

Broadband & Internet Access Deserts

CS506 Spark Project, Census Team 2

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Introduction

This project was assigned by Elsie Nolan from WBZ-TV (CBS Boston). This goal was to identify areas in Massachusetts where people had low rates of access to the internet using 2020 census data. These areas are what we refer to as ‘Broadband deserts’. After identifying broadband deserts, our goal was to identify the demographic composition of those areas. We created interactive maps to easily find areas with low internet and broadband accessibility. We created tables to display the demographic setup of the areas within each county where the largest amount of people had no internet access. Finally, we created graphs to display trends between racial and income features in relation to internet access rate and broadband subscription rate.

Data

For this project we utilized the census data api provided through the ‘census.gov’ website: (<https://www.census.gov/data/developers.html>). We were meant to use the brand new 2020 census data for our project however, it was not released in time of the making of this report. We therefore had to use the American Community Survey (ACS) 2015-2019 aggregated dataset. We did not use the ACS 2019 data because it is only available at county level rather than the much smaller census block group level.

Methods

To gather our census data, we used “censusdata” in python and “tidycensus” in R. The census data API requires special codes for the census information to pull down which can be found here <https://api.census.gov/data/2019/acs/acs5/variables.html>. We used this table to gather the codes for the various internet and demographic variables that we were interested in. We also manually pulled down some additional demographic and geographic information from censusreporter.org and huduser.gov.

We used a combination of Python and R to create the maps, graphs and tables that are included in this report. The tables that illustrate demographic information for various counties in Massachusetts were created using Python. HTML maps were created using R and Python. We used R to create our maps and graphs because when calling the data in R the geometry of the

block group boundaries (similar to longitude and latitude) is automatically pulled down while in Python it is not; generally, it appears that the Census packages are more developed in R than they are in Python. To download the applicable data, a Census API key must be generated: https://api.census.gov/data/key_signup.html. Save the key in “api.key” in the current working directory. A U.S. Department of Housing and Urban Development key must also be generated; sign up for on here: <https://www.huduser.gov/hudapi/public/register?comingfrom=1>. The latest version of the code and maps are all located in the following github repository: https://github.com/BU-Spark/ds-cbs-boston/tree/censusteam2_deliverable4_R/census-analysis-team-2. For the code see: https://github.com/BU-Spark/ds-cbs-boston/tree/censusteam2_deliverable4_R/census-analysis-team-2/deliverable4. See “README.md” for additional information on how to view the maps and run the code.

Results

One of the main questions we were trying to answer was are there broadband deserts in Greater Boston? If so, where are these broadband deserts located? We consider a broadband desert to be an area where at least 20% of a block group does not have broadband subscriptions. In our data, we observed that most block groups and census tracts around Boston actually did have 80-90% broadband subscriptions, yet there were still some areas with low percentages for having a broadband subscription. To get a sense of which communities these broadband deserts were located in, we created the following two maps of the city of Boston. They display areas that can potentially be defined as broadband deserts. The first map shows all the block groups where more than 25% of people have no internet access. The second map shows all the areas where less than 30% of people have access to broadband. The two maps are fairly similar; by definition, everyone without internet access will also lack broadband internet. In the maps below, we identified that certain areas around Jamaica Plain and Roxbury appear to be broadband deserts and lack internet access. The maps are meant to be used in combination with the interactive maps (further explained below) to make it easier to find the broadband deserts on the interactive maps.

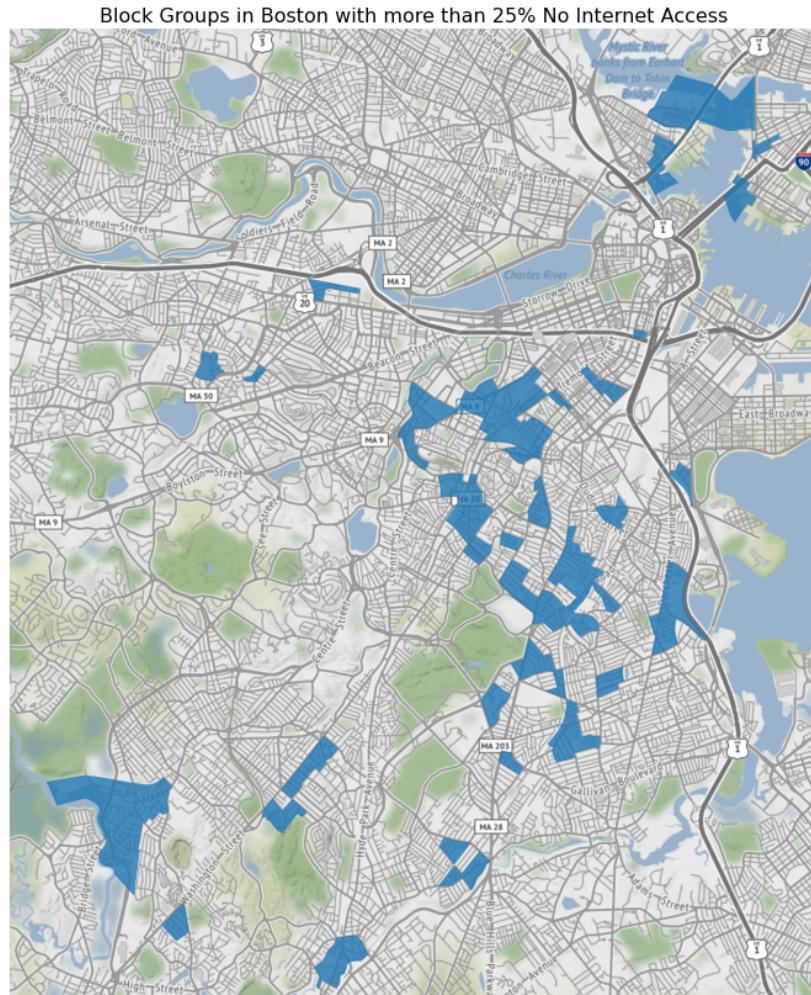


Figure 1: Areas in Boston With No Access to Internet (>25%) by Block Group

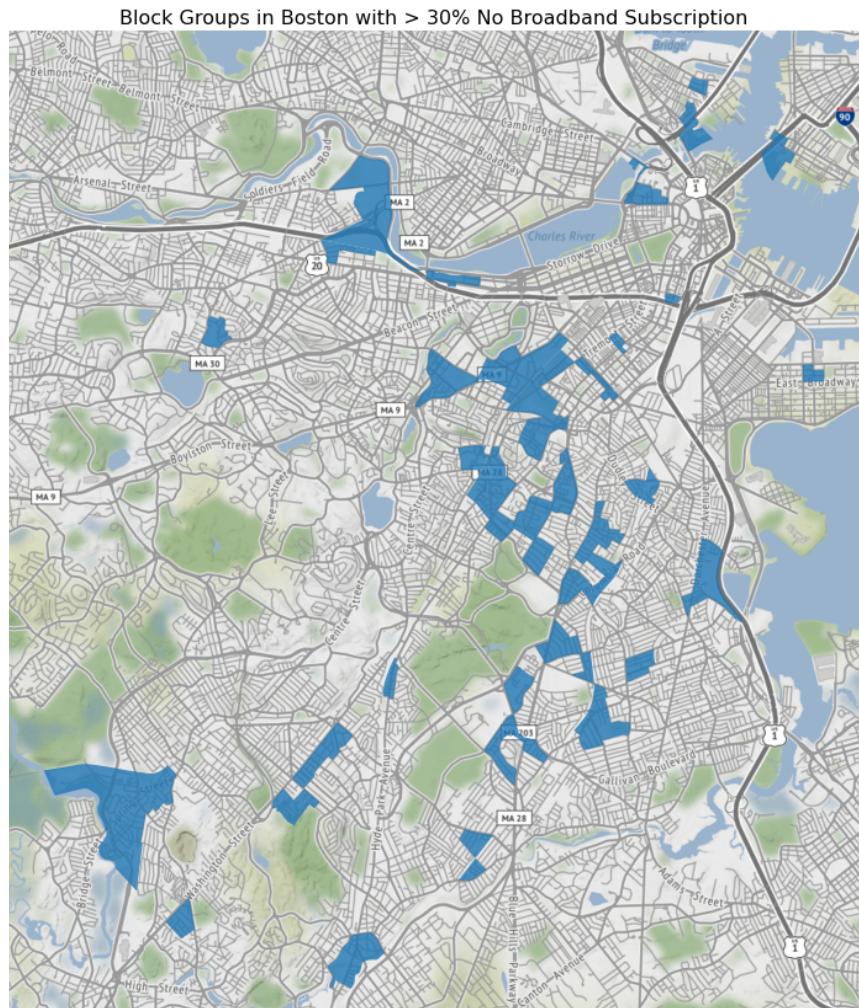


Figure 2: Broadband Deserts in Boston (>30% No Broadband Subscription)

Interactive Maps

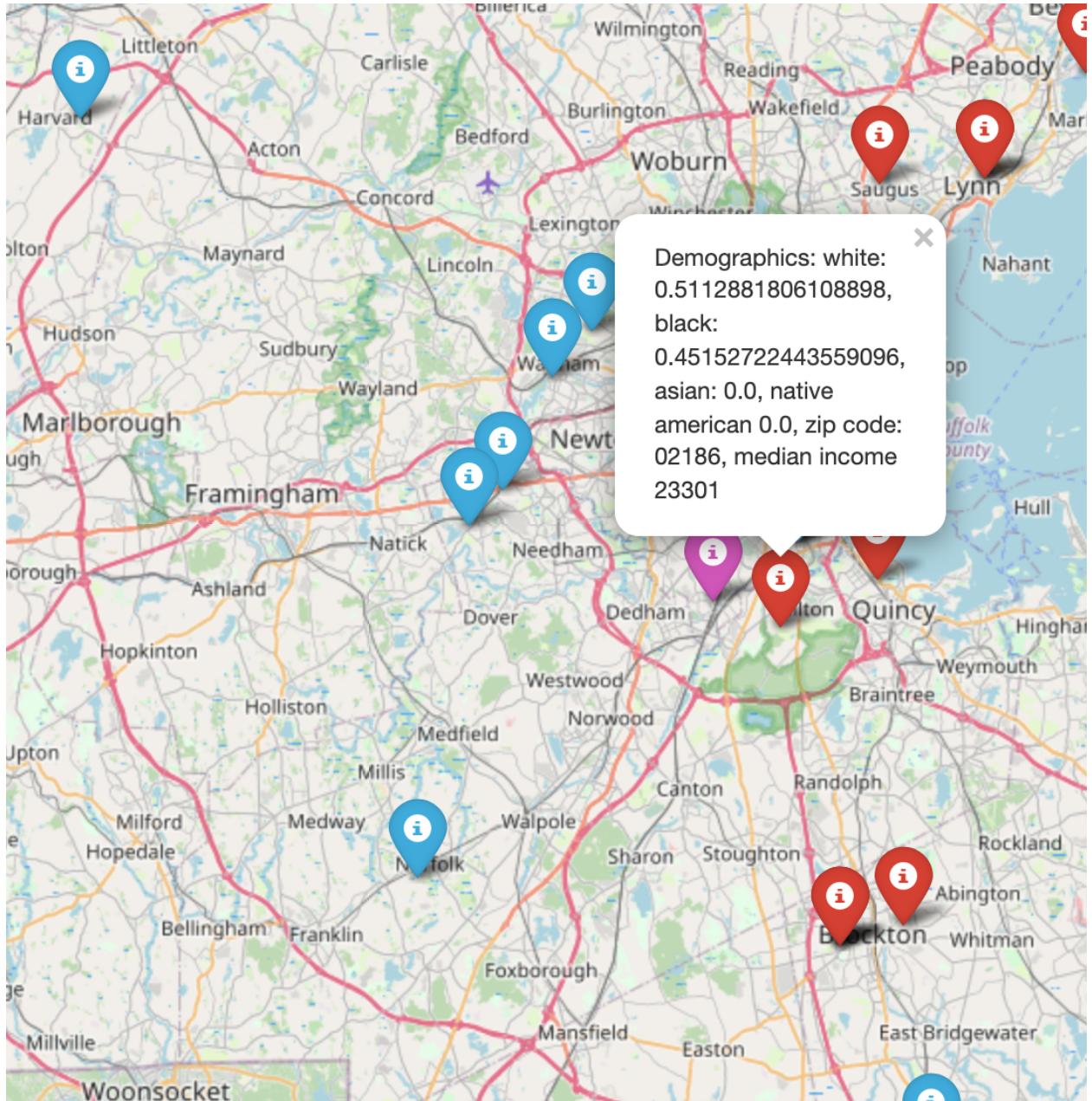


Figure 3.1: Here we click on a red icon, the red icons represent block groups for which more than 20% of the population do not have internet access. Upon clicking on it, we get the demographic breakdown by percentages, the median income of the area, and its zip code.

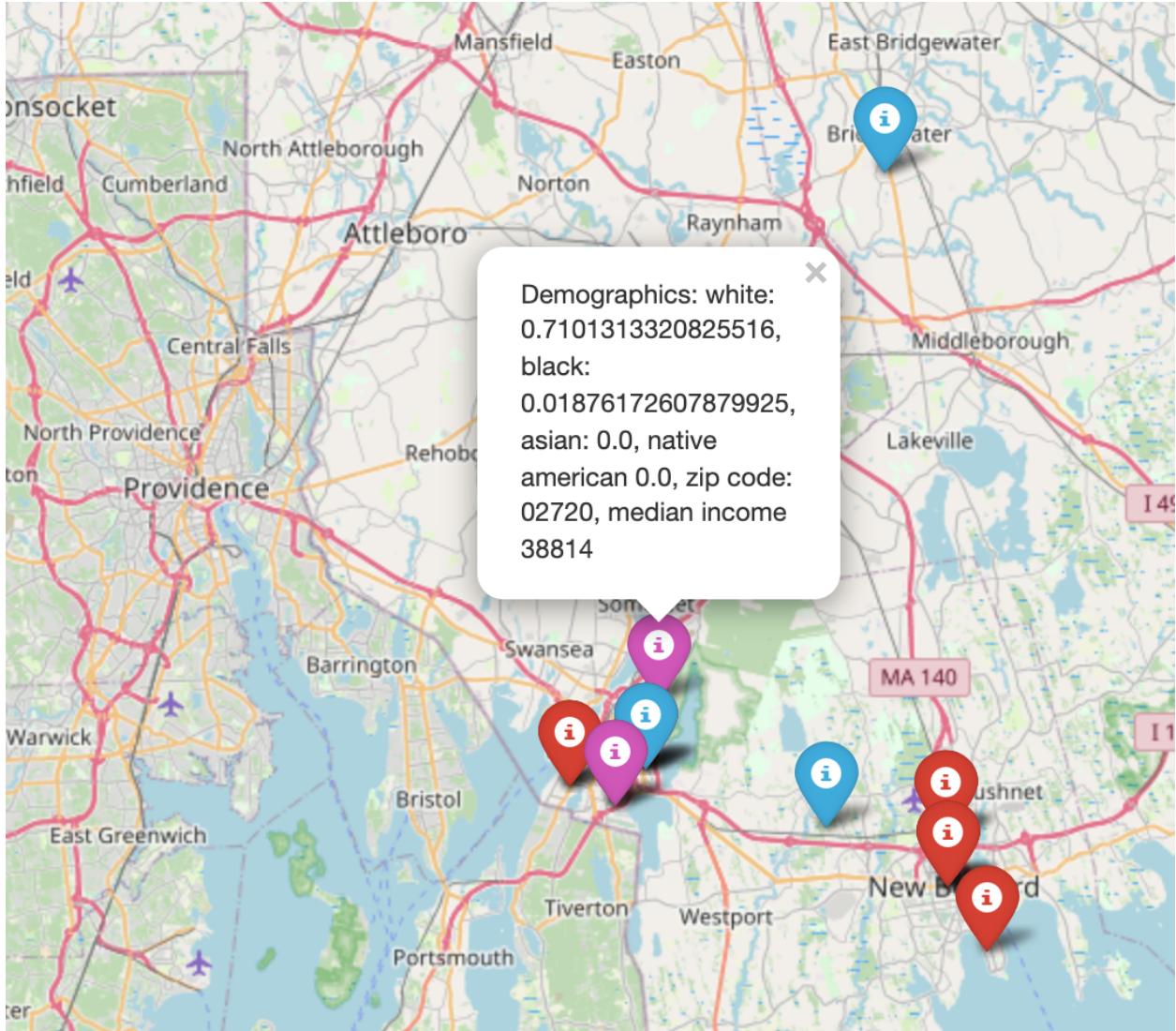


Figure 3.2: Here we click on a purple icon, the purple icons represent block groups for which more than 20% of the population do not have internet access and less than 20% have a broadband subscription. Upon clicking on it, we get the demographic breakdown by percentages, the median income of the area, and its zip code.

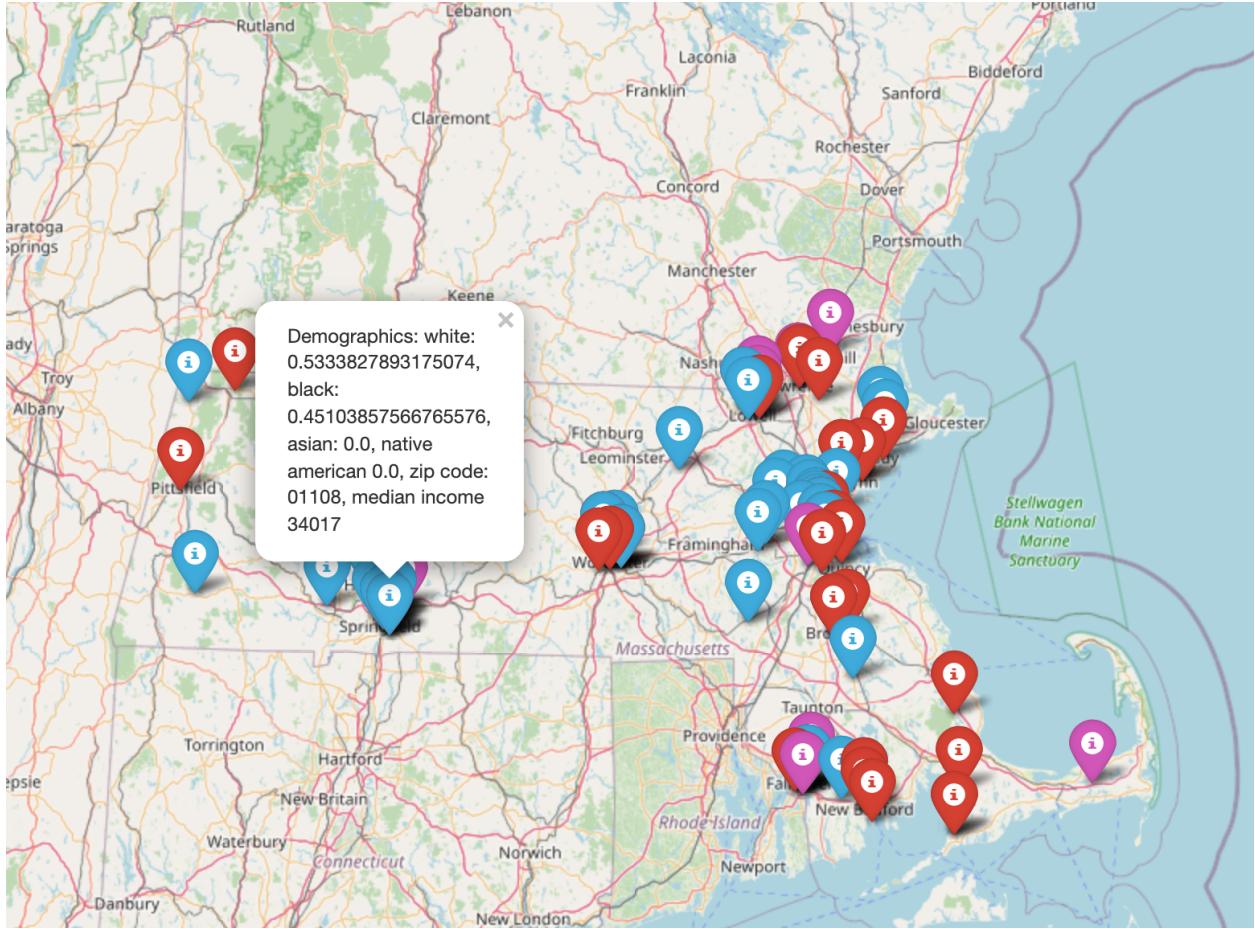


Figure 3.3: Here we click on a blue icon, the blue icons represent for which less than 20% have a broadband subscription. Since this excludes the intersection of the purple icons, we are left with those block groups for which less than or equal to 10% have broadband subscriptions. Upon clicking on it, we get the demographic breakdown by percentages, the median income of the area, and its zip code.

Interactive Popup Maps: We created a file named `interactive_map.html`, that drops popup icons that are clickable, and give you information about the demographic composition of the block group, the zip code it is located within, and the median income. The icons are color coded. Red denotes all the block groups for which more than 20% of the population do not have internet access. Blue denotes areas for which less than 20% of the population do not have broadband access. The purple icons represent the intersection of those two groups. See Figure 3 for previews, or download:

https://github.com/BU-Spark/ds-cbs-boston/blob/censusteam2_deliverable4_R/census-analysis-team-2/deliverable4/Interactive_map.html.

We created three files called: '`broadband_CableFiberOpticDSL_map.html`', '`broadband_subscript_map.html`' and '`nointernet_map.html`', which all include interactive maps divided into census block groups which make it easier to identify areas where the access to internet is low. The three variables that we focused on are the percent of people without internet access, percent of people with broadband subscriptions and the percent of people with

cable/fiberOptic/DSL subscriptions. It is important to note that the percentage of people who have cable/fiberOptic/DSL subscriptions are a subset of the percentage of people with broadband subscriptions. *Broadband_CableFiberOpticDSL_map* displays the percentage of people within the given block group that have either Cable, Fiber optic or DSL broadband in their homes. *Broadband_subscript_map.html* displays the percentage of people within the given block group that have any kind of broadband subscription. Finally, *nointernet_map.html* displays the percentage of people within the given block group who do not have access to the internet at all. See figure 4, 5 and 6 for previews of these interactive maps. For the full version, download: https://github.com/BU-Spark/ds-cbs-boston/blob/censusteam2_deliverable4_R/census-analysis-team-2/deliverable4/broadband_CableFiberOpticDSL_map.html, https://github.com/BU-Spark/ds-cbs-boston/blob/censusteam2_deliverable4_R/census-analysis-team-2/deliverable4/broadband_subscript_map.html, https://github.com/BU-Spark/ds-cbs-boston/blob/censusteam2_deliverable4_R/census-analysis-team-2/deliverable4/nointernet_map.html. If you would like to see the total population size of each block group, see: https://github.com/BU-Spark/ds-cbs-boston/blob/censusteam2_deliverable4_R/census-analysis-team-2/deliverable4/total_popmap.html.

The three pairs of figures below illustrate a Massachusetts-level graph and a Greater Boston area map for the three variables. All the maps are zoomable and it is possible to toggle between different map options (such as street view) to display underneath the heatmap. It is therefore possible to identify exactly where in the state the given block group with low internet access is located as city and street names are both displayed.

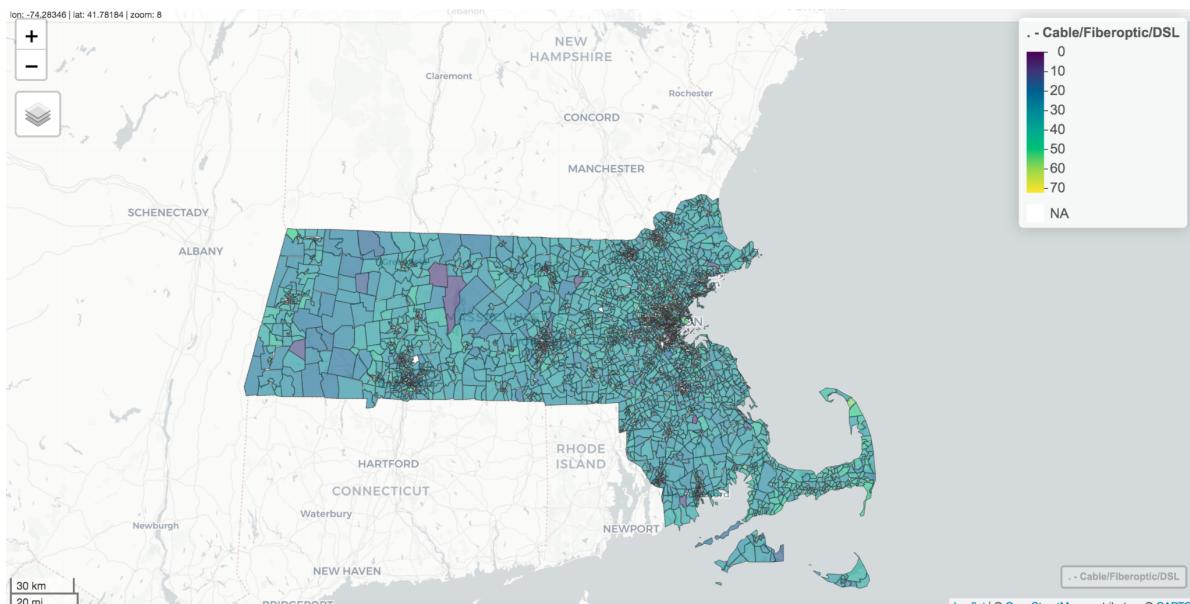


Figure 4.1: Percentage of People with Cable/FiberOptic/DSL

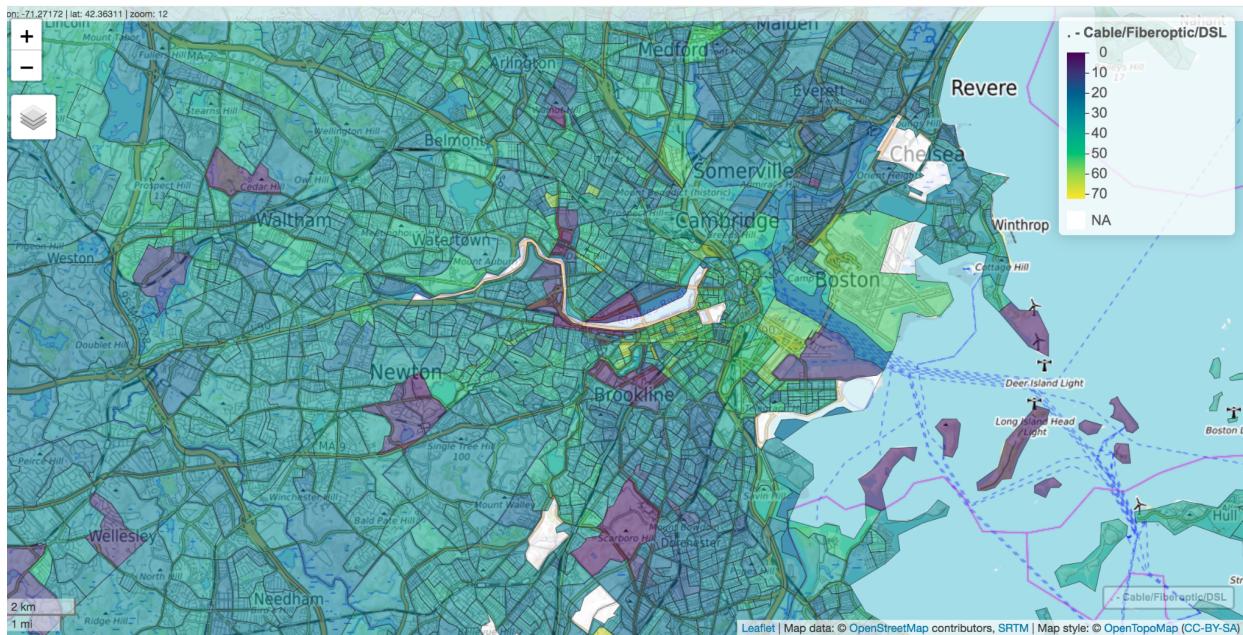


Figure 4.2: Percentage of People with Cable/FiberOptic/DSL (OpenTopoMap)

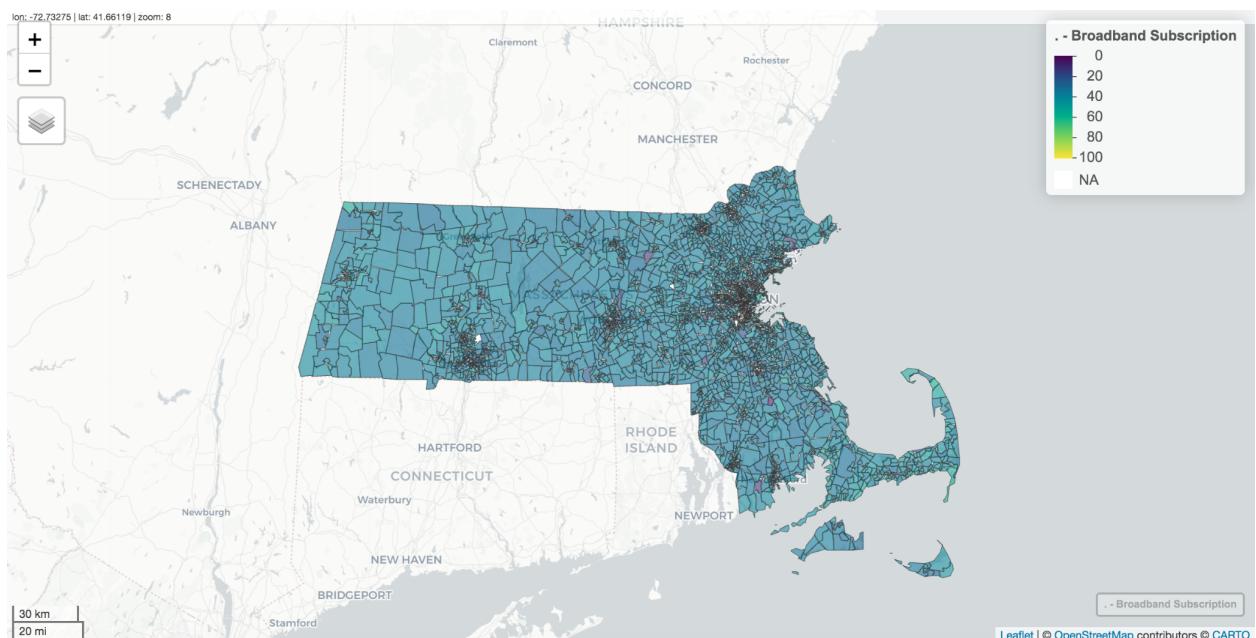


Figure 5.1: Percentage of People with Broadband Subscriptions



Figure 5.2: Percentage of People with Broadband Subscriptions Around Greater Boston

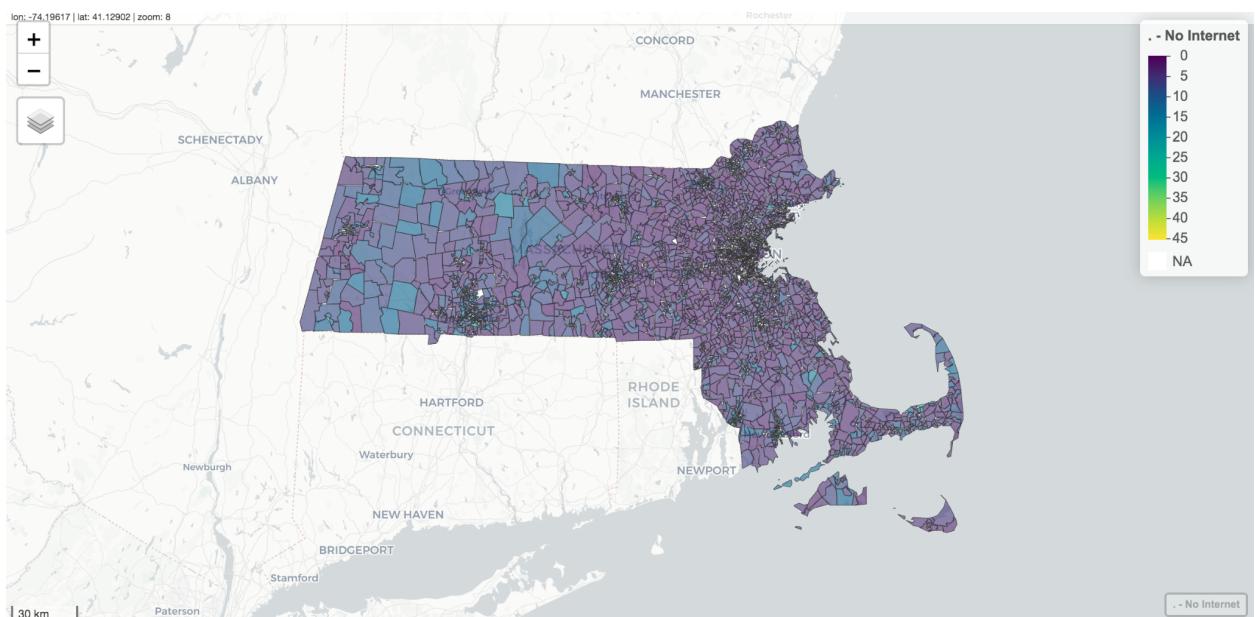


Figure 6.1: Percentage of People with No Internet Access

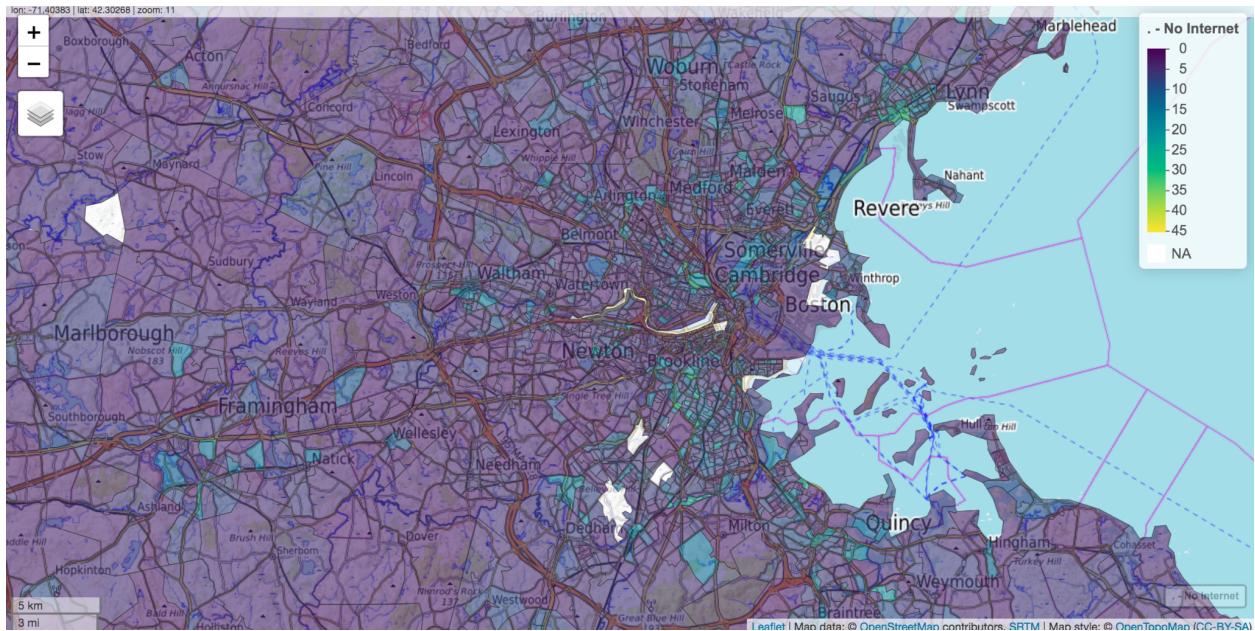


Figure 6.2: Percentage of People with No Internet in Greater Boston (OpenTopoMap)



Figure 6.3: Percentage of People with No Internet in Brookline / South End, Roxbury (OpenTopoMap)

Racial breakdown of block groups, as compared with percent without internet access:

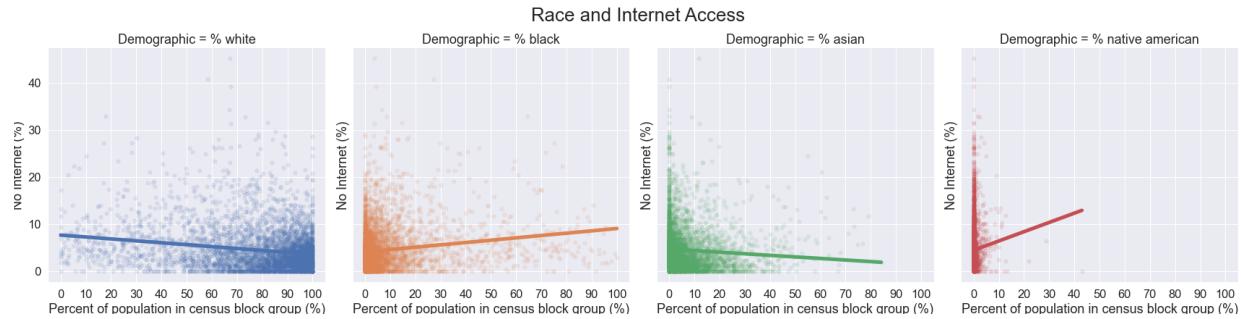


Figure 7: Racial Breakdown of Block Groups Versus Percent No Internet Access

In addition to the HTML maps above, we were curious about what the relationship between race and internet access was for different block groups in Massachusetts. The graphs above illustrate the percentage of the population in a block group for a specific race (White, Black, Asian, and Native American respectively)¹ in relation to the percentage of no internet access.

We observed that generally that with a larger percentage of White people within a census block, the lower the percentage of people with no internet access. We see a similar trend for Asian people however the slope of this line is not as steep, suggesting that this relationship is not as drastic. We also see that generally the more Black people live in a census block, the higher the amount of people with no internet access is. We see the same trend with Native Americans but much stronger. It is important to note, however, that there are no neighborhoods that are majority Native American.

Racial breakdown of block groups, as compared with percent with a broadband subscription:

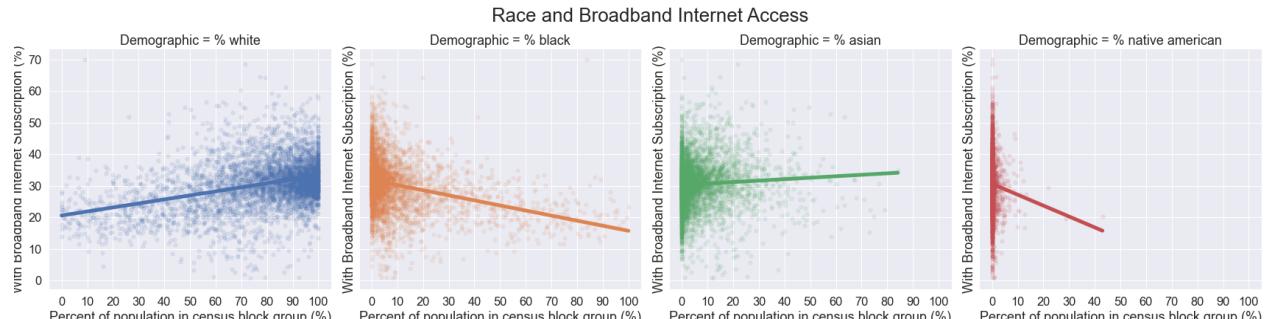


Figure 8: Racial Breakdown of Block Groups Versus Percent Broadband Subscriptions

¹ "Hispanic" is not defined as a (distinct) race in the Census data we worked with and was therefore not isolated and analyzed.

We also created graphs that illustrate the relationship between racial breakdown in block groups versus the percent of people with broadband subscriptions. Similar to the graph above, we see that generally the more White people there are in a census block, the higher the percentage of people with broadband subscriptions there are. We see the same trend for Asian people but less apparent. We again see that generally, the more Black people there are in a census block, the lower the amount of people with broadband is. We see the same trend for Native Americans but there are no neighborhoods where they make up the majority.

Income and internet access:

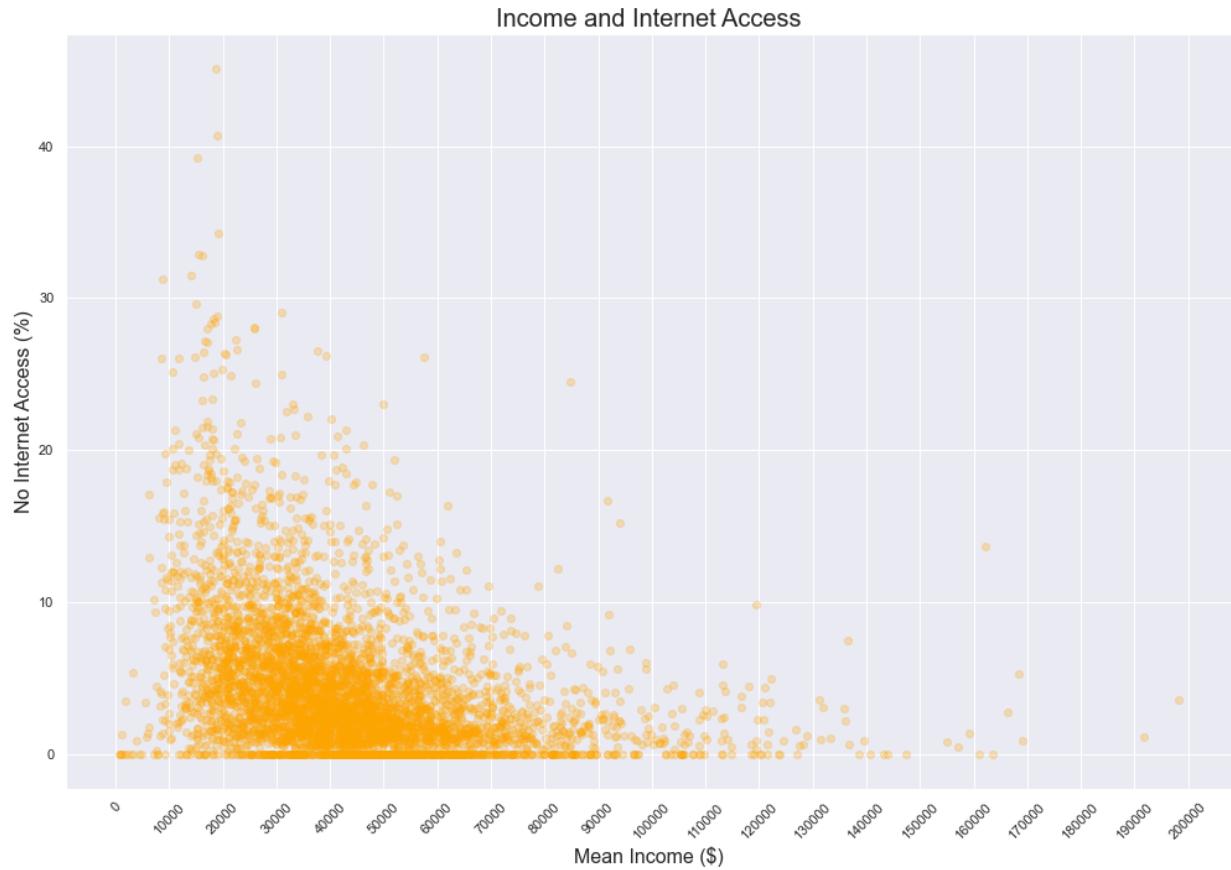


Figure 9: Mean Income vs Percent of People With No Internet Access

We also plotted the relationship between mean income versus the percentage of people with no internet access per block group. We expected that as mean income increases, more people would have internet access. We observed that generally when there is a higher mean income within a block group, there is a smaller percentage of people without internet access.

Income and broadband internet subscriptions:

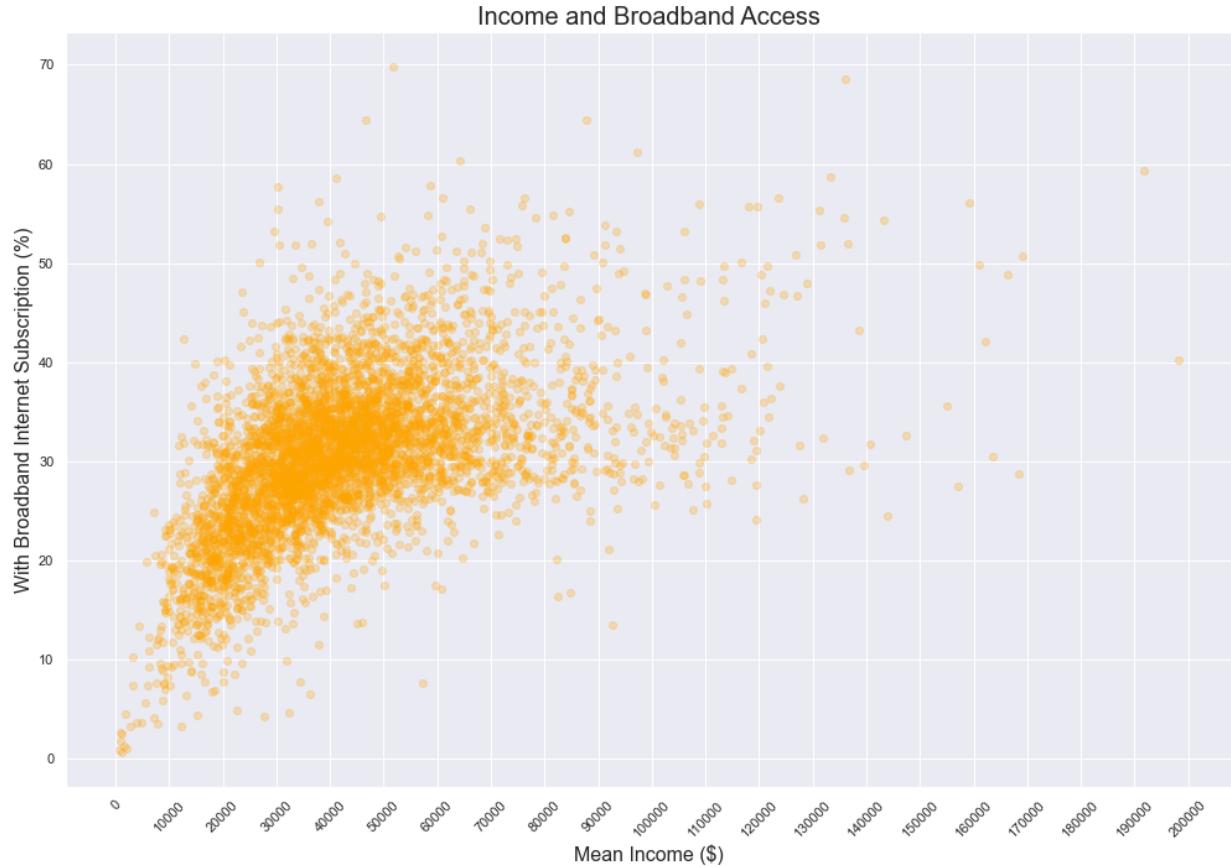


Figure 10: Mean Income vs Percent of People With Broadband Subscription

Lastly, we plotted the relationship between mean income and the percent of people with a broadband subscription per block group. We observed a strong upwards slope between increasing income and the percentage of people with a broadband subscription. This suggests that with a higher income people are more likely to have a broadband subscription in their homes.

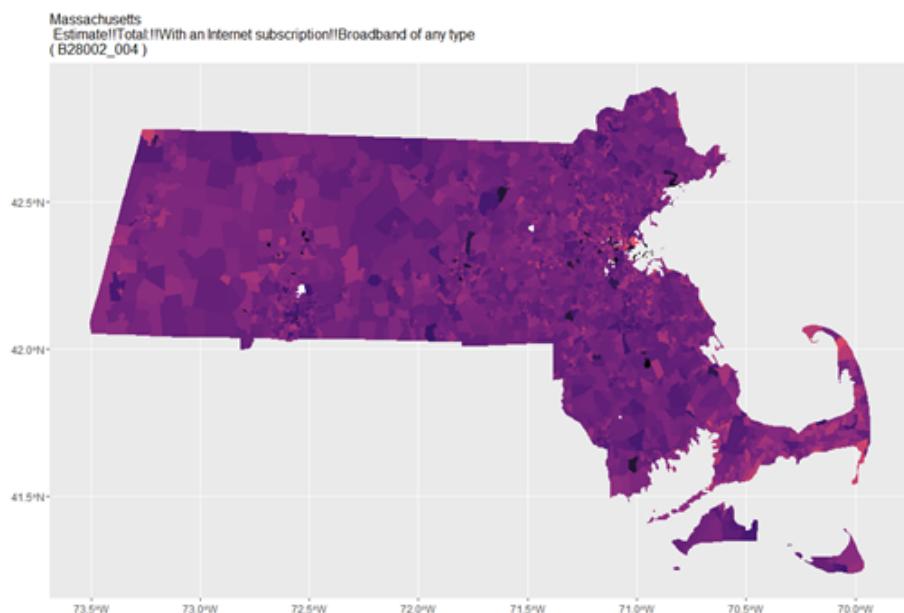
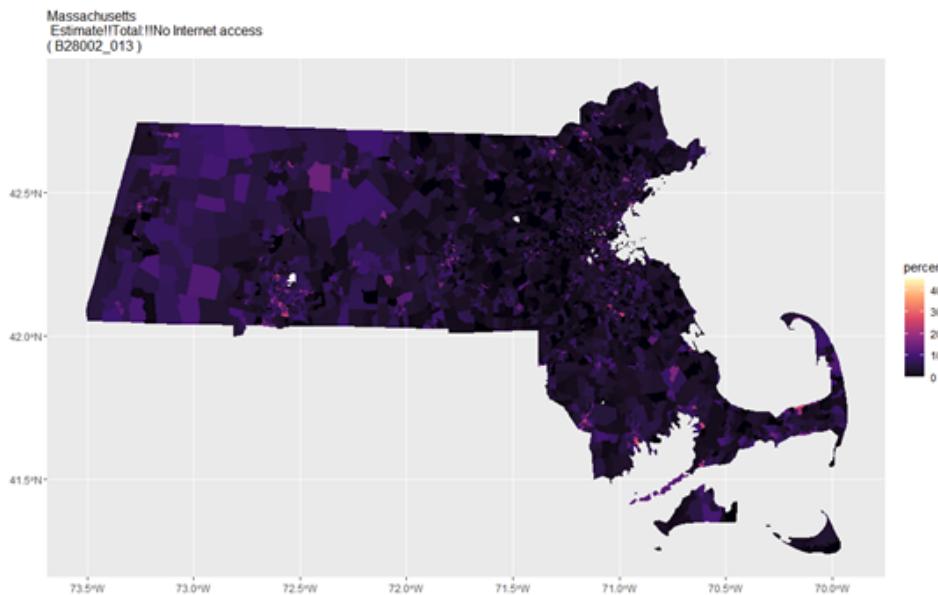
Conclusion

We found that there indeed are broadband deserts in Massachusetts. We found that the mean income in these areas generally were lower than the rest of the state while areas with high rates of broadband access generally had higher mean incomes. We also saw that there are discrepancies in broadband internet access in different racial groups. Areas with higher populations of white individuals generally had higher rates of broadband access and lower rates of people with no access to the internet at all. We saw a similar trend for asian people however, the relation was less strong than for white people. Similarly, we observed the general trend that the higher the amount of black people within a block group the larger the percentage of people

with no internet access was and the smaller the amount of people with broadband subscriptions there were. The trend was the same for Native American people, however there were no block groups where the majority of the population was Native American. Generally, the higher the income and the whiter the neighborhood, the greater the internet access within a block group.

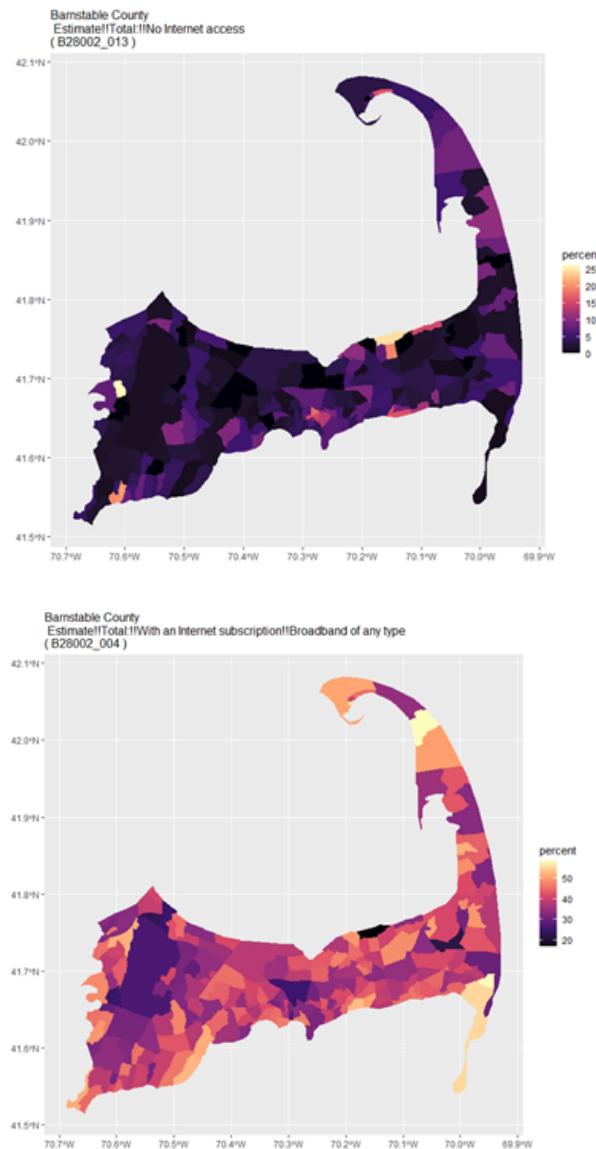
Supplementary Figures and Tables:

Massachusetts (1: percentage of people with no internet | 2: percentage of people with a broadband subscription)



All the following plots are of the Massachusetts counties with the same variables as the plots above. The first figure depicts “percentage of people with no internet” and the second figure highlights “percentage of people with a broadband subscription.” Below the images are tables that contain census tracts in each county that are sorted by the census tracts that contain the highest percentage of no internet access. These tables also include columns describing the demographic composition of areas within the census tract. To make the results more interpretable, we also included a column with the zip code that each census tract corresponds to.

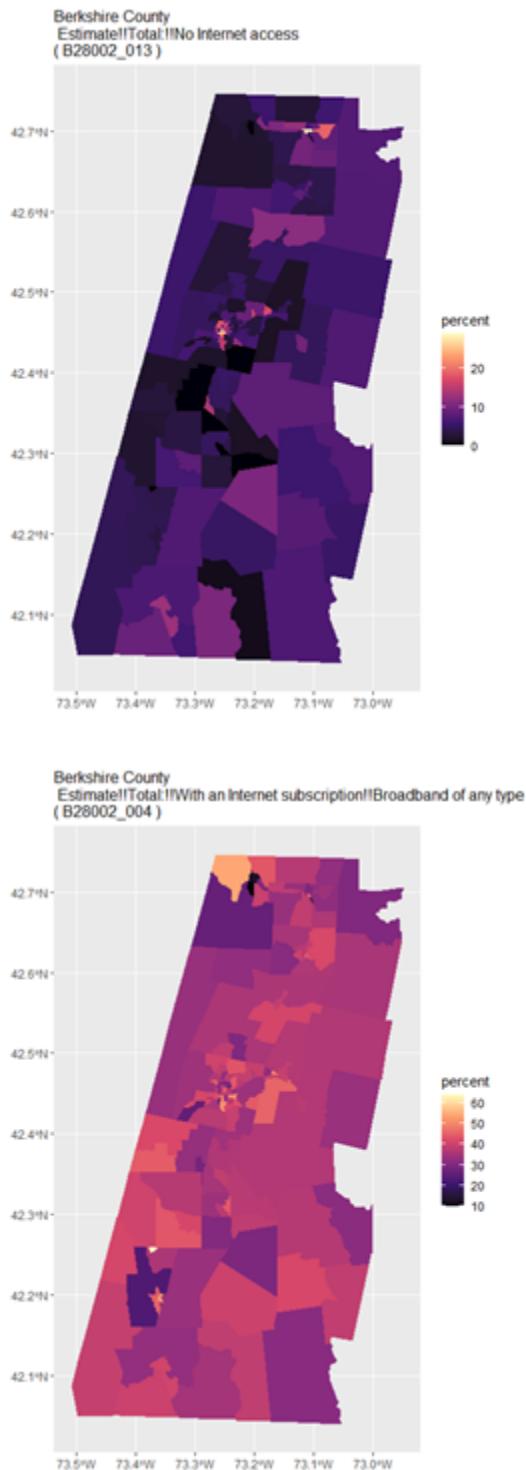
Barnstable County:



Barnstable County Demographics and Internet Information

zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income	
3	02559	140.02	Block Group 3	26.227390	33.462532	100.0	0.0	0.0	0.0	39367.0
3	02660	114	Block Group 3	24.516129	16.774194	100.0	0.0	0.0	0.0	84682.0
3	02540	148	Block Group 3	21.005677	24.412003	93.1	1.3	1.0	0.8	33508.0
1	02540	148	Block Group 1	20.345253	31.196054	83.4	0.7	3.1	8.9	46214.0
3	02540	149	Block Group 3	19.724771	34.097859	85.3	7.8	2.3	0.0	40674.0
1	02660	114	Block Group 1	19.354839	42.521994	100.0	0.0	0.0	0.0	52023.0
3	02601	153	Block Group 3	17.852835	30.639324	73.2	11.8	11.1	0.0	24298.0
2	02657	101	Block Group 2	16.367713	42.152466	92.2	4.0	1.6	0.0	61833.0
3	02639	116	Block Group 3	16.083916	35.139860	100.0	0.0	0.0	0.0	39176.0
2	02601	153	Block Group 2	15.450644	28.397711	84.8	11.4	0.0	0.0	27053.0

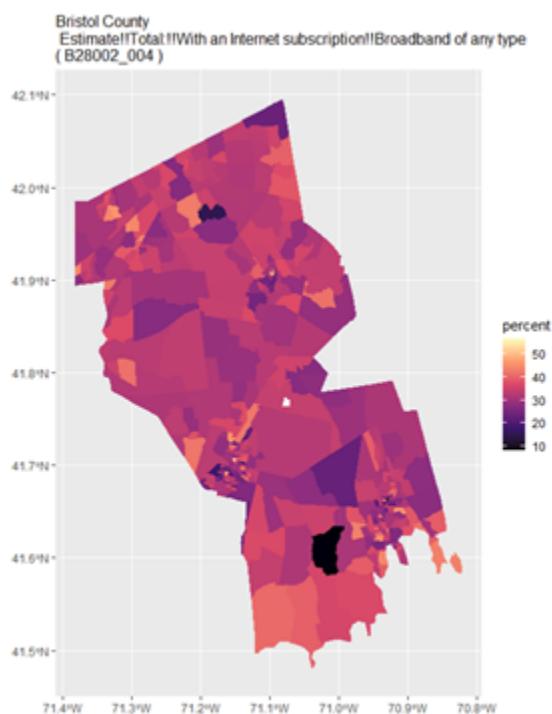
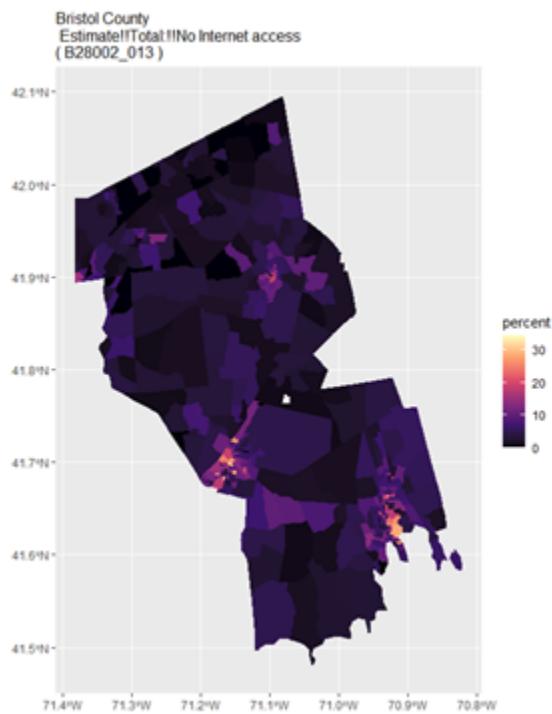
Berkshire County:



Berkshire County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
4	01247	9353	Block Group 4	28.663793	28.232759	100.0	0.0	0.0	0.0	18301.0
2	01201	9001	Block Group 2	24.905660	29.056604	89.2	1.8	1.3	0.0	21432.0
3	01201	9001	Block Group 3	18.911175	46.131805	83.4	4.6	0.0	0.0	42373.0
1	01247	9213	Block Group 1	18.843120	27.519720	89.8	0.0	2.8	0.0	26829.0
6	01201	9002	Block Group 6	18.271120	29.076621	76.4	13.0	4.3	0.0	22537.0
3	01201	9006	Block Group 3	17.995910	20.449898	67.5	27.6	0.0	0.0	16951.0
1	01201	9011	Block Group 1	17.173913	31.521739	100.0	0.0	0.0	0.0	30468.0
4	01226	9121	Block Group 4	16.932907	28.913738	97.6	1.1	0.0	0.0	24620.0
5	01201	9009	Block Group 5	15.221239	51.504425	97.5	2.5	0.0	0.0	93983.0
1	01201	9001	Block Group 1	14.226519	39.779006	76.8	12.3	1.5	0.0	21339.0

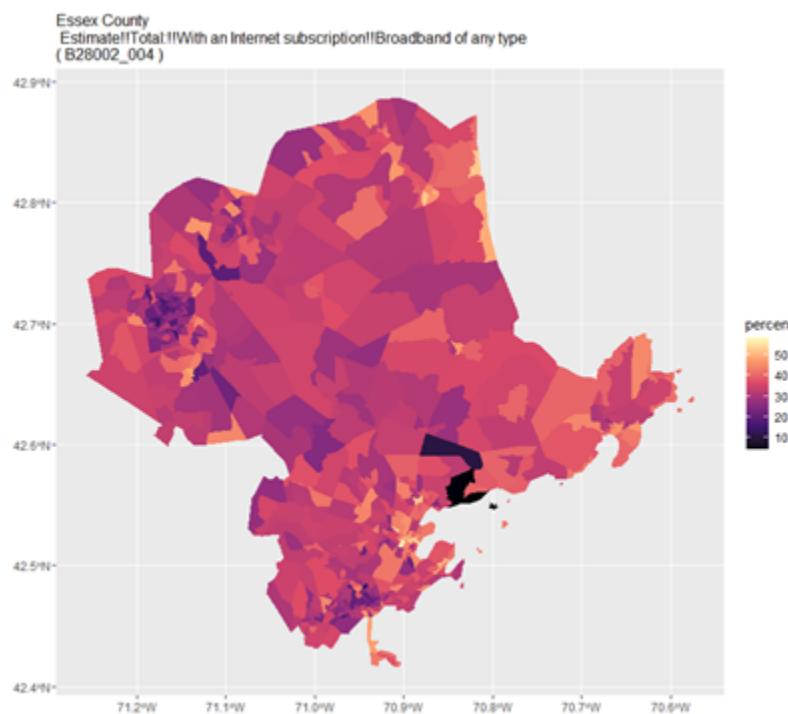
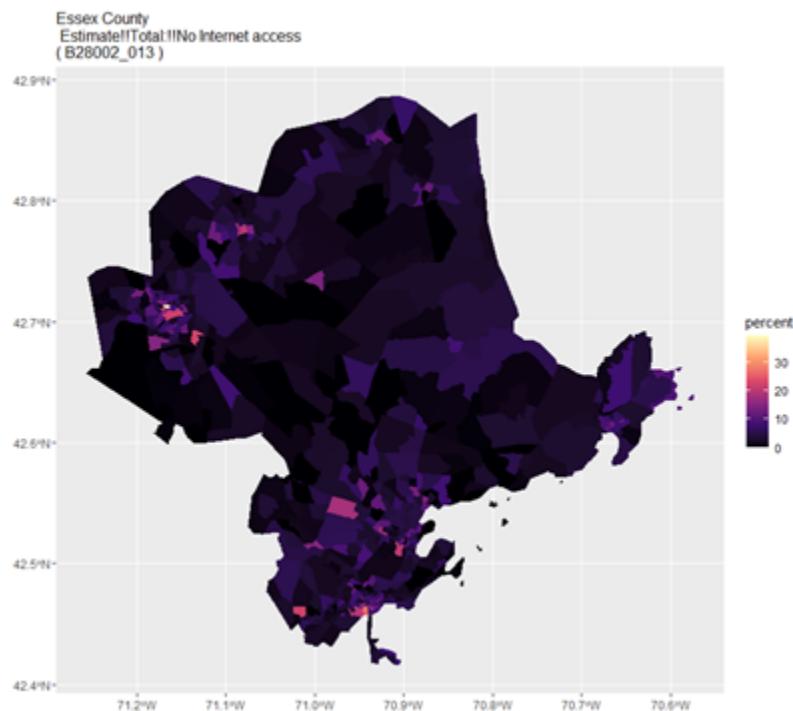
Bristol County:



Bristol County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
2	02722	6411.01	Block Group 2	34.251291	18.760757	66.8	6.5	0.0	0.0	19228.0
2	02724	6402	Block Group 2	29.629630	28.104575	85.4	8.9	0.0	0.0	15034.0
1	02740	6519	Block Group 1	28.322440	26.579521	30.3	8.1	0.0	0.0	17781.0
1	02721	6406	Block Group 1	28.067227	24.873950	84.2	12.8	0.0	0.0	25936.0
1	02722	6411.01	Block Group 1	27.979798	23.535354	77.1	13.3	0.0	0.0	17063.0
2	02720	6421	Block Group 2	26.641651	15.103189	71.0	1.9	0.0	0.0	22577.0
1	02724	6404	Block Group 1	26.509186	24.934383	88.7	7.3	0.0	0.0	37589.0
2	02744	6527	Block Group 2	26.339969	28.483920	67.5	6.1	0.0	0.0	20233.0
2	02740	6518	Block Group 2	26.284585	31.027668	62.5	5.9	0.0	0.0	20604.0
2	02746	6506	Block Group 2	26.020408	12.500000	61.1	6.6	0.0	0.0	11765.0

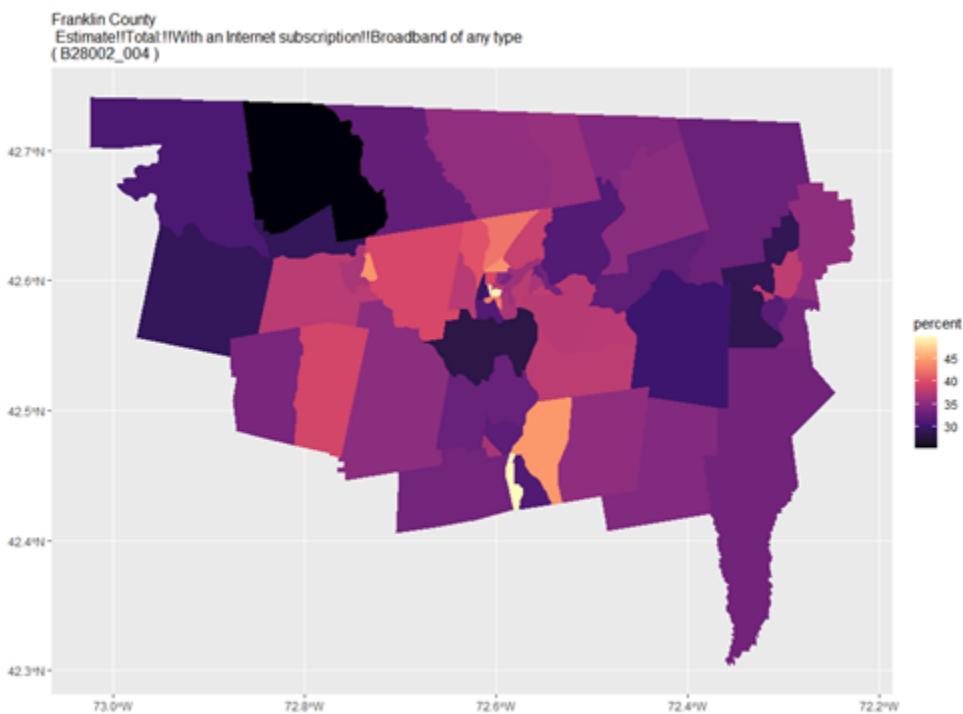
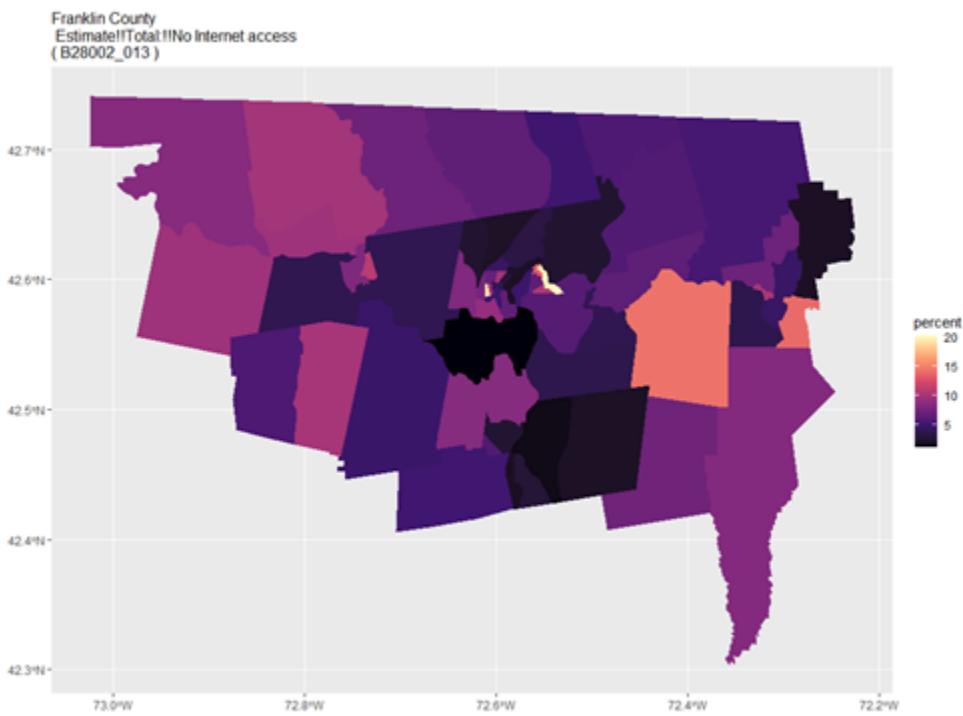
Essex County:



Essex County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
1	01841	2511	Block Group 1	39.262821	13.621795	67.5	4.2	0.0	0.0	15258.0
1	01902	2069	Block Group 1	28.383706	27.201051	78.3	17.1	0.0	2.9	18466.0
3	01902	2069	Block Group 3	26.109391	39.834881	64.0	32.6	0.0	0.0	14791.0
3	01845	2532.02	Block Group 3	22.548121	25.022915	90.0	1.3	5.3	0.0	31953.0
3	01906	2082	Block Group 3	22.056921	34.282018	88.4	4.6	5.3	0.0	40126.0
1	01840	2501	Block Group 1	21.835116	22.869955	49.7	6.1	0.0	0.6	23369.0
2	01841	2511	Block Group 2	20.703125	15.364583	42.1	15.1	0.0	0.0	18134.0
2	01970	2047.01	Block Group 2	20.146765	20.613742	58.8	13.1	6.5	0.0	22139.0
2	01830	2601	Block Group 2	20.098039	19.747899	79.3	11.1	2.2	0.0	18110.0
1	01902	2070	Block Group 1	19.757174	24.613687	47.0	27.6	0.0	0.0	18697.0

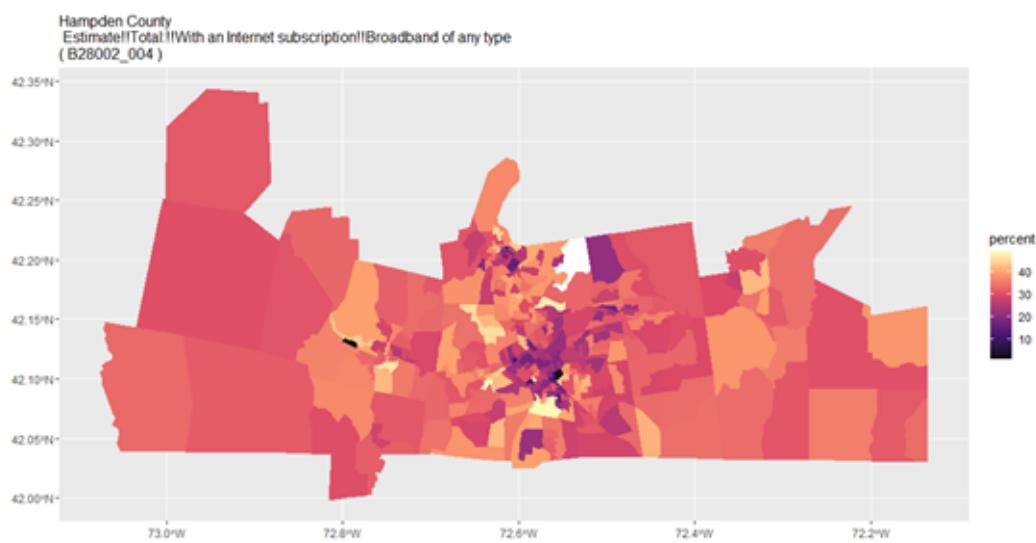
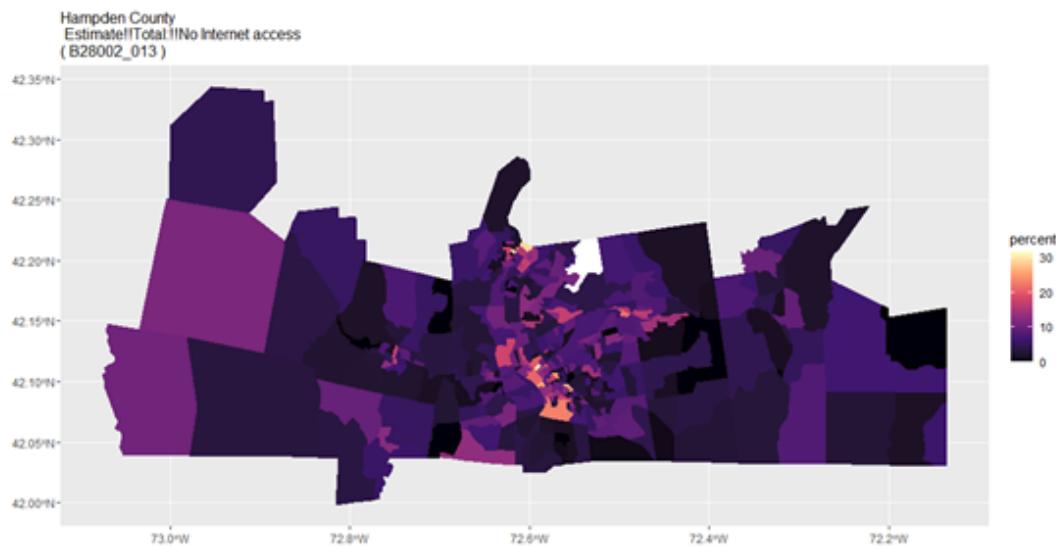
Franklin County:



Franklin County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
4	01376	407.01	Block Group 4	20.104439	32.114883	97.9	0.0	0.0	0.0	42906.0
1	01301	413	Block Group 1	19.429199	29.198683	100.0	0.0	0.0	0.0	19564.0
3	01344	404	Block Group 3	14.269142	4.640371	89.0	4.5	0.8	0.0	32244.0
3	01364	405.02	Block Group 3	13.894888	31.605472	95.3	1.2	0.0	0.0	24714.0
2	01376	407.01	Block Group 2	13.256007	30.985915	82.6	8.2	0.0	0.0	18634.0
4	01370	415.02	Block Group 4	10.814249	39.058524	92.7	1.3	6.0	0.0	43130.0
1	01351	407.02	Block Group 1	10.314875	35.287731	88.8	0.0	0.0	11.2	30777.0
3	01364	405.01	Block Group 3	10.092961	34.528552	93.8	0.5	0.0	3.9	32651.0
1	01330	415.01	Block Group 1	9.986684	23.701731	94.7	0.0	0.0	0.3	52493.0
2	01301	412	Block Group 2	9.828010	27.395577	99.3	0.7	0.0	0.0	35712.0

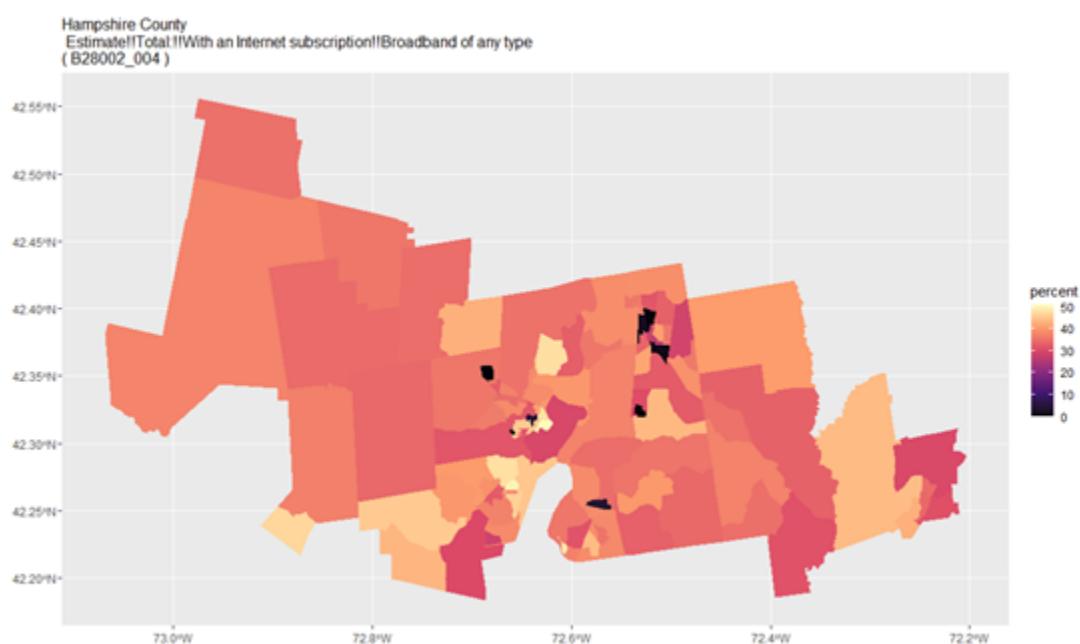
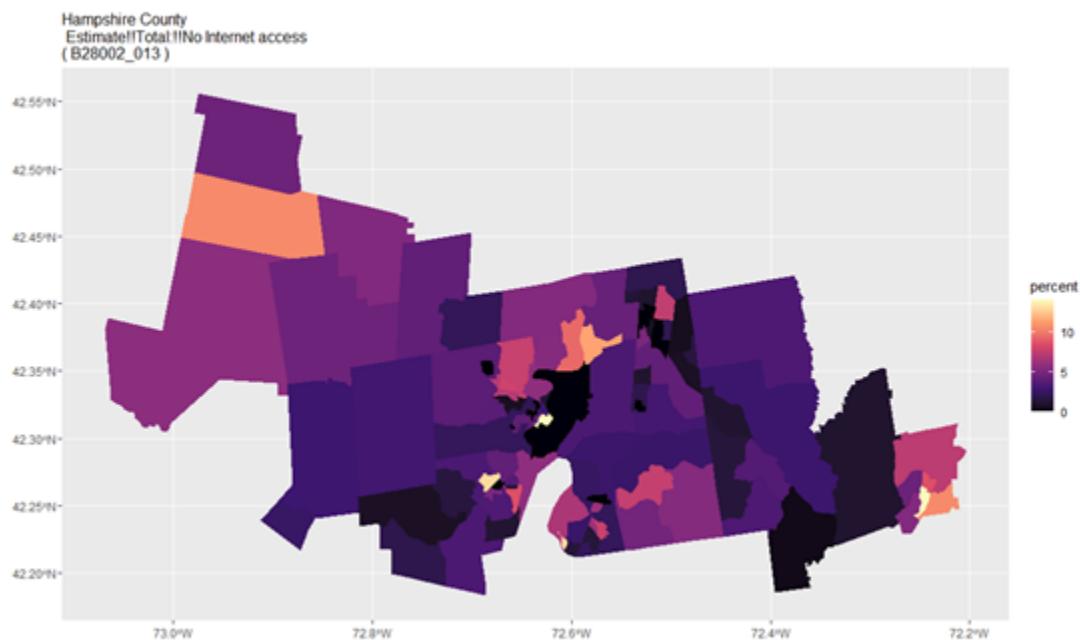
Hampden County:



Hampden County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
2	01104	8009	Block Group 2	31.524548	13.608958	82.0	14.6	0.0	0.0	14009.0
1	01040	8117	Block Group 1	29.039813	29.274005	78.5	0.0	0.0	0.0	31003.0
1	01040	8120.01	Block Group 1	28.821811	14.410906	89.0	3.5	0.0	0.0	18935.0
1	01108	8023	Block Group 1	27.086882	13.628620	87.9	8.2	0.0	0.0	17075.0
2	01105	8011.02	Block Group 2	26.027397	9.132420	79.2	8.2	0.0	0.0	8588.0
4	01109	8018	Block Group 4	25.323475	17.929760	52.3	40.7	0.0	0.0	19930.0
5	01108	8021	Block Group 5	23.048327	48.513011	67.3	1.1	13.4	0.0	33032.0
3	01151	8001.02	Block Group 3	21.592775	13.464696	65.9	29.1	0.0	0.0	17045.0
2	01040	8118	Block Group 2	21.508380	9.683426	97.1	1.3	0.0	0.0	16067.0
1	01101	8011.01	Block Group 1	20.760234	25.087719	50.1	15.0	0.8	0.5	18058.0

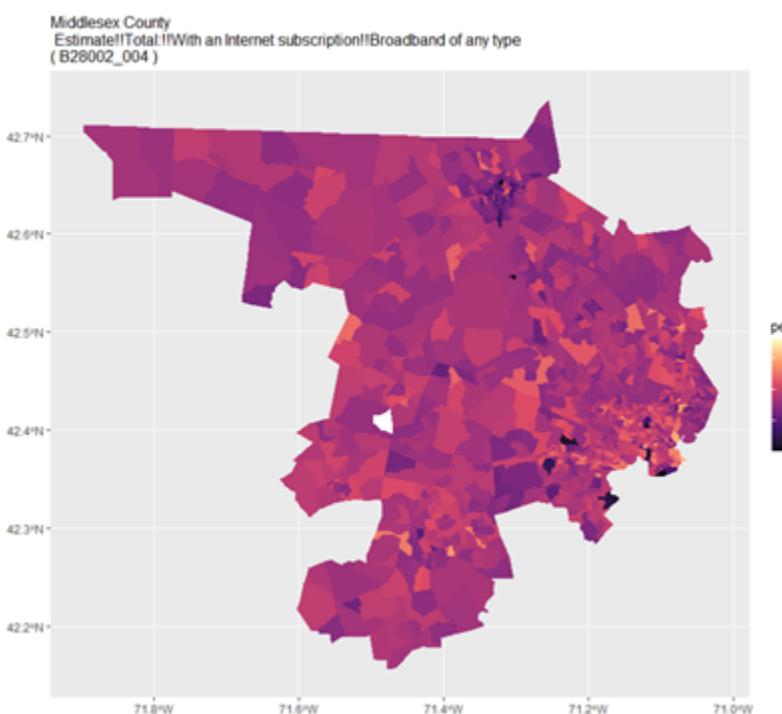
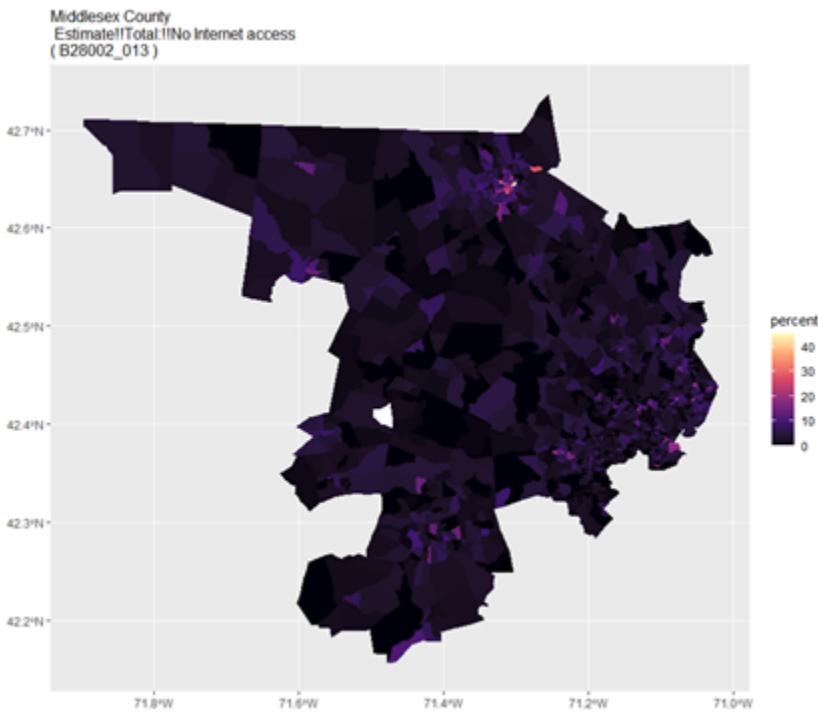
Hampshire County:



Hampshire County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
3	01060	8219.03	Block Group 3	13.998704	48.282566	91.4	3.8	1.0	0.0	40839.0
2	01082	8201.02	Block Group 2	13.976165	31.419285	100.0	0.0	0.0	0.0	24152.0
4	01027	8224.02	Block Group 4	13.007160	36.276850	95.7	1.2	0.0	0.0	56401.0
5	01075	8211	Block Group 5	12.997904	45.492662	99.8	0.2	0.0	0.0	38740.0
2	01035	8214	Block Group 2	11.372064	33.745365	92.6	2.7	0.0	0.0	44212.0
1	01082	8201.02	Block Group 1	10.570236	29.902643	93.5	4.6	0.0	0.0	33279.0
2	01026	8227	Block Group 2	10.532544	26.627219	98.1	0.0	0.6	0.0	34204.0
1	01038	8215	Block Group 1	9.371884	28.813559	96.5	0.4	0.0	2.2	33703.0
3	01082	8201.02	Block Group 3	8.559201	27.627199	93.6	2.6	0.0	0.0	21770.0
2	01027	8223	Block Group 2	8.547889	41.400618	92.8	6.0	0.0	0.0	32156.0

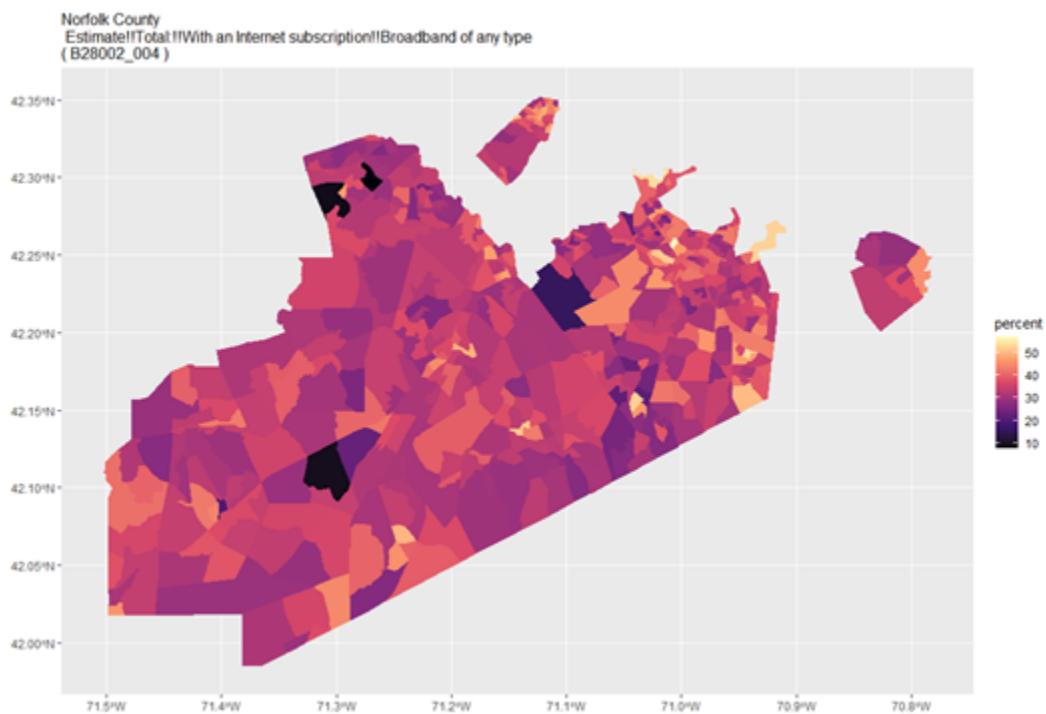
Middlesex County



Middlesex County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
1	01852	3124	Block Group 1	45.109780	14.171657	67.3	3.6	11.8	0.0	18630.0
1	01854	3883	Block Group 1	31.295201	15.910585	67.6	3.7	12.0	0.0	8671.0
2	01826	3143.01	Block Group 2	28.000000	18.400000	62.7	16.6	16.3	0.0	25954.0
2	01852	3119	Block Group 2	26.457399	24.065770	60.7	6.4	19.7	2.2	16359.0
1	01850	3104	Block Group 1	20.833333	12.500000	80.3	9.7	9.9	0.0	15540.0
1	01852	3101	Block Group 1	19.166057	10.460863	63.4	20.6	7.5	0.6	12294.0
1	02144	3507	Block Group 1	18.755981	30.526316	84.9	4.5	1.7	0.0	41172.0
1	02143	3515	Block Group 1	18.452381	41.468254	60.5	4.2	17.5	0.0	42984.0
6	02148	3418	Block Group 6	18.386243	31.746032	77.9	6.1	16.0	0.0	17035.0
1	01851	3112	Block Group 1	17.984361	20.590791	37.4	14.2	38.8	1.0	18603.0

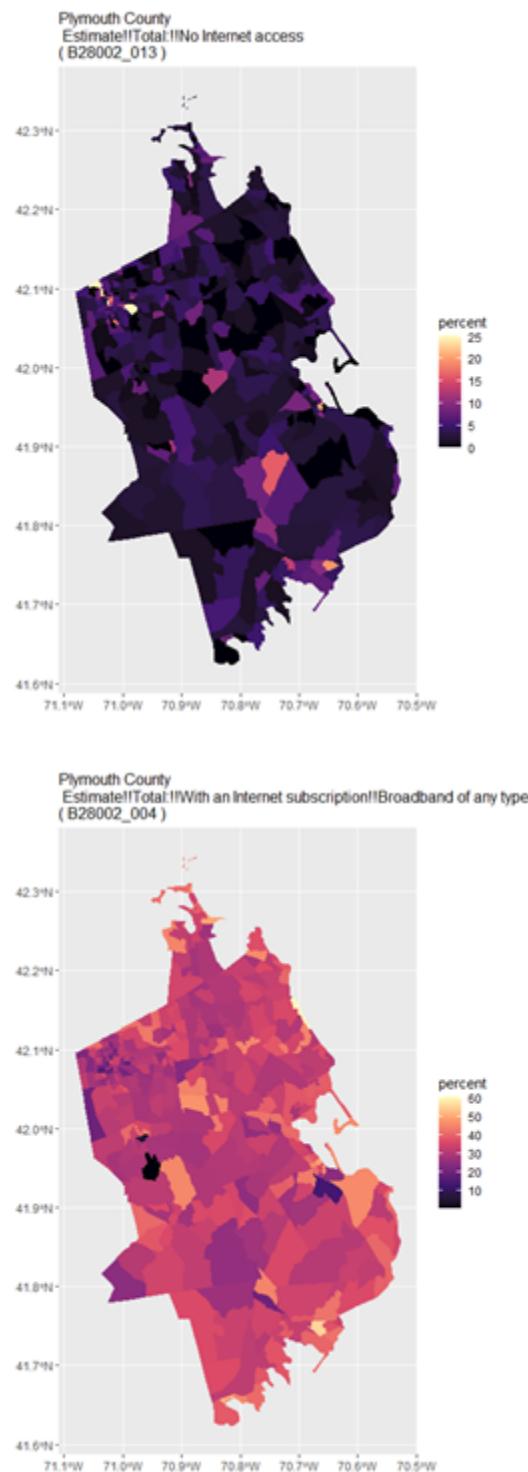
Norfolk County:



Norfolk County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
5	02186	4163	Block Group 5	26.162019	26.162019	51.1	45.2	0.0	0.0	57567.0
1	02170	4176.01	Block Group 1	23.044397	31.078224	83.7	3.2	13.1	0.0	49955.0
2	02169	4177.01	Block Group 2	19.498290	35.689852	70.6	2.1	27.4	0.0	26364.0
1	02188	4224	Block Group 1	19.281437	27.425150	91.3	0.0	1.8	0.0	29345.0
1	02343	4211	Block Group 1	16.845329	24.119449	72.7	12.4	4.2	0.0	29084.0
1	02062	4134.01	Block Group 1	15.091864	37.007874	88.1	11.8	0.0	0.0	38746.0
2	02169	4179.01	Block Group 2	14.900662	33.869442	60.4	5.5	21.6	0.0	33955.0
4	02169	4177.01	Block Group 4	14.769031	36.109304	63.3	4.5	29.3	0.2	33132.0
1	02171	4173	Block Group 1	14.739884	37.861272	77.7	4.2	18.0	0.0	45351.0
4	02169	4179.01	Block Group 4	13.728549	35.881435	45.7	0.3	45.1	0.0	26630.0

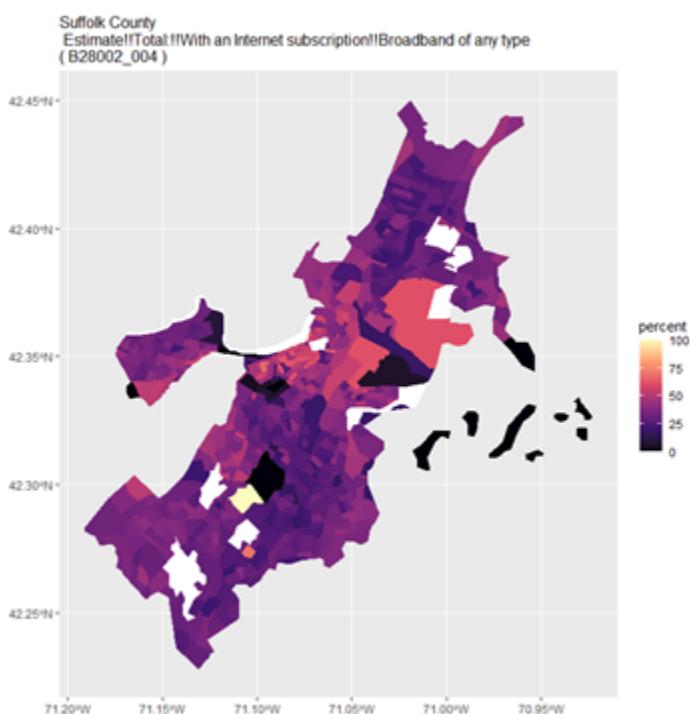
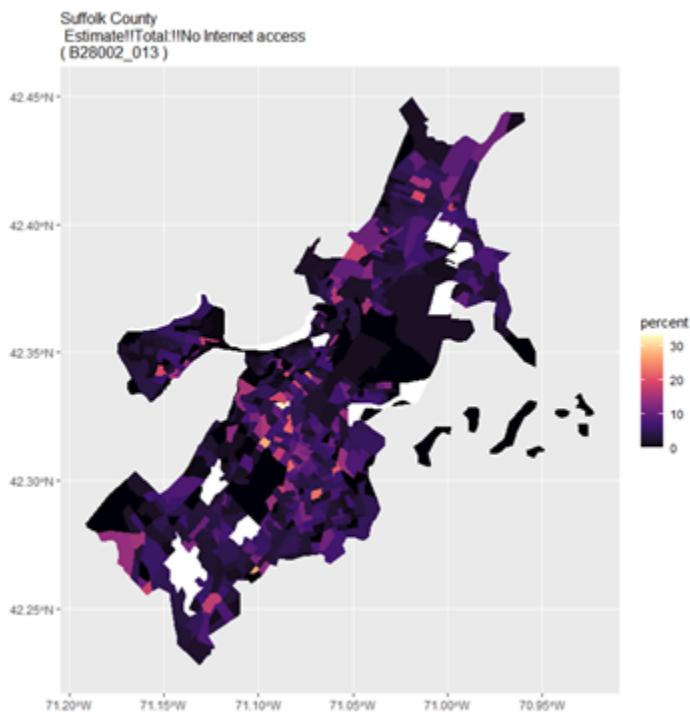
Plymouth County:



Plymouth County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
3	02301	5108	Block Group 3	25.173210	16.974596	28.3	71.7	0.0	0.0	10533.0
1	02302	5112	Block Group 1	25.075834	20.222447	40.6	37.1	0.0	0.0	18236.0
5	02301	5105.02	Block Group 5	24.978760	37.638063	57.5	37.9	0.0	1.4	30963.0
2	02301	5105.02	Block Group 2	23.349894	20.227111	22.7	59.4	0.0	0.0	18001.0
1	02360	5305	Block Group 1	20.845921	34.592145	99.8	0.2	0.0	0.0	30827.0
3	02532	5453	Block Group 3	19.708029	32.992701	97.7	2.3	0.0	0.0	38226.0
3	02301	5109	Block Group 3	19.092332	12.989045	37.1	48.0	0.8	0.0	11006.0
3	02301	5116	Block Group 3	17.300233	19.705198	26.5	70.2	0.9	0.0	21593.0
1	02301	5109	Block Group 1	16.883117	26.298701	43.8	42.9	0.0	0.0	21776.0
3	02330	5442	Block Group 3	16.167665	29.241517	97.9	0.0	0.0	0.0	26116.0

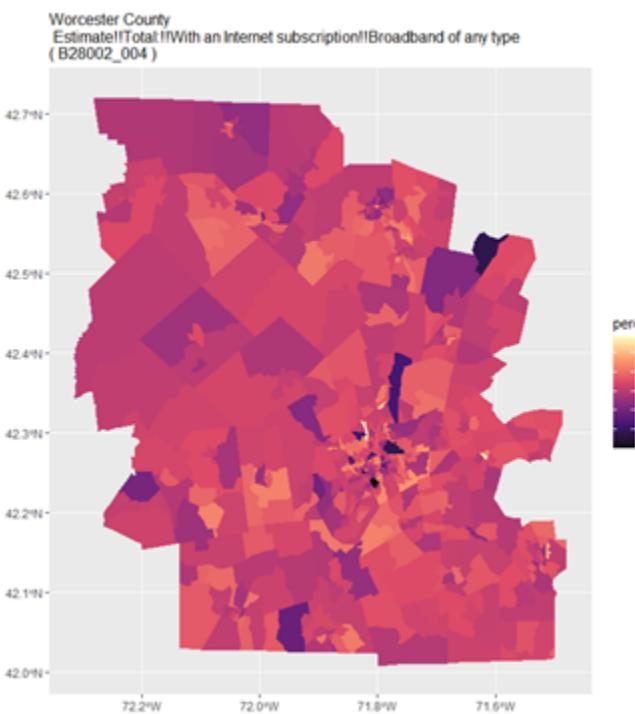
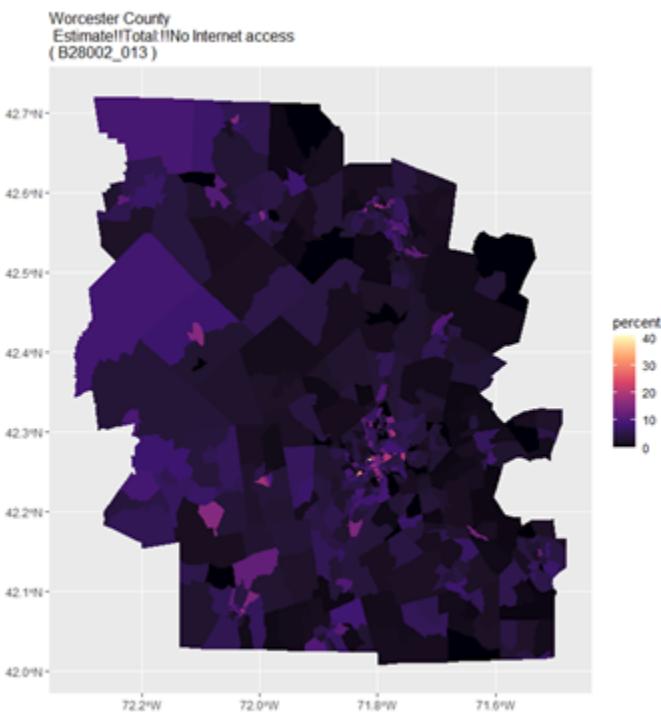
Suffolk County:



Suffolk County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
3	02119	806.01	Block Group 3	32.846715	23.114355	18.0	64.5	0.0	1.5	15363.0
1	02136	1404	Block Group 1	27.230047	18.153365	17.1	75.1	0.0	4.1	22420.0
1	02119	813	Block Group 1	27.223354	19.008826	28.1	29.7	1.7	0.0	16593.0
2	02118	705	Block Group 2	24.448217	38.539898	10.2	10.5	55.0	5.1	26183.0
4	02124	922	Block Group 4	22.737307	24.944812	40.6	37.5	1.5	0.0	33179.0
2	02119	817	Block Group 2	22.244290	27.706058	5.4	78.3	1.4	0.0	35839.0
1	02121	901	Block Group 1	21.917808	17.727639	7.3	58.7	0.0	0.0	17142.0
3	02122	916	Block Group 3	21.064815	23.379630	35.4	4.2	60.4	0.0	22623.0
1	02119	817	Block Group 1	20.449438	13.483146	2.9	60.7	0.0	0.0	11740.0
7	02151	1701	Block Group 7	19.322344	21.428571	68.5	4.7	2.7	0.0	23943.0

Worcester County:



Worcester County Demographics and Internet Information

	zip code	census tract	block group	% no internet	% internet with broadband subscription	% white	% black	% asian	% native american	mean income
2	01609	7315	Block Group 2	40.677966	40.042373	58.3	27.3	0.0	0.0	18998.0
1	01603	7312.03	Block Group 1	32.793807	24.349050	73.1	8.7	8.8	2.5	16195.0
1	01610	7314	Block Group 1	21.336761	23.521851	77.9	12.5	0.0	2.2	11004.0
5	01610	7326	Block Group 5	21.333333	20.266667	55.2	33.1	0.0	0.0	42966.0
1	01604	7322.01	Block Group 1	20.886814	35.355893	83.0	0.0	11.1	1.3	41307.0
3	01609	7316	Block Group 3	20.723918	33.002129	66.4	16.5	2.3	0.0	28977.0
6	01604	7318	Block Group 6	20.070012	30.046674	64.9	14.5	7.1	0.9	13611.0
4	01605	7304.01	Block Group 4	19.712352	20.558376	49.2	41.4	1.4	0.0	17595.0
2	01610	7325	Block Group 2	19.413919	22.588523	77.7	6.1	4.8	0.0	17573.0
2	01420	7107	Block Group 2	18.650794	28.174603	65.7	11.1	0.5	1.1	19979.0

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