

# Social Explorer



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<http://www.lib.umd.edu/gis>

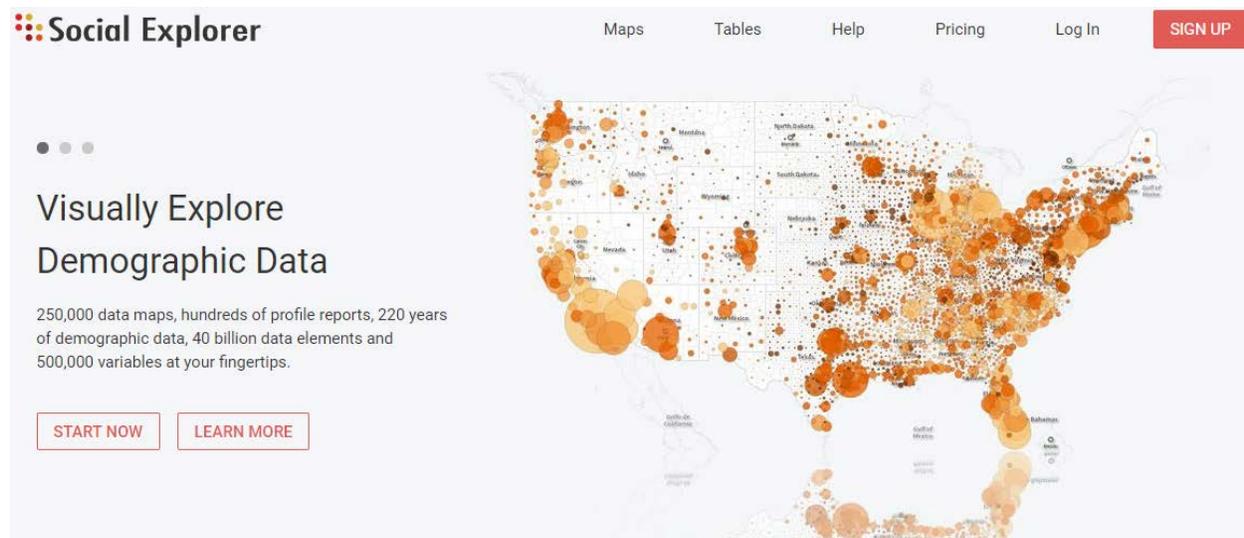
# Introduction to Social Explorer

This tutorial will introduce you to Social Explorer, an online mapping interface that allows users to explore and visualize demographic data. We will demonstrate the tool's basic capabilities and make example maps using income data from the American Community Survey (ACS) datasets. Upon completion of this exercise, you will understand how to generate, edit, and export a completed, customizable map. Optional instructions for how to download summary spreadsheet data from the ACS and Decennial Census are also provided. Brief explanations of these datasets are given at the end of this document.

## 1. Getting Started

Go to <https://www.lib.umd.edu/dbfinder> and search for Social Explorer and you should be able to see it as the first option. Create an account to proceed.

- A. From the Social Explorer homepage, clicking the Start Now button will take you directly to the mapping interface. An optional tour is offered, but we will skip that for now. You should find yourself looking at a map of North America, with the United States highlighted. By default the map displays Population Density (per sq. mile) by State based on the latest estimates from the 5-year American Community Survey (ACS). The colors are graduated so that lighter areas represent lower population density, while darker areas have higher population density.

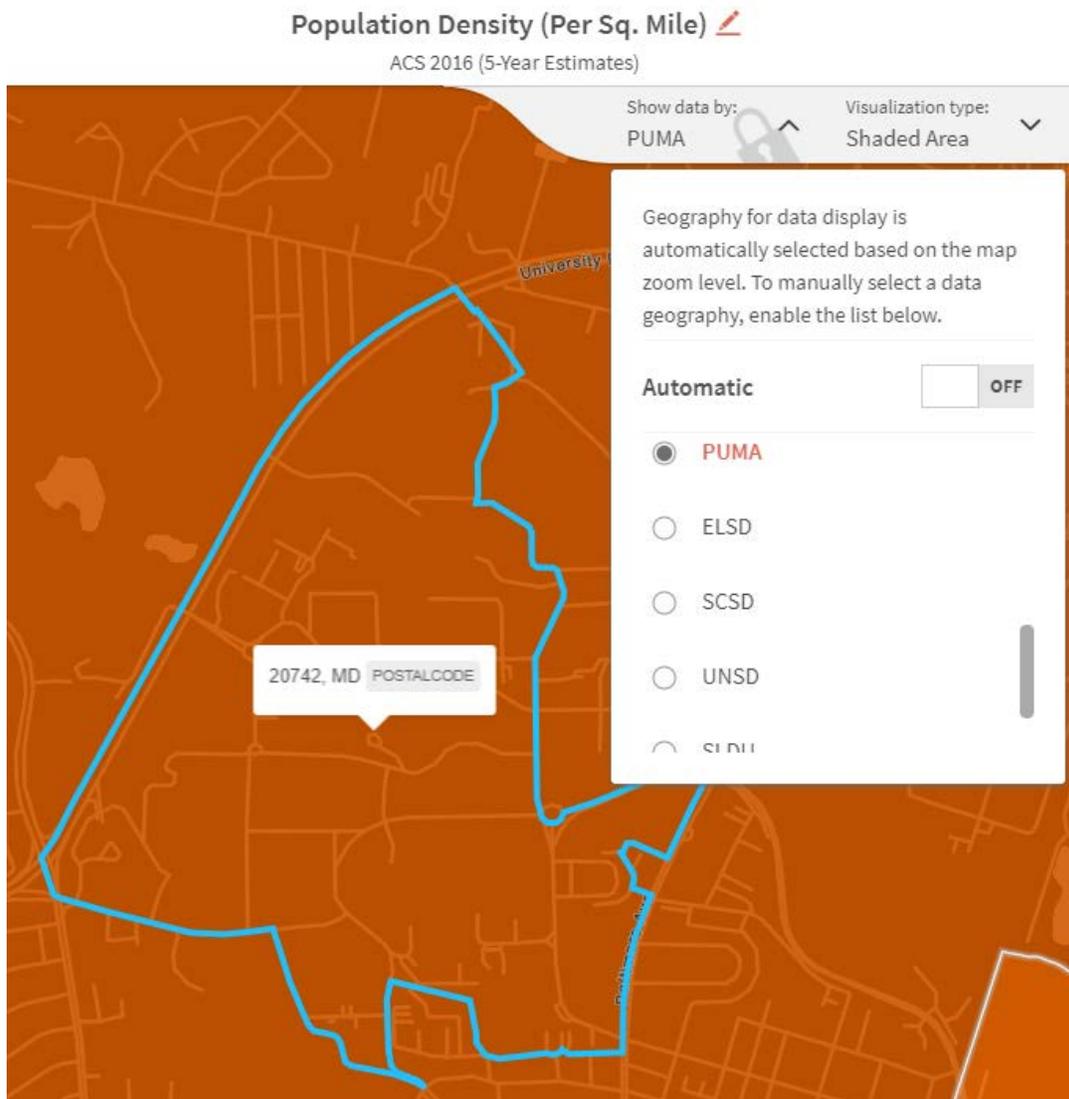


- B. Using the search bar in the upper left-hand corner of the map, type "College Park, MD 20742" (the address for UMD, College Park), press enter, and the map will zoom to that location, as well as mark it on the map. Note that the map is now divided into smaller units called census tracts. If you hover the cursor over a census tract on the map, you will see information pop up detailing the number of the tract, as well as the population

density estimate for that tract. The color bar at the top of the screen shows which colors correspond to which population densities.

## 2. Navigation

- A. Practice moving around by left-clicking and dragging the mouse to pan across the map. Use the mouse wheel to zoom in and out, or click the +/- buttons in the lower left-hand corner of the map. Notice how the map auto-regenerates as you move or alter the scale.
- B. Social Explorer offers multiple ways to view data. Under the map title, you will see a tab labeled Show data by, clicking this will open a drop-down menu of options. In order to activate these options, you must click the switch next to Automatic from On to Off. Click the bubble next to PUMA and see what happens to the map.



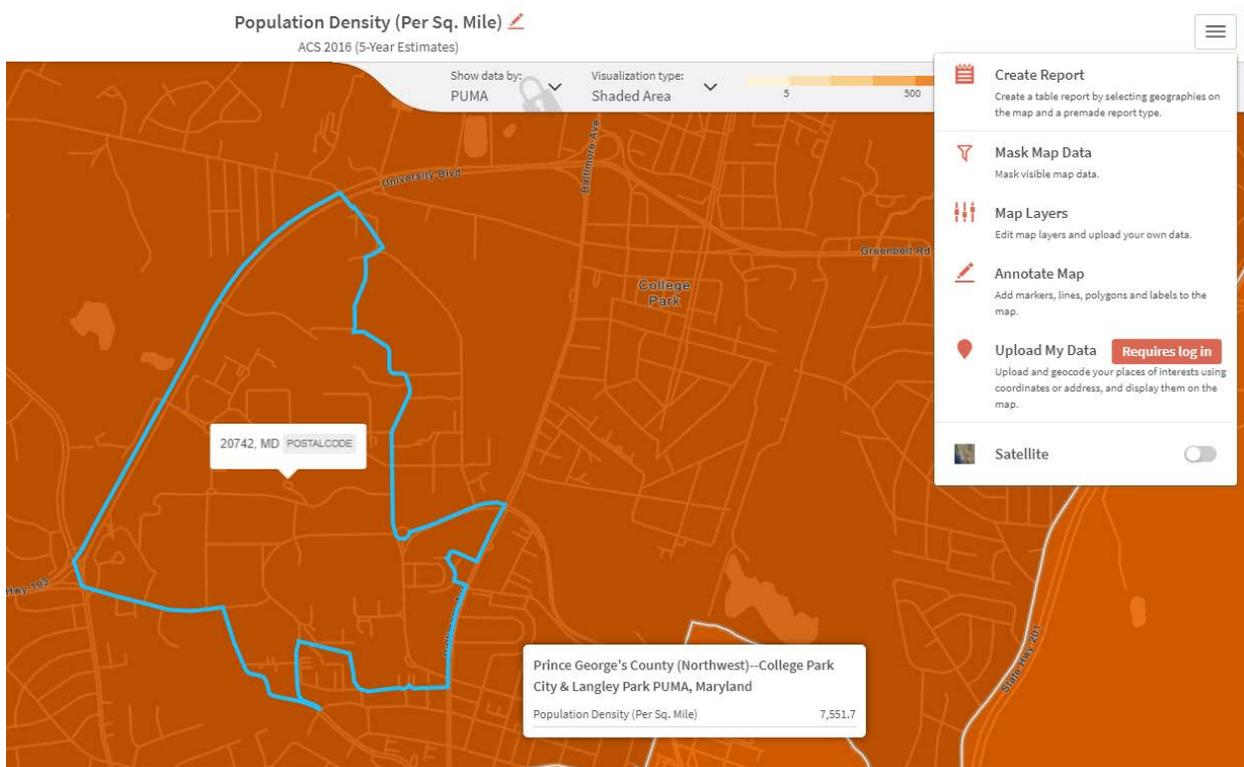
For this exercise we will concentrate on PUMAs and Census Tracts, which are defined as:

**PUMA** : Public Use Microdata Area – a statistical area designed to have an optimal size of 100k residents, created by aggregating census tracts. PUMAs never cross state boundaries. Available in all the ACS estimates.

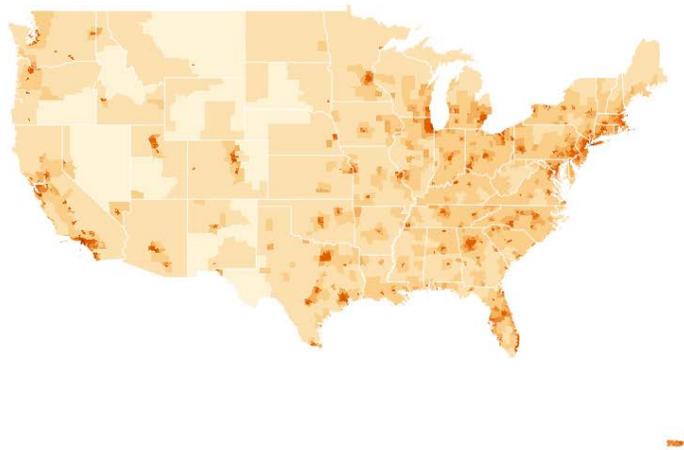
**Census Tract** : a statistical area designed to have an optimal size of 4,000 residents, with a general range of 1,200 to 8,000. Tracts never cross county boundaries. Available in the decennial census and ACS 5-year estimates.

### 3. Make a Map

Most of the major map editing functions are accessible through the Menu button, located in the upper right-hand corner of the screen.



In the Map Layers tab, leave boxes from Landmass: US to Data turned On. Also, leave the following turned on: Boundaries: States through Boundaries: Census Place (2016) and Labels: States (2016) and Labels: Counties (2010) and Show Census Tract Label On. Turn everything else to Off. Click Done. Zoom out and you will see that the map view window now only contains the geography of the United States.



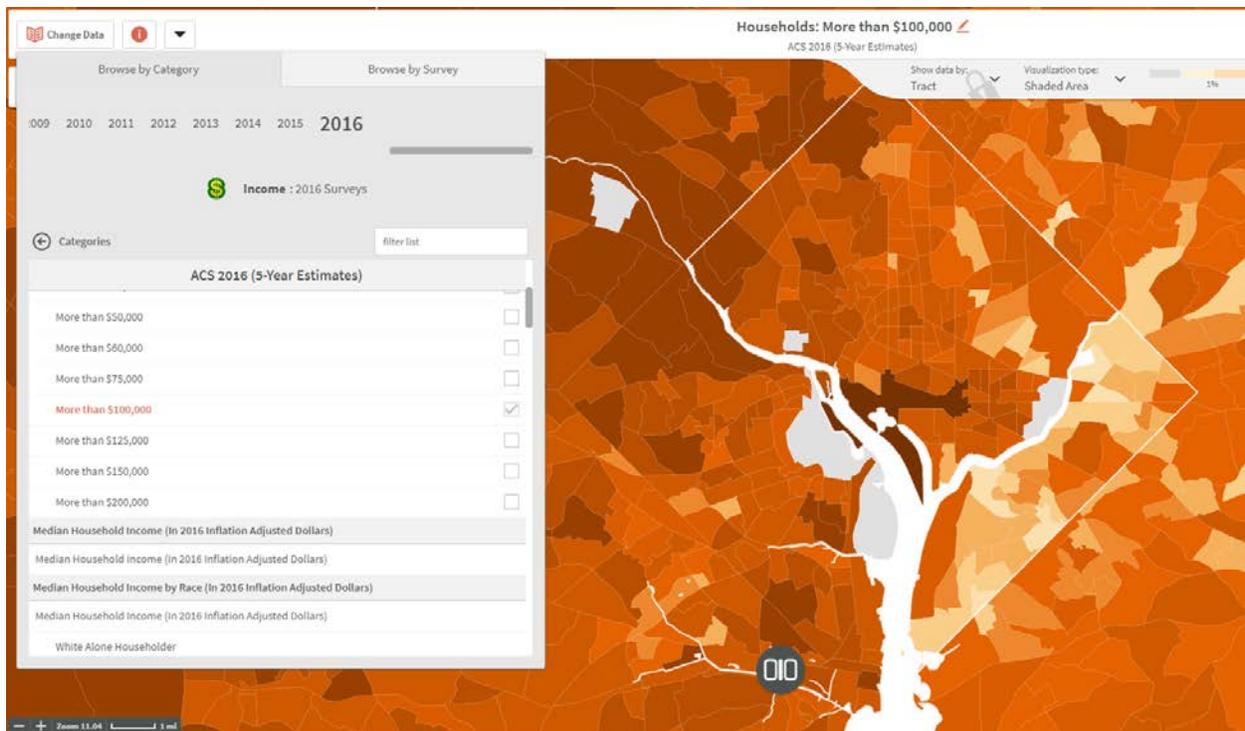
Edit Map
Done

Layers	Settings
US Water Area (2010)	<input type="checkbox"/>
US Water Area (2010)	<input type="checkbox"/>
US Landmark Area (2010)	<input checked="" type="checkbox"/>
Streets: (2010)	<input type="checkbox"/>
Show: Primary and Secondary Streets (2010)	<input type="checkbox"/>
Boundaries: Census Tracts (2016)	<input checked="" type="checkbox"/>
Boundaries: Counties (2016)	<input checked="" type="checkbox"/>
Boundaries: States	<input checked="" type="checkbox"/>
Boundaries: US-Canada; US-Mexico	<input checked="" type="checkbox"/>
Boundaries: Census Block Group (2016)	<input checked="" type="checkbox"/>
Boundaries: 5-Digit ZIP Code Tabulation Area (ZCTA5)	<input checked="" type="checkbox"/>
Boundaries: Census Place (2016)	<input checked="" type="checkbox"/>
Boundaries: Metropolitan Statistical Area (MSA)	<input type="checkbox"/>
Boundaries: Congressional Districts (115th)	<input type="checkbox"/>
Boundaries: Public Use Microdata Area (PUMA) 2016	<input checked="" type="checkbox"/>
Boundaries: Elementary School District (ELSD)	<input type="checkbox"/>

Note: The following images have the above-mentioned Layer settings turned off, and therefore do not contain major streets and landmark names that would be generated if the settings were left on.

- A. Let's visualize data other than Population Density. Zoom back in to Washington DC. In the Show data by drop-down menu, change the selection to Census Tract.
- B. The Change Data button in the upper left-hand corner of the screen allows you to explore the available data. Click the Browse by Category tab, and you will see numerous pre-categorized options based on the ACS 2016 (5-year) estimates.

As an example, say we wanted to look at income distribution across Washington DC. Click the Income option, and under Household Income (In 2016 Inflation Adjusted Dollars) – Cumulative (More), check the box for More than \$100,000. The map should generate automatically upon clicking the variable within the list.

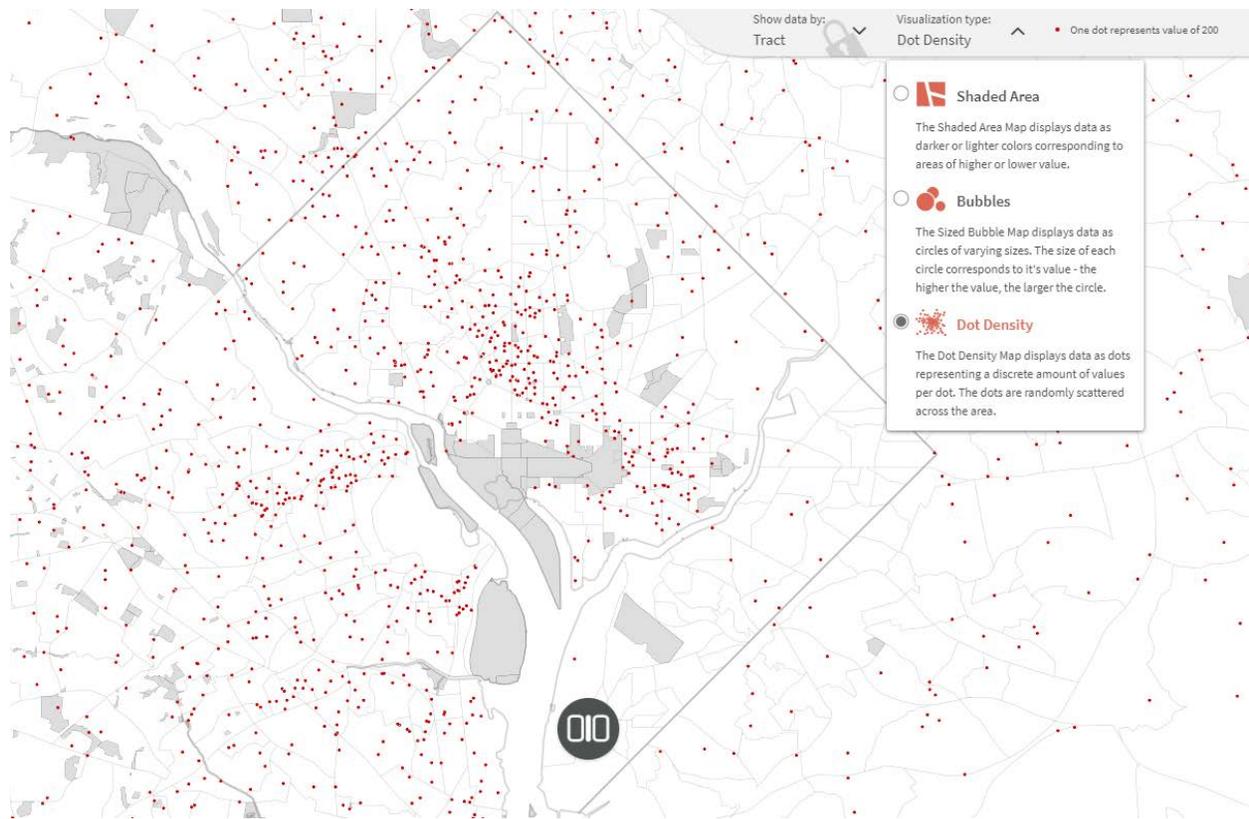


By default, the options that appear when you click Income or any other one of these categories (i.e. Population, Age, Sex) represent individual variables compiled using the latest ACS 5-year survey estimates. The longer period estimates (5-year) appear at the top, and shorter period estimates (3-year, 1-year) appear as you scroll down the page.

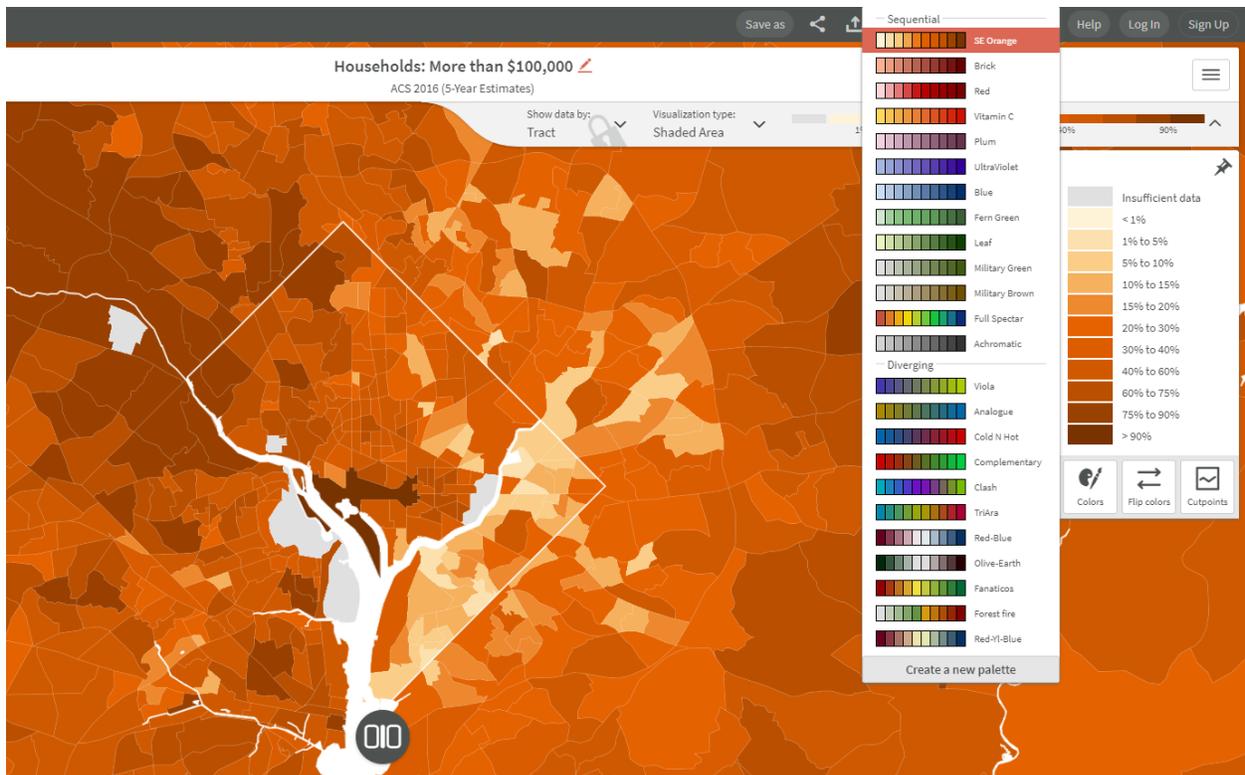
- C. You should now have in front of you a map color-coded by the quantity of households with Incomes greater than \$100,000 per census tract. Mouse over the census tracts to see the estimated number of Households in a given tract, and the estimated number and percentage of those households that have Incomes greater than \$100,000.

To help you better understand the data you are looking at, Social Explorer provides a data dictionary with documentation you can access with a click. In the upper-left corner, click the information button next to the Change Data button. Click Open data dictionary in the popup.

- D. The Income above \$100,000 data is currently displayed using shaded areas (Tracts) with a graduated color scheme, but this is not the only way it can be viewed. Social Explorer offers three ways to visualize your data: Shaded area, Bubbles, and Dot Density. Some of the data categories will not show all three of these options because of the nature of the data. For example, Dot Density would not work with the Median Income variable because that data is not given as a count. Our Income above \$100,000 data will work, however, since it is based on an estimated count of Households with Income over \$100,000. Click the Visualization Type menu at the top of the screen, and select Dot Density.

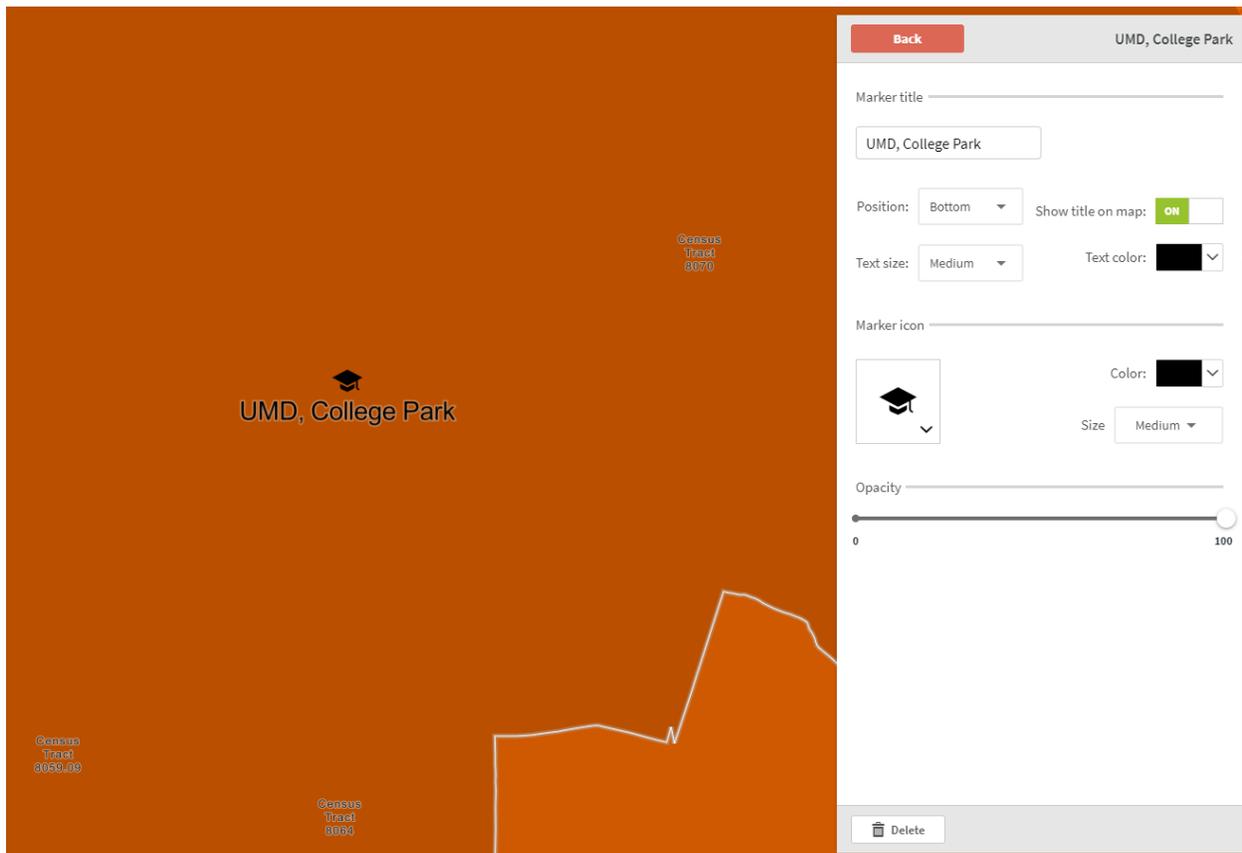


- E. Change the Visualization Type back to Shaded Area. If you are not happy with the automatic color scheme generated by the program, you can change it by clicking the drop-down arrow next to the color-coded key in the upper right-hand corner. Click the Colors button and select a different color scheme. Ideally, you want something that is graduated (i.e. goes from lightest to darkest) since our data represent increasing quantities.

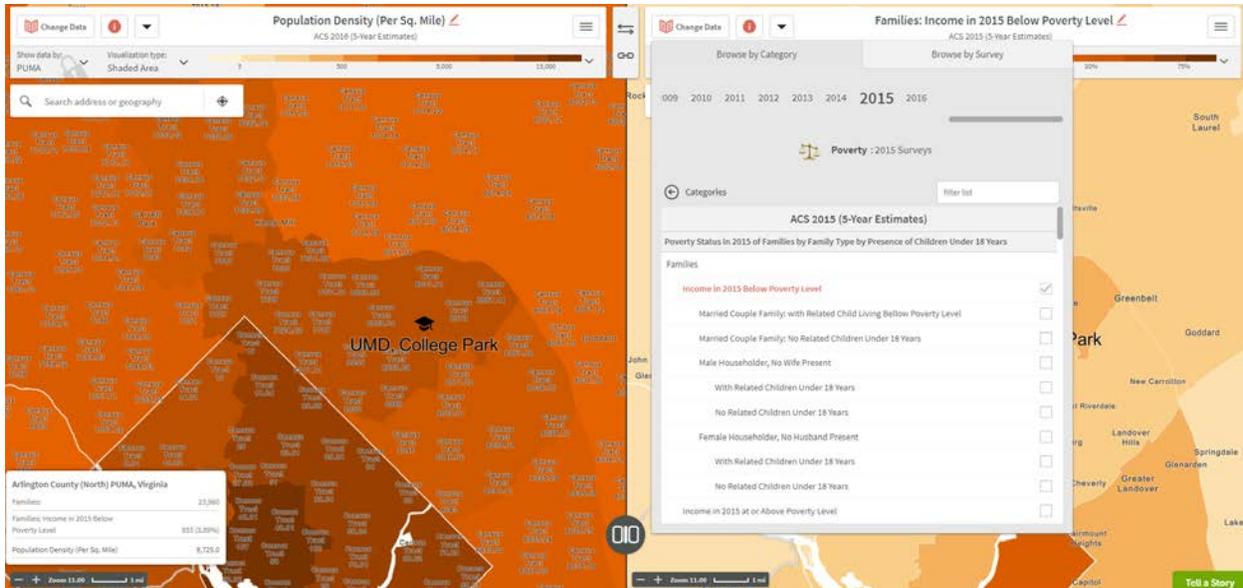


- F. Type "College Park, MD 20742" into the search bar to place a marker over that address (UMD). Mousing over that census tract shows that it is located in Census Tract 8072, and that an estimated 75.5% of the households in that tract have incomes greater than \$100,000.
- G. Go to the Menu button, and click Annotate Map. Click the Marker button, and click on Census Tract 8072 to place a marker there. In the box under Marker Title, type "UMD, College Park" and then change the Show title on map switch to On. Set the Text color to black. Click the button under Marker Icon to change the appearance of the icon. Since UMD is a College, let's select the college marker to change the icon to a graduation cap, and change it's color to black. Click Back, and then Click Done to finalize your changes.

## 4. Produce a Double Layout Map



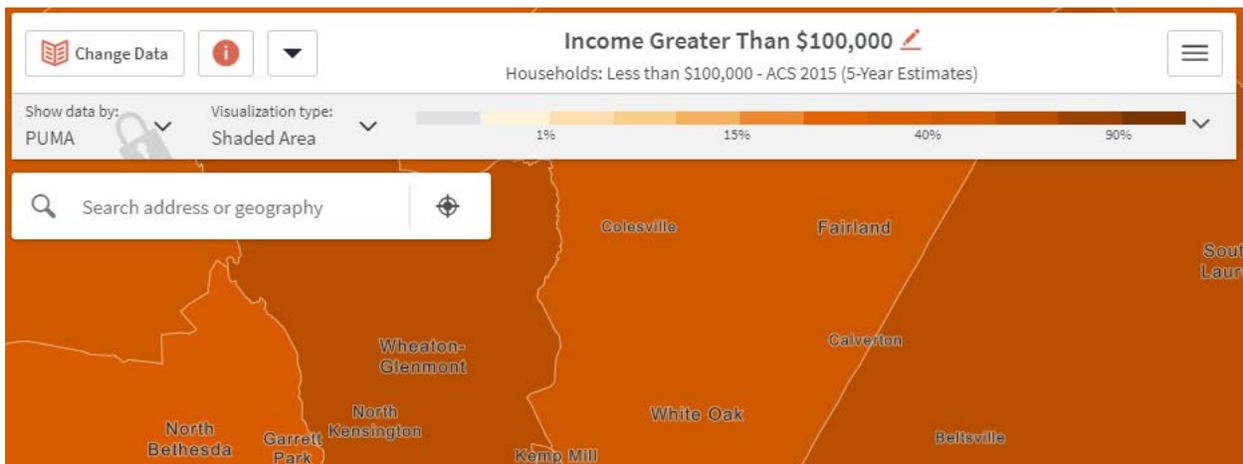
- A. Let's say that you wanted to compare census tracts with high incomes to those that have a high number of households living below the poverty line. You can create a second map and edit it independently from the first by clicking the round button in the lower center of the map screen. Click the black circular (double-layout) button in the lower center of the screen and select Side by side to generate a second copy of the map screen, which should replicate your Income greater than \$100,000 data.
- B. In one of the map windows, go to the Change Data button, and navigate to the Poverty category (under the Browse by Category tab). Select 2015 as your year and check the box next to Income in 2015 below poverty level to display it on the map.



For more information on how the ACS defines “household” and “poverty,” go to the Menu button and click Data Dictionary.

Note: If you mouse over a census tract, the information box will now display information from both variables shown in your maps, regardless of which side you are on.

- C. Zoom both maps out to the same scale (try 1 mile, shown on the scale bar at the bottom left of the screens), and position UMD, College Park in the center of each window.
- D. The map titles can be edited by clicking the Edit button next to the existing title (which by default displays the survey and variable names). Change the title on the poverty map to “Income in 2015 below Poverty Level” and the high income map title to “Income Greater Than \$100,000,” leave the source designations as they are.



## 5. Export Your Map

- A. When you are satisfied with your completed map, Social Explorer allows you to export it in a variety of formats. It will export whatever your current view shows, so position your map windows so that they show the same view at the same scale.
- B. Click the Export button on the upper right portion of the screen, and you will be given the option to export your map as an Image or as a Powerpoint slide.



Choose “Current screen resolution” and click Prepare to download. Once your image is ready, simply click Download Image to save it to your computer.

## 6. Historic Maps

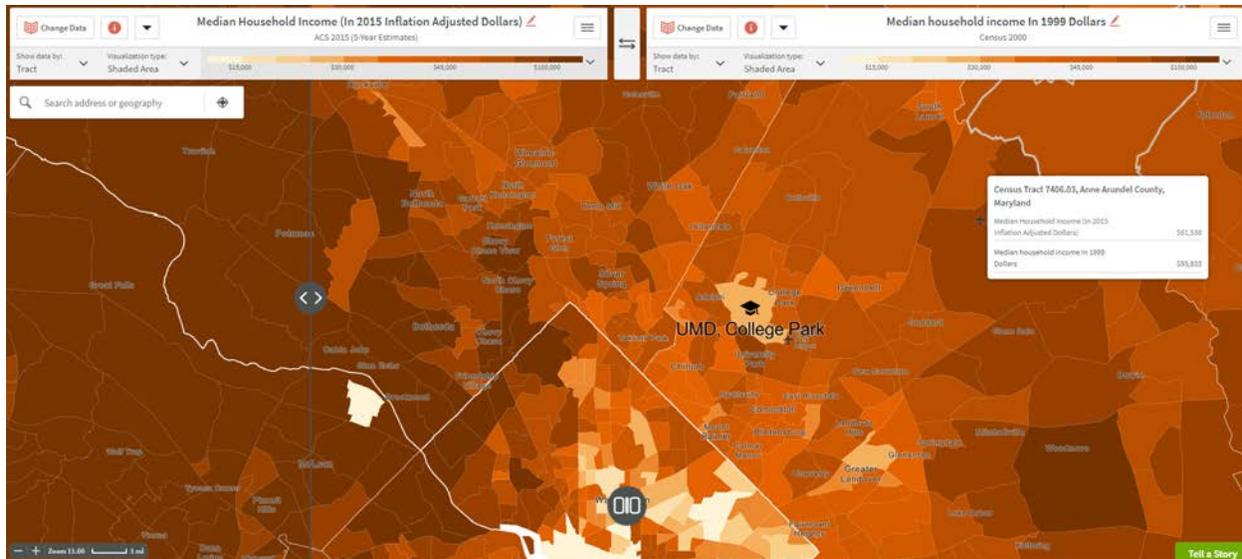
Social Explorer has access to data that in some cases goes as far back as 1790. If you click a category under the Change Data button, you can use the sliding bar at the top of the variable list menu to see all the years for which data from that category is available.

In this section we will compare the Median Income data from 2016 with the Median Income data from 2000 to create a comparative side-by-side map, and introduce the Swipe tool.

- A. Since we have been using data from the Income category, let’s look at a different Income variable. In one of your two map windows, go to the Change Data button, and under Income, scroll down to the Median household income variable and check the box to display it.

Do the same for your second window, only this time, slide the Survey year bar at the top of the Browse by Category tab to the year 2000. Scroll down to Median household income in 1999 Dollars and select it. Now you have a side-by-side map comparing median income by census tract for the years 2000 and 2016.

Note: The income data for the year 2000 is based on the Decennial Census, a nationwide demographic survey conducted every ten years. Prior to the release of the ACS in 2005, detailed socioeconomic variables were available as part of the ten-year census.



- B. Now slide the bar that divides the two map windows back and forth across the screen. This allows you to visualize the changes in Median Household Income over time. In order to do this, you have to press the bottom center map button and choose 'swipe'

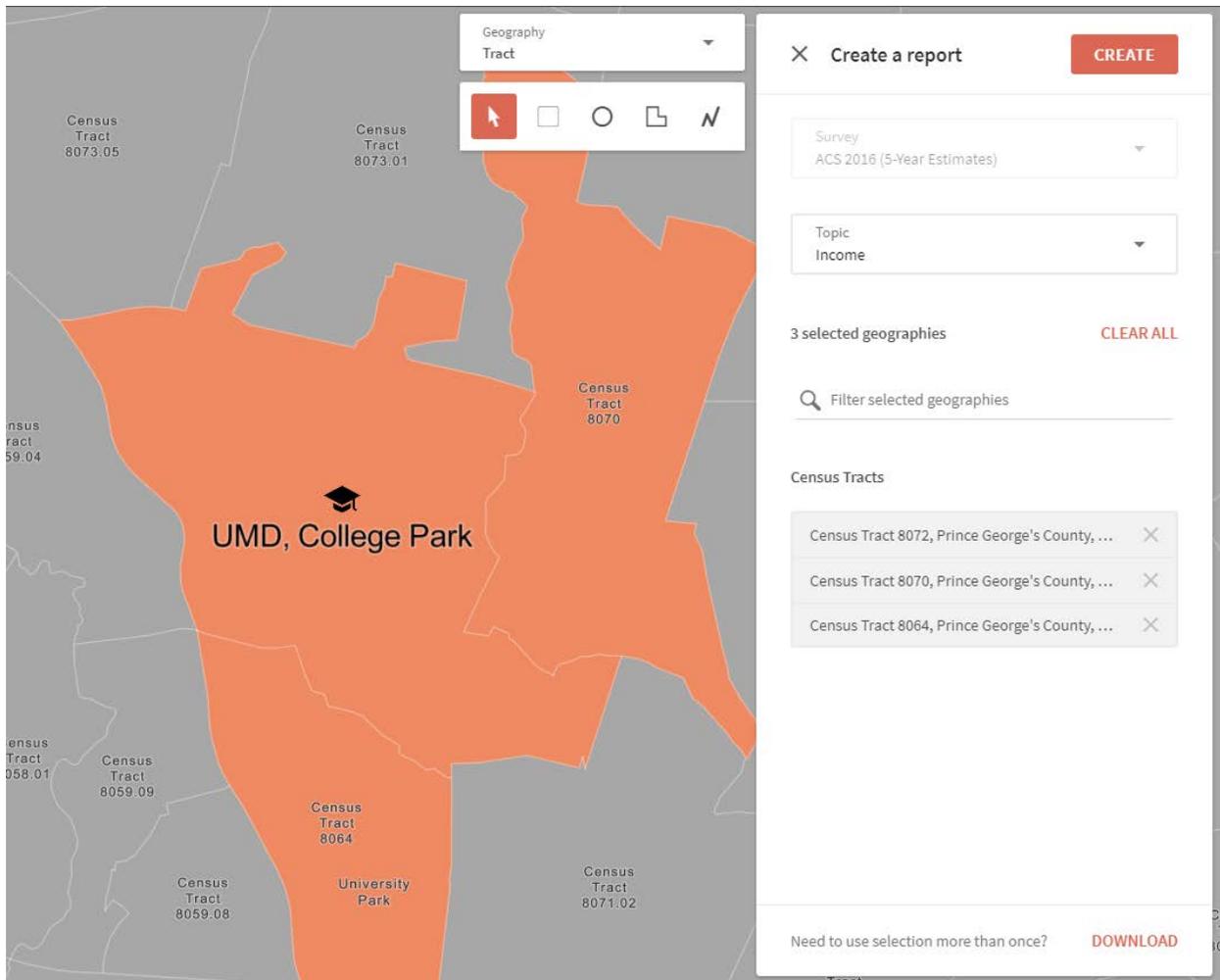
## 7. Create a Report

While Social Explorer is primarily a map-making tool, it can also be used to produce downloadable tables. You can access this feature without making a map.

- A. If you wish to download a summary table of the variables listed under each category, click the Menu button and click Create Report. Make sure ACS 2016 (5–Year Estimates) is selected, then under Select a Topic, click Income. You might have to scroll up to find it.

On the map, find and select Census Tract 8072 to generate a table specifically for that geography. You can alternatively select multiple census tracts, and the report will contain columns for each of them, as well as a Total column that adds up all of the count values for the tracts selected (this is particularly useful if you are examining neighborhoods).

Add the two tracts adjacent to Tract 8072 (Tracts 8064 and 8070) to your selections. Click Create at the top of the window and you will be redirected to a new tab containing the data table.



- A. You can download the data report in different formats. Click the Excel tab and choose whichever version of the software you like to create the report. Unfortunately, there are no filtering options, so you must download the entire report for a data category and then edit the Excel table if you wish to isolate certain variables.

# ACS 2016 (5-Year Estimates)

[Choose survey/year](#) ▶ [Geographies](#) ▶ [Tables](#) ▶ [Results](#)

Report

Excel

Data Download

Download the report as a Microsoft Excel file. Several versions of Excel are supported: 2007, 2003, 2000 and '97. 255 geographies, they will be output on separate sheets. You may also choose to output just the totals.

Please set options before you download the report:

Adjust \$ values for inflation to:

General options:

Output percents

Output totals only (aggregates)

Formatting:

Download Microsoft Excel:



XLSX 2007

Excel 2007 (.xlsx)



XLS 2003

Excel 2003 (.xls)



XLS 2000

Excel 2000 (.xls)



XLS '97

Excel '97 (.xls)

## 8. The Datasets

- Decennial Census The decennial census is a 100% count of the population taken every ten years. The data represents a snapshot of the nation at a fixed point in time. The number of variables from the 2010 census forward is limited to basic demographic characteristics of the population: race, gender, age, households, family relations, housing units, housing occupancy, and tenure (owner versus renter occupied). The Decennial census from 2000 and back contains most of the data that is now part of the ACS. Decennial census data is available for practically all geographic areas. The most commonly used series in the dataset is Summary File 1 (SF1).

<http://www.census.gov/2010census/>

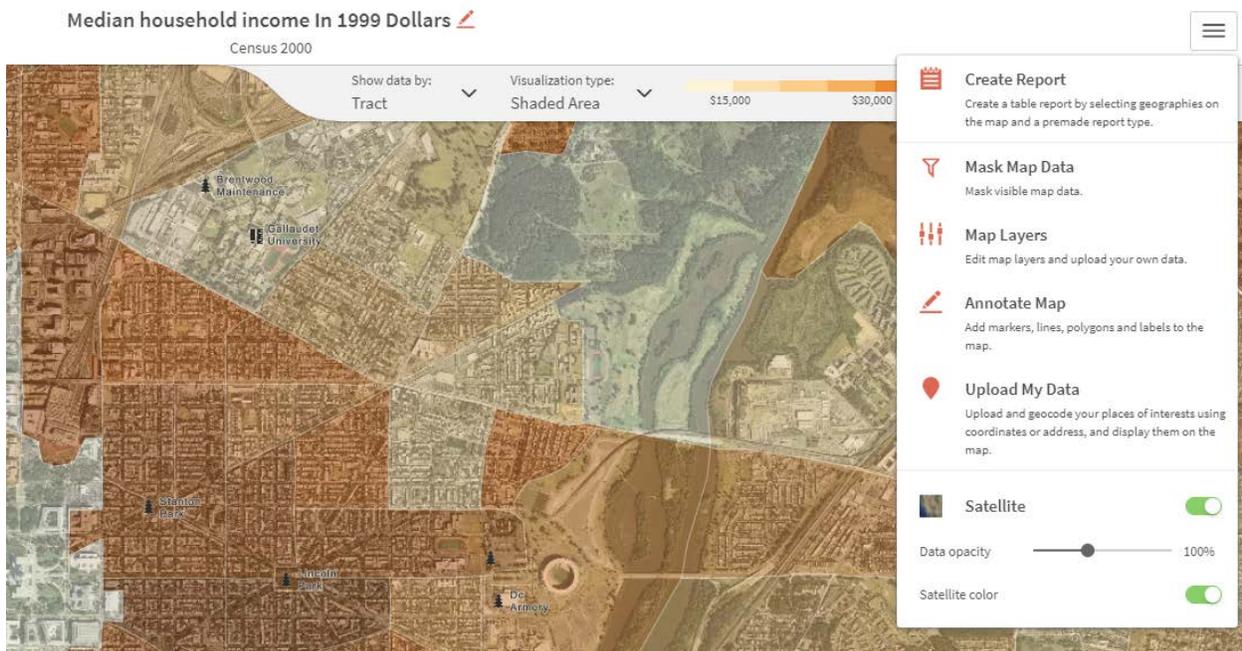
- American Community Survey (ACS) The ACS is a sample survey of the population that is compiled every year. Since it's a survey (based on rolling monthly samples) and not a count, the values represent estimates with a 90% confidence interval and margins of error for 1-year, 3-year, and 5-year periods. The number of variables is more extensive than the decennial census; in addition to basic demographic characteristics the ACS also includes socio-economic data like citizenship, educational attainment, income, occupation, home value, and much more. Geographically the data is more limited; geographic areas with 65k residents or more are published annually, areas with 20k residents or more are published as 3-year averages, and areas with less than 20k residents down to census tracts are published as 5-year averages.

<http://www.census.gov/acs/www/>

## 9. Embedding Satellite Imagery

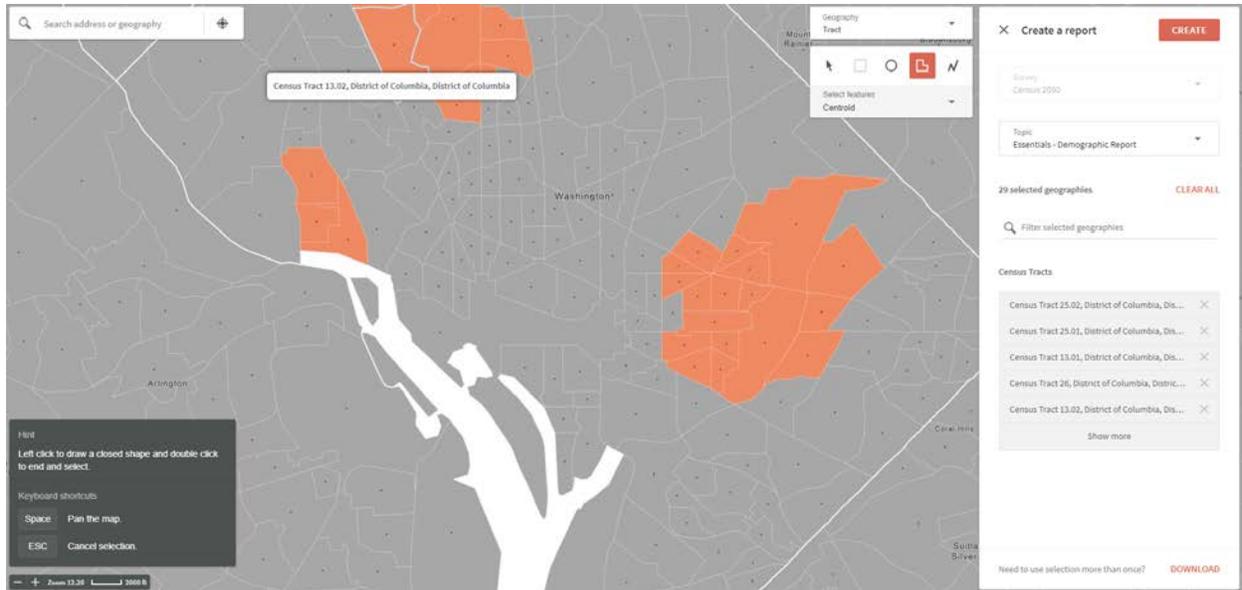
Social explorer allows you to enable satellite view to display the present day satellite imagery of the area you are viewing.

- Go back to the single map layout by clicking the round button in the lower center of the map screen and clicking on single.
- Click on the menu button on the top right corner and turn on the satellite button and you should be able to see the options of data opacity and satellite color.



## 10. Selection Tools

Selection tools are used to custom define geographic areas. To access them click on Menu and then create report and you should see the selection tool options.



Selection modes for the Rectangle, Circle, and Polygon tools now include *Touching*, *Enclosed*, and *Centroid*.

*Touching* mode will select every geography included in the shape, even if a single pixel is included in the shape you draw.

*Enclosed* mode will select only the geographies included in their entirety in the drawn shape. (Even if a single pixel is left outside the shape you draw, the geography will not be included in the selection.)

*Centroid* mode selects features whose geographic centroid falls within your selection. The geographic centroids are also displayed on the map as black dots for each feature so you can clearly see what will be included in your selection when done.

## Credits

This tutorial is based on paper written by Janine Billadello at Baruch College.

## More Training and Information

University of Maryland at College Park students, faculty, and staff have access to free online courses provided by ESRI. These cover a wide range of GIS topics and skills. To gain access to online classes, please contact *kelleyo@umd.edu* with the name of the course you are interested in and your UMD e-mail address to obtain a registration code.

Course list: <https://www.esri.com/training/unlimited-esri-training/>

University of Maryland Libraries' GIS and Spatial Data Services Center website:  
<http://lib.umd.edu/gis/>

University of Maryland Libraries' GIS and Spatial Data Services Center workshop series:  
<https://www.lib.umd.edu/gis/workshops>