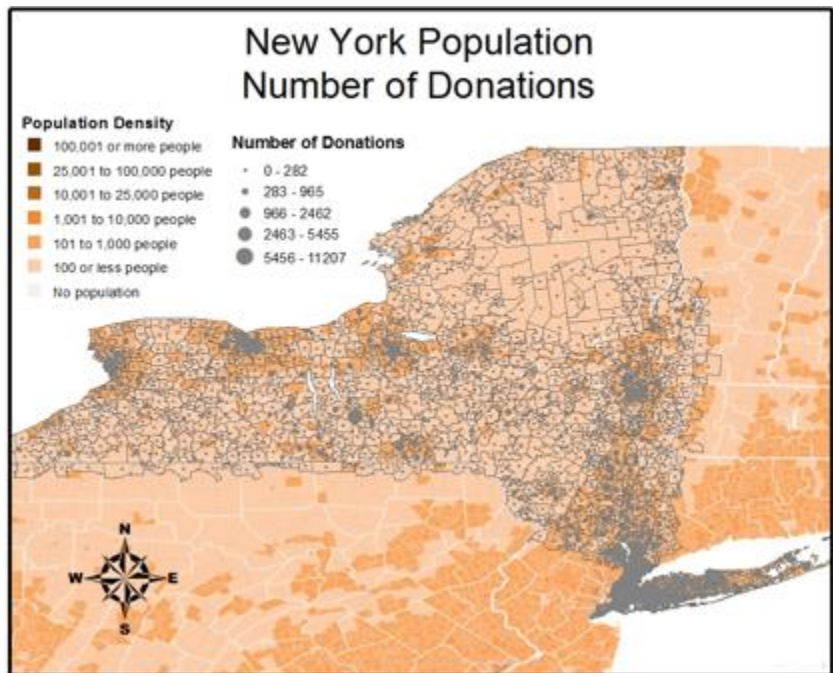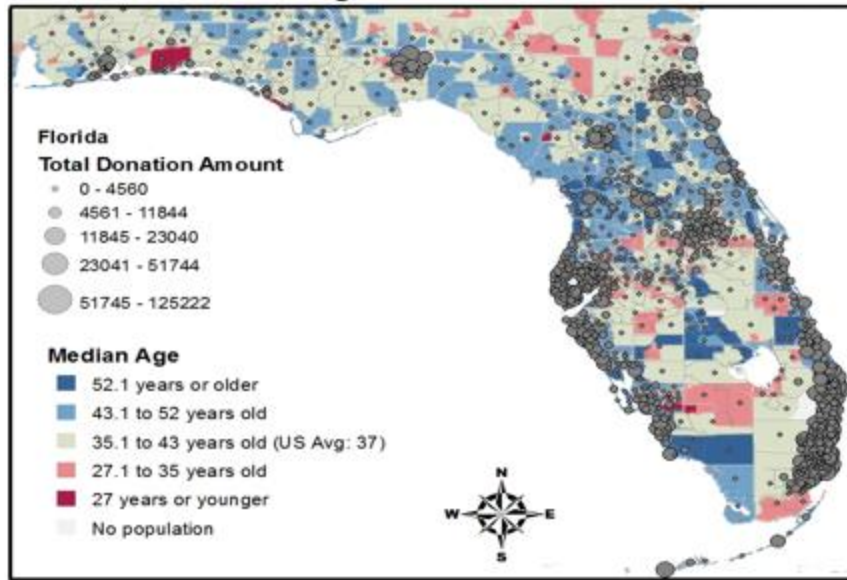
Figure 10. These maps show the median age of New York and Florida overlaid with the total donation amounts for those states. From the maps, we have concluded that younger people tended to donate to the Sanders campaign more than elderly people. This can be seen in by large clusters of donations around uni versity areas in Florida. This can also be seen in New York City; the surrounding areas of New York with older populations have much less donations than the city.

DISCUSSIONS

Race seemed to be one of the biggest indicators determining who donated to Bernie Sanders' campaign. Both Florida and New York showed significant visual correlations between the percentage of white people in the area and the concentration of donations. Areas such as Palm Beach County in Florida and Bronx in New York clearly illustrate the large concentration of whites coupled with the high donation rate. While areas with a smaller percentage of whites still had donations, such as the northeastern corner of New York, they donated considerably less.

Education attainment was also a very significant indicator of the analysis, demonstrating clear positive visual correlations between the amount donated and the level of education in both states. In Florida, donations were highest among the southern east and west coasts, in central parts of the state including Jacksonville, Gainesville, and Orlando, and in parts of the panhandle. These same areas of Florida also tended to exhibit the highest percentages of college education in the state. Most notably, the highest level of education attainment was seen in the southeastern and north central portions of the state. The education maps for Florida display nearly identical patterns between education attainment and Sanders donations. New York also displays a similar trend among donations and education, though not quite as clearly as Florida. The hotspots for college degree attainment in the state include New York City and Long Island, Buffalo, Rochester, Albany, and the Syracuse areas. All of these regions of New York also exhibited significant amounts of donations, but so did many other less-educated areas, including most of the lower half of the state. This slight difference in the pattern between education and donation amount in each date could be due to the political background

of the states; being a Democratic state, New York is still likely to have Sanders supporters even outside of highly educated areas, while Florida, a Republican state, is not as likely to garner Sanders support in the rest of the state where education attainment is not as high.

The historical political standing of each county also seemed to be a successful indicator for predicting who donated to Bernie Sanders. Blue counties such as Gadsden, Palm Beach, Broward, and Miami-Dade in Florida all have a large concentration of donations, whereas the red counties in the panhandle and in central Florida are sparser in terms of donations. This same relationship can be seen for most of New York. New York, however, has some abnormalities. The entire northeastern corner is historically democratic, but they have a lower concentration of donations as opposed to the southwestern corner which is historically republican yet has considerably more donations. This paradox can be explained by other factors. The counties could have changed political ideals between the 2012 election, when this data was collected, and this past year when Bernie Sanders received his donations. People with more liberal beliefs may have moved into these areas during this four year gap.

The presence of non-profit organizations in New York has a noticeable visual correlation with donations contributed to Bernie Sanders. All areas with a high concentration of non-profits also have a high concentration of donations. Ideologically, this makes sense as Bernie Sanders championed many non-profit organizations and their work in his platform. This trend is not seen in the state of Florida. Floridian donations appear scattered away from non-profits, rather than clustered around them. Florida has fewer overall non-profit organizations than New York, which may also contribute to this lack of correlation.

Immigration rate as an indicator did not result in any significant patterns. One of the reasons immigration likely did not produce meaningful results was because outside of New York City and Long Island, the state of New York exhibited hardly any immigration. Thus, this specific region of the state had a positive relationship between donations and number of foreign born persons, but that is the only area of New York that did. Similarly, in Florida, only the southeastern coastal region of the state, from West Palm Beach southward, and slightly so in the Jacksonville area, exhibited any noticeable positive relationship between the two variables.

There was a very strong visual correlation between population and number of donations to the Sanders campaign. This is a relationship that we expected in the data. A good number of donations in New York came from New York City. Since the City contains about 40% of the population of New York, I believe this was a very realistic result. Florida showed the same trend, with most donations coming from densely populated areas like Tampa, Orlando, and South Florida. On the contrary, the data displays a very small number of donations from rural areas in both Florida and New York. This makes sense considering less people means less donations. Population density was an indicator that was predictable and gave a very solid pattern of data.

We felt that age gave us a good indication of the type of people more likely to donate to the Sanders campaign. In both states, there was a noticeable trend that younger people tended to donate more than older people. This was especially noticeable in a place like Gainesville, where there is a very young population surrounded by an older population in the surrounding areas. The young population is due to the university, and there was a large number of donations in Gainesville compared to other areas around it. The same was true for New York,

but not to the same degree as Florida. New York had a surge in donations in areas populated with younger people. However, there were also outliers with some areas with an older population contributing to the campaign as well. We believe this was due to New York traditionally being a strong Democratic state. We feel age is still a very good indicator and young people contributed more than older people.

Crime rate was not the strongest indicator for this study. There appeared to be no strong visual correlation between the crime rate of the state and those who donated to the campaign. The crime rate did seem to increase among bigger cities; however, we feel this is a result of population density, and has no relation to those who contributed to the Bernie Sanders campaign. We were not surprised by this lack of correlation. We did, however, want to confirm our theory about the lack of an apparent relationship among crime rate and campaign donors.

The map that showed average annual income across the states drew fairly predictable results. In locations with large metropolitan areas, average annual income seemed to be highest. This did not come as an abnormal finding, seeing that incomes are usually higher in cities because cost of living is typically higher as well. In order to draw what was originally predicted to bring the most interesting findings, the Sanders donation data was displayed by dividing the total number of donations by the total population per zip code. When studied, the most condensed areas of donations were obviously seen in New York City and Long Island. It was similar for Florida, where areas like Tampa Bay and South Florida show high levels of donations. A moderately strong visual correlation between average annual income and large donation amounts was also seen. However, one of the outliers noticed is in Jacksonville where

most of the "green" suburbs with high annual incomes do not show many donations to the Sanders Campaign. This could be because of many factors that were also studied in this report, one of which could very well be political party.

The map displaying gender majorities strongly showed that there is generally a higher percentage of females among metropolitan areas. In addition, a higher percentage of males are often found in rural areas. When looking at the number of donations per zip code across New York and Florida, we found that cities often had the highest number of donations to the campaign. Although this might come across as obvious, one could conclude that since there are a higher percentage of females in metropolitan areas, then females would be more likely to donate to the campaign. The donation distribution maps also showed important outliers where several zip codes in each state that were primarily rural and in some cases primarily male were found to have a superior number of donations compared to other similar areas. This could be because of the very low population in that area. A small number of individuals have the possibility to significantly affect the overall area. Although they might be outliers, this is important to know for the campaign because these areas could still be worth investing in.

The map showing median home values displayed that, as predicted, areas with high home values are in metropolitan areas. The average donation amount per zip code showed to follow the median home value. As the median home value increased, so did the average donation amount. The average donation amount seemed to be strongly visually correlated with the median home value. There were not any major outliers that were fairly obvious from this map. It would be a safe assumption in using areas of high home values as an area of high potential for donors.

CONCLUSIONS

Average annual income was found to have a direct visual correlation with Sanders donations. In order to cast a different light on the Sanders donation data, the number of donations was divided by the total population. After comparing both data sets, the overall conclusion was that the correlation was strong between the two. In looking at the cartographically intelligent gender map, females were found to have the majority in most metropolitan areas. At the same time, the number of donations was found to have the same similarity. Therefore, a conclusion was drawn that both these data sets have a direct correlation to one another. In Median Home Value results, most high living costs were unsurprisingly found in cities. At the same time, the average donation amount was found to be high in these same areas. These results can be seen as having a relationship with one another.

The historical political standing appeared to have a direct relationship to the amount of Sanders data. Both Florida and New York had significantly higher concentrations of Bernie donations in counties that voted democrat in the 2012 election than those who voted republican. Race also showed to be a significant indicator. Both Florida and New York had high levels of white people where the donations were the most concentrated. The level of education attainment was also revealed to be an important indicator, showing evident positive visual correlations between the amount donated and the level of education in both states. Age and population were both indicators that also gave a strong visual correlation with number of donations. Younger people in populated areas tended to donate to the Sanders campaign. Crime rate and immigration rate, however, proved to have very little association with campaign

donors. There weren't any clear patterns to allow us to draw significant conclusions from the

crime and immigration data.