11.205 – Intro to Spatial Analysis – Fall 2019

Problem Set 1 – Using Data to Argue for a Policy
Due: Before midnight, Thursday of week 4

In lab this week, we downloaded U.S. Census data from an online data source and joined it to geographic files in order to map it. This included:

1. Acquiring ACS data from Social Explorer.
2. Using Excel with GIS.
3. Making maps with downloaded data.
4. Making charts from GIS data.

The Bronx is not only a borough of New York City, but also administratively it is also its own county. In fact, Bronx County is considered the most diverse county in the country. As of the 2010 Census, there is an 89.7% chance that any two residents, chosen at random, would be of different race or ethnicity[1]. The Bronx River Alliance is building a case for multi-lingual signage along the Greenway to help address the needs of what the organization believes has a large nearby Hispanic population. They would like you to create a document presenting their argument for multi-lingual signage using maps, graphics, and analysis.

They have datasets for block groups and tracts that match the 2011-2015 American Community Survey[1] data, along with water, parks, and boundary layers that you will need for your map (we have put these in the data folder for the problem set). They have not downloaded the census variables for Bronx County that are needed for the analysis, however, and you will need to do this to complete the task. The Alliance know this data exists in the ACS and thinks it would be easiest to use Social Explorer to find the variables.

The Bronx River Alliance would like a memo that contains, at the very least, the following three maps and chart:

1. A **map of the Bronx** showing the **percentage of people in the Bronx who are of Hispanic or Latino origin** by **census block group** using the **2011-2015 American Community Survey 5-Year Estimates**. Please add the boundaries of the Bronx River Watershed. Include an analysis/interpretation of the results. (*Hint: The Bronx River Alliance remembers that they saw a variable called "Hispanic or Latino by Race" on Social Explorer and thought you would be able to use that. Note that the table includes all individuals of Hispanic or Latino origin.*)

2. A **map** of the **Bronx River Watershed** showing the **percentage of Spanish speakers (in the population of people 5 years and over)** by **census tract.** This is also available in the **2011-2015 American Community Survey 5-Year Estimates** in the 'Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over' table. They would like you to include only the census tracts that

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[1] The analysis here is based on the 2011-2015 ACS survey estimates instead of the 2012-2016 estimates, because the latter does not currently include information on the language spoken at home by ability to speak English, which is required for the analysis.

intersect the Bronx River Watershed. Include an analysis/interpretation of your results. *(Hint: Perhaps search all datasets for the keyword 'Language')*

3. The **2011-2015 ACS 5-Year Estimates** on Language Spoken at Home also contain information on individuals who speak English 'Less than "Very Well"'. The Bronx River Alliance would also like **a map** showing the **percentage of Spanish speakers who speak English less than very well (in the Spanish speaking population)** in the **census tracts** that **intersect the Bronx River Watershed.** On the map, please highlight the ten census tracts with the highest actual population number of Spanish speakers who speak English less than very well. Include an analysis/interpretation of your results. *(Hint: "Language Spoken At Home By Ability To Speak English For The Population 5 Years And Over" will be helpful for answering this question as well.)*

4. Signage along the Bronx River Greenway can hold up to four language variations. The same 'language spoken at home' variable has information on other languages, such as French, Italian, German, Yiddish, etc. They would like to see which other languages are spoken. Make **a chart/graph** that shows **the total of people by the language/ language group they speak at home** for the **census tracts** that **intersect the Bronx River Watershed**. Please show the top six languages or language groups spoken, including Spanish, and lump all the other languages into a seventh category called 'Other'. Put both the percentage and total number on your charts. Include an analysis/interpretation of your results. *(Hint: "Language Spoken At Home By Ability To Speak English For The Population 5 Years And Over" will be helpful for answering this question. Please use the given categories of languages/ language groups from the original dataset—i.e. You do not need to regroup or re-interpret what is considered a 'language' or a 'language group'.)*

Summary of deliverables
A succinct and effective memo that includes:
1. Map of the whole Bronx showing the percent of Hispanic/Latino population.
2. Map of the watershed showing the percent of Spanish speakers.
3. Map of the watershed showing the percent of Spanish speakers who speak English 'less than very well' in relation to the total number of Spanish speakers, with the ten highest by number highlighted.
4. A chart showing the top six languages spoken in the watershed.

Hints and Tips
All necessary data is available through the American Community Survey and can be found on Social Explorer. Use the keyword tool to locate the proper tabular datasets. Use 2011-2015 year estimates. Social Explorer has a keyword search to help you identify the variables you need. You can find the Keyword Search once you have specified the geography you are interested in.

The data you are using will be either at the Block Group or Census Tract level, this is noted in each of the maps above and chart requirements. For Census Tracts level tables, make sure you are using the State -> County -> Census Tract level **called 140**, and for Census Block Group level tables, make sure you are using State -> County -> Census Tract -> Block Group **called 150**.

The document you provide the Bronx River Alliance is meant to be an argument, so it needs to stand up against scrutiny. Cite all your sources and be specific about the dataset and population you are using. Map sources should be cited on all maps.

While you may assume the Bronx River Alliance has a bias towards the issue, they are more interested in making a sound argument. Make only arguments you can back with your data.

Think about your classification methods and remember the practices we have learned so far in class.

Combine your maps and graphics into a single document (Microsoft Word, InDesign, etc.) and save it as a PDF. Post a copy of the PDF to Stellar.

Remember the basic map elements and include them on each map. Points will deducted for missing elements.

[1] http://en.wikipedia.org/wiki/Demographics_of_the_Bronx

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