Census Mapping with PolicyMap & Social Explorer

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https://libguides.brown.edu/gis_data_tutorials/census

Introduction

This tutorial introduces the basic map making functionality of two US web mapping databases that many libraries subscribe to, and summarizes the different census datasets included in these packages. These databases allow users to easily create thematic maps and generate reports from a large collection of pre-compiled datasets from government and proprietary sources, with a particular emphasis on census data.

PolicyMap : contains a wide array of contemporary data from government and private sources, has good data documentation and a rich base map, includes statistical data and point features, and allows for basic analysis and uploading your own data.

Social Explorer : an archive of historic census data from 1790 to present, plus a smaller selection of other government datasets and modules for other countries, with the ability to create side-by-side and swipe maps for comparisons and to upload your own data.

Brown University users can access these databases from the Library:

- `https://library.brown.edu/`, type the name of the database in the library catalog search engine, then click the relevant "Best Bets" link at the top of the results.
- `https://libguides.brown.edu/az/databases`, browse through or search the A-Z list of databases, and click on the database name.

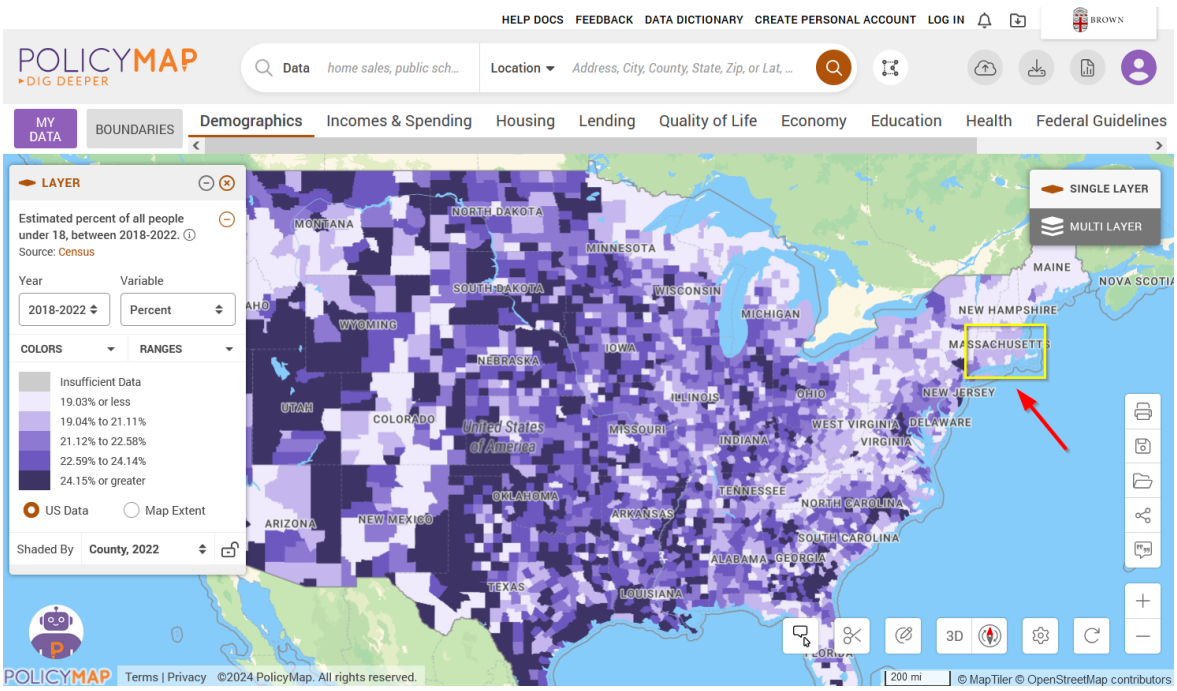
After clicking on the database link, you will be prompted to log in with your Brown University username and password.

You must access these resources through the library! Going directly to the product's website leads to free versions with limited functionality and data. If you're not affiliated with Brown, see if your university library has a subscription; some large public libraries also subscribe.

1 PolicyMap

In this section, we will use PolicyMap to create a map of children relative to public libraries in Providence, RI. Follow the instructions in the **Introduction** to access the database.

1. **Choose a variable**: In the menu bar above the map, choose *Demographics - Age* and choose *Less than 18*. This adds this variable as a layer to the map and creates a visualization. If the extent of your zoom is the entire US, the shaded areas represent counties (note that available geographies will vary based on the underlying data).



2. **Zoom in**: Use your mouse, or the + / - buttons in the lower right hand corner of the map, and zoom into the northeastern area of the US, and more closely to southern New England and Rhode Island. As you zoom in, the geography updates from counties to ZIP Code Tabulation Areas to census tracts.

3. **Note the options in the layer panel**:

   (a) The name of the variable appears at the top, with a link to metadata about the data source.

   (b) Under *Year* you can modify the dropdown from showing the most recent data to earlier iterations.

   (c) Under *Variable* you can opt to show counts or change over time instead of percentages.

   (d) Under *Colors* and *Ranges* you can modify how the data is symbolized.

   (e) The radio buttons *US Data* and *Map Extent* toggle the classification so it's based just on the area you are viewing

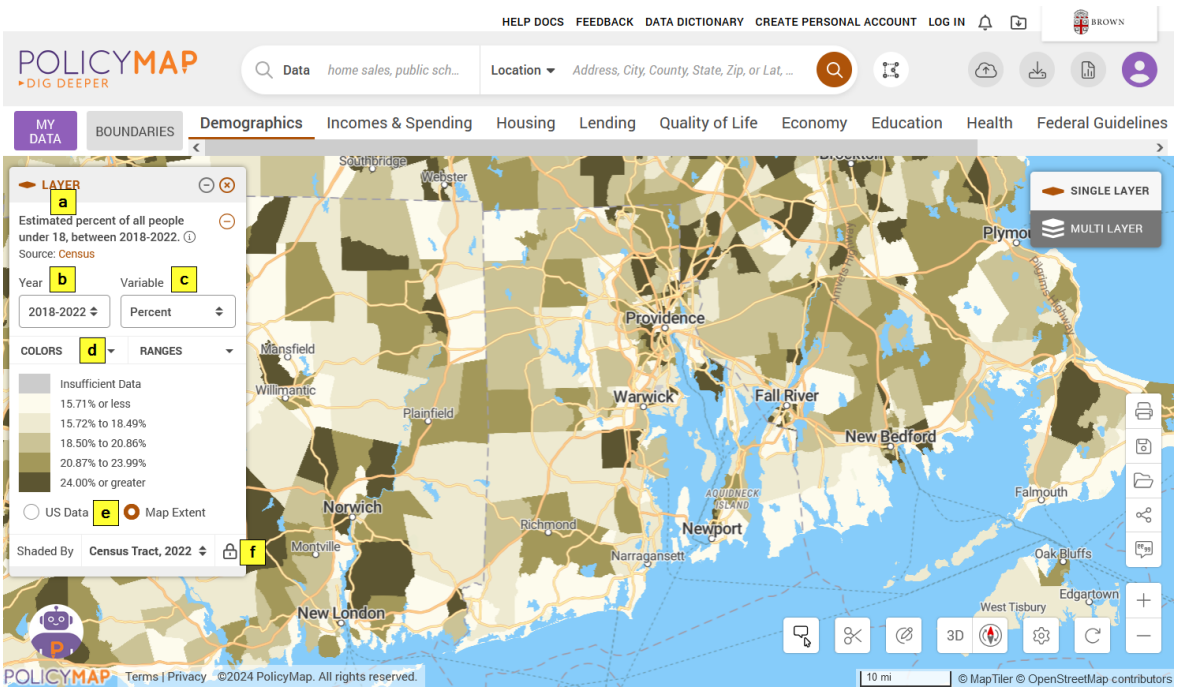
(f) The *Shaded By* dropdown allows you to specify the geographic areas to depict, and the lock button prevents the program from changing the geography as you zoom.

4. **Modify the legend**: Make the following changes in the *Layer* panel:

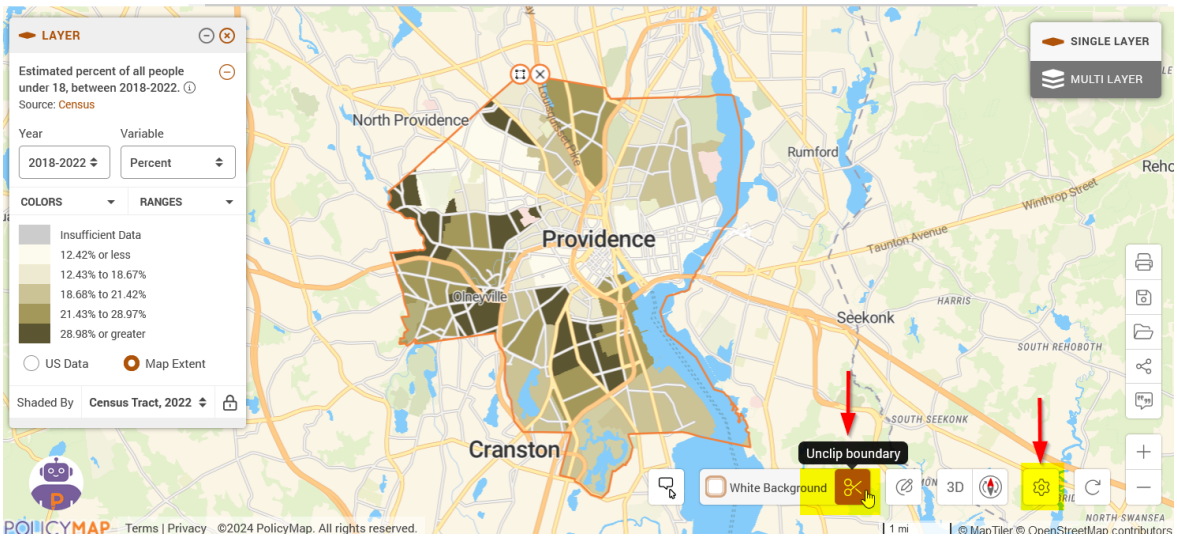
   (a) Choose a different color scheme.

   (b) Toggle the *Map Extent* radio button.

   (c) Under *Shaded By* choose *Census Tract* and hit the lock button.

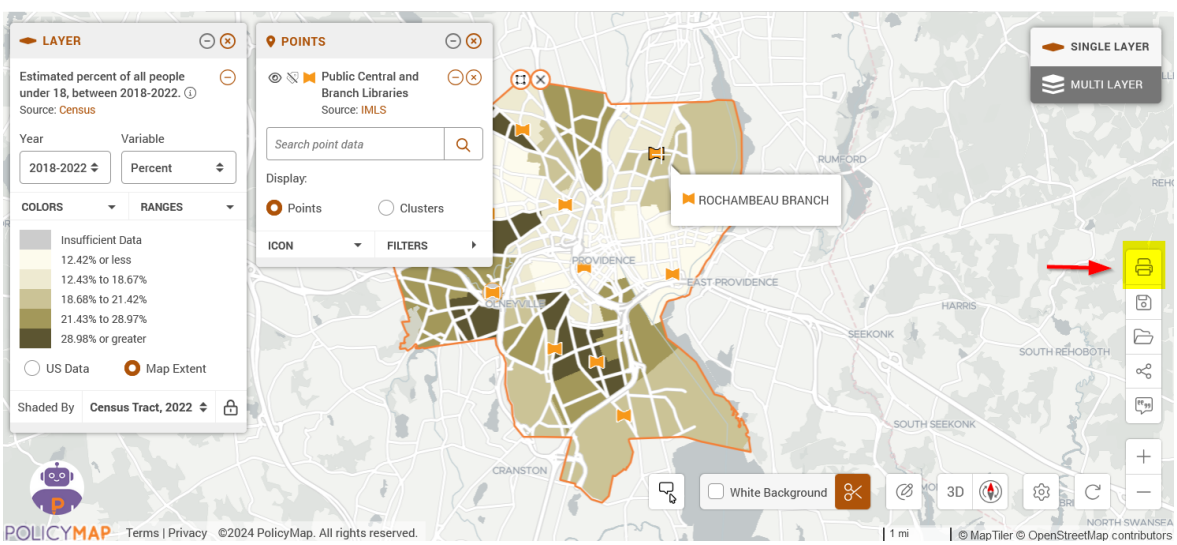


5. **Zoom to city and clip**: in the *Location* search bar, type `Providence, RI`, choose the option for the *City* and hit enter. This high-lights the city in orange. Hit the scissors *Clip Boundary* button in the lower right-hand row of buttons. This clips the map, showing only features within the Providence boundary (checking the white boundary box hides everything outside the clip area).



6. **Modify the base map**: in the same row of buttons, hit the gear wheel *Base Map Settings* button ⚙. Under *Base Map Style* choose the *Light* option. Note that you can turn individual base features like roads and parks on or off.

7. **Add point features to map**: in the menu bar above the map, choose *Quality of Life - Cultural Institutions* and select *Libraries*. This adds a new *Points* panel to the display. You can move the panels around so you can see the map more clearly, and you can modify the icons - select *Icons* and change the *Icon Size* to medium. There is also a *Filters* icon for limiting the libraries by attribute. Clicking on a library will display its attributes.



8. **Export and save your map**: In the buttons on right hand side of screen, hit the *Print* button 🖶. Adjust the zoom on your map so that Providence fits perfectly in the center. You can modify the *Layout* (Portrait or Landscape), the *File Format* (PDF or PNG), and other parameters. Give the map a suitable *Filename*, and hit the *Export* button. Wait for the map to be created, and then download and save it!

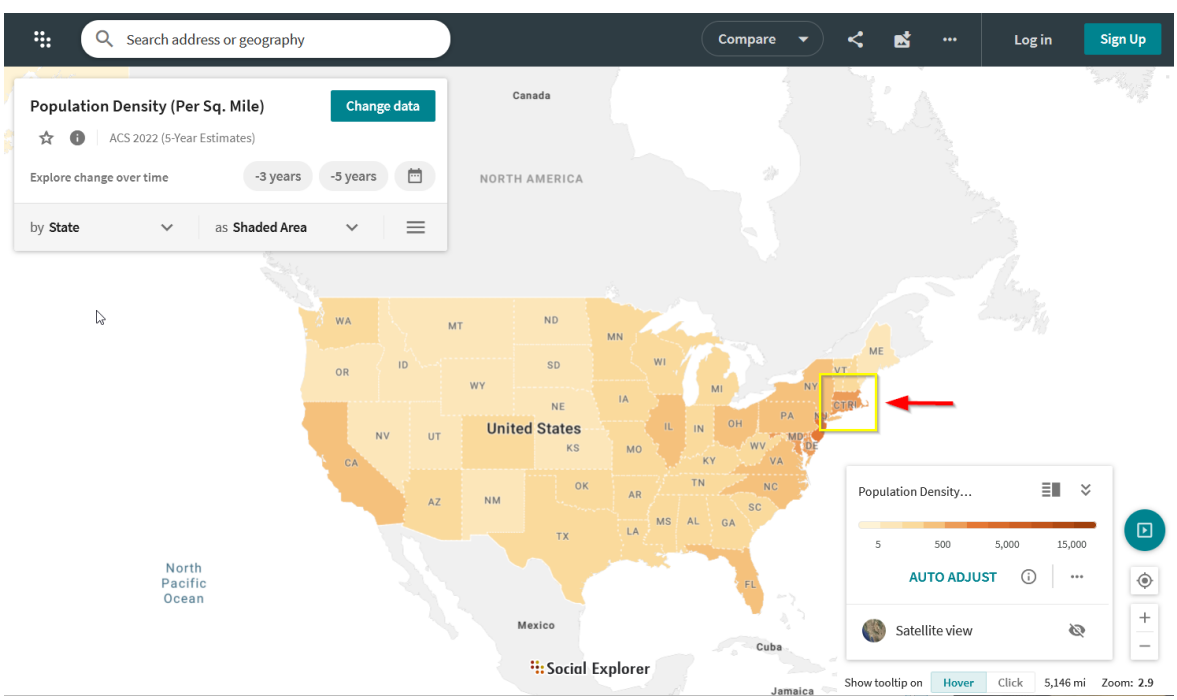
Additional considerations:

- Visit `https://policymap.helpdocs.io/` for additional tutorials on mapping and generating reports.
- Visit the *Data Dictionary* (link in top menu bar) for a list and description of all available datasets.
- You can add custom text to the map with the *Add / Edit Annotations* button .
- If you create a personal account using your university email address, you can save projects and maps (using the *Save* button). This will also allow you to:
  - Upload spreadsheets with coordinate data to plot your own point-based features (cloud button in the top menu bar).
  - Generate a url to share maps, or embed code for inserting them in other websites (*Share* button).

2 Social Explorer

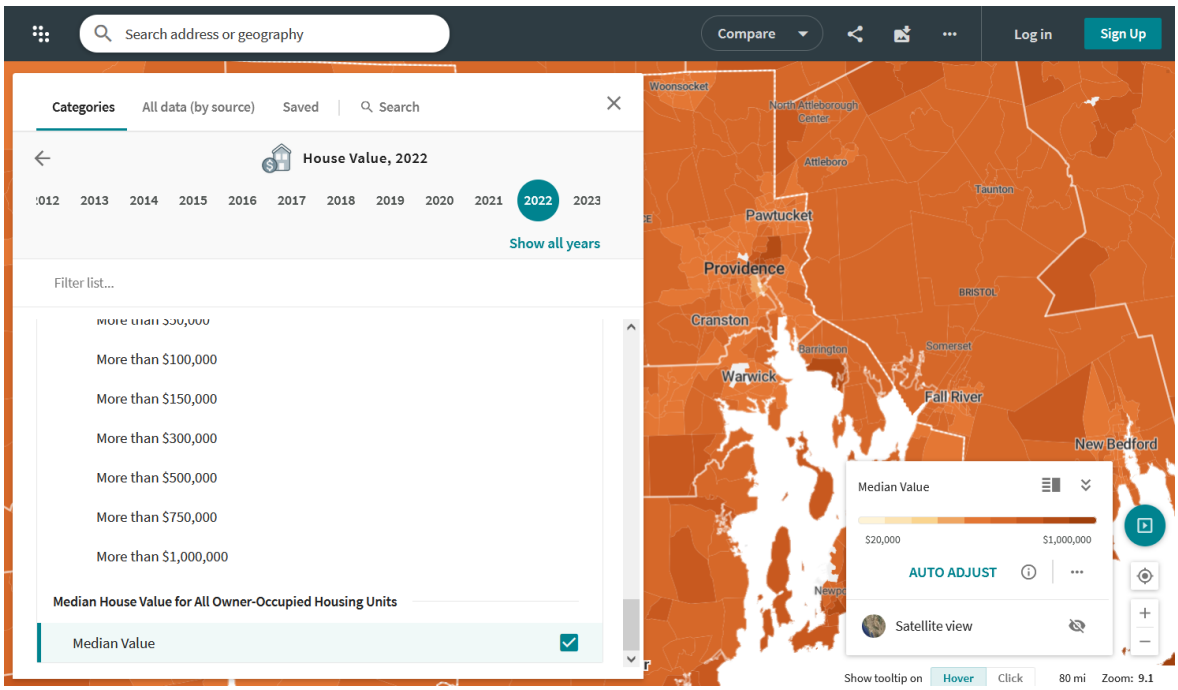
In this section, we will use Social Explorer to create a map the depicts the change in median home values over time in Rhode Island. Follow the instructions in the **Introduction** to access the database.

1. **Launch the database**: click the *Explore* button for the primary *United States* module at the top of the page. You enter the database and are presented with a basic map of population density.



2. **Zoom in**: Use your mouse, or the + / - buttons in the lower right hand corner of the map, and zoom into the northeastern area of the US, and more closely to southern New England and Rhode Island. As you zoom in, the geography updates from counties to census tracts.

3. **Change variable**: In the panel in the upper left hand corner that displays population density (which we'll refer to as the variable panel), hit the *Change Data* button. In the *Categories* menu select *2022*, and *House Value*. Scroll down to the bottom section that covers the *ACS 2022 5-year Estimates*, and under *Median House Value for All Owner-Occupied Units* click *Median Value*. Close the *Category* window.



4. **Note the options in the variable and legend panels**:

   (a) In the upper left-hand corner panel (the variable panel), the name of the variable appears at the top, with a link to basic metadata about the data source, and an option to adjust dollar values for inflation $ if a monetary variable is active.

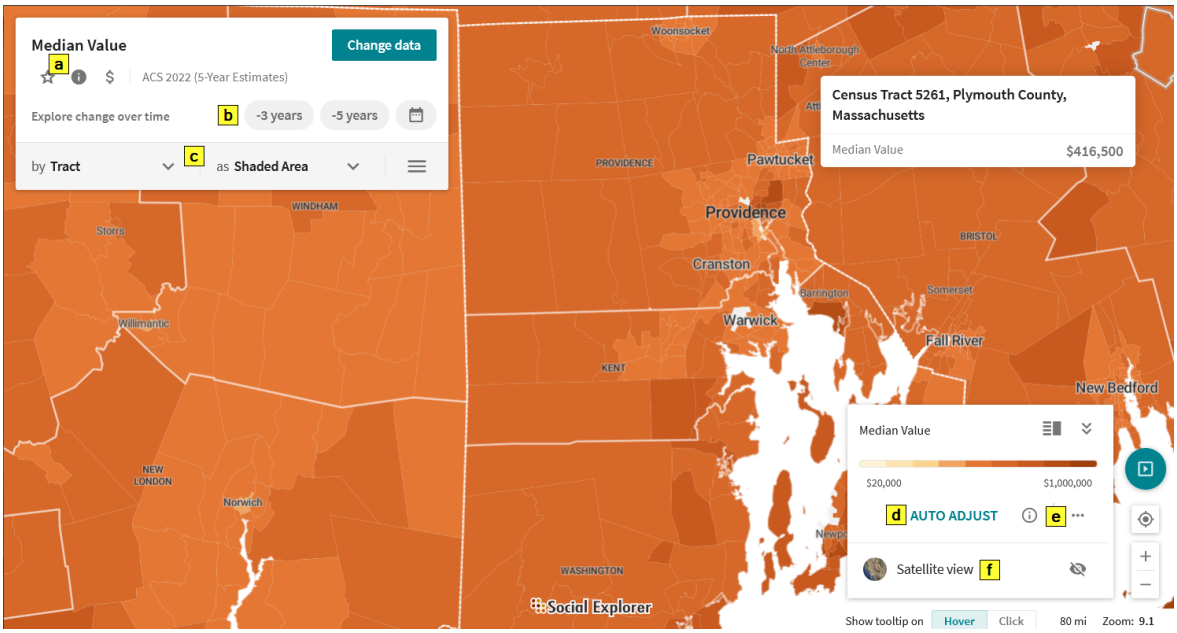
   (b) There is an option to toggle the variable from displaying the current value to showing change over time .

   (c) The hamburger icon opens more options, including adding a mask to the map to hide areas.

   (d) In the panel in the lower right-hand corner (the legend panel), the *Auto Adjust* option modifies the classification scheme based on the visible geography in the map.

   (e) The ellipse button ••• opens additional options, including changing the color scheme and adjusting the data classes.

   (f) The *Satellite View* changes the basemap to display imagery.



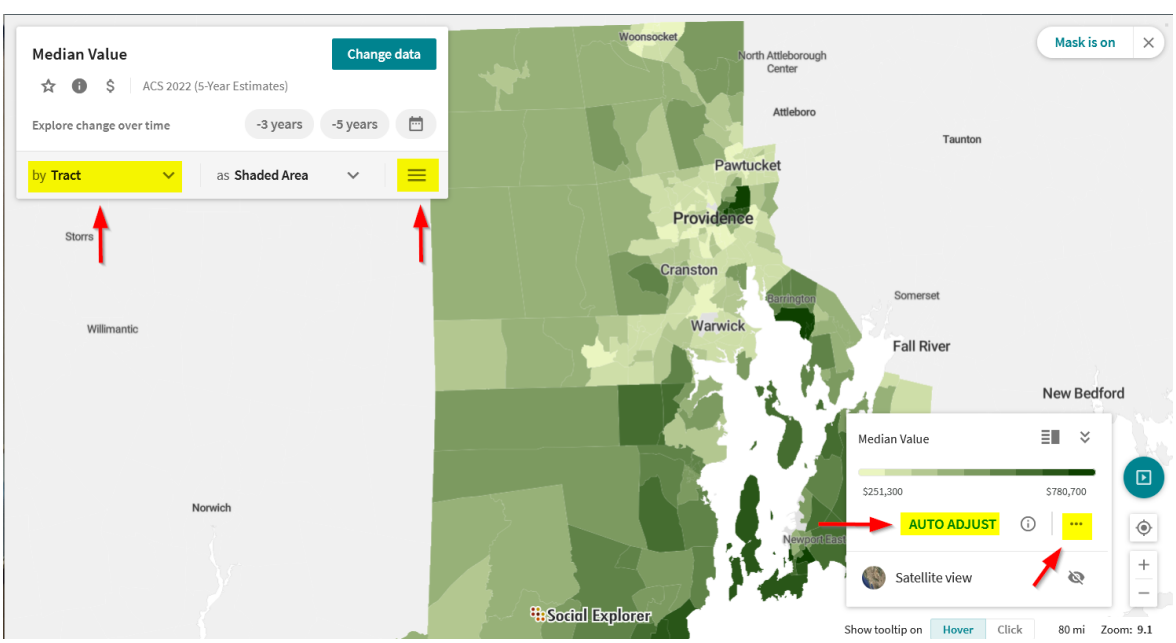
5. **Modify the map**: Make the following changes:

   (a) In the top-left variable panel, hit the geography dropdown that says *by Tract* (or some other geography, based on your zoom) and change the option from *Automatic* to *Census Tract*.

   (b) Hit the hamburger button ☰ and select *Mask map data*. In this menu, change the *Geography* to *State*, and click on Rhode Island in the map. Then hit the *Done* button.

   (c) In the lower-right legend panel, click *Auto Adjust* to modify the classification based on the map view.

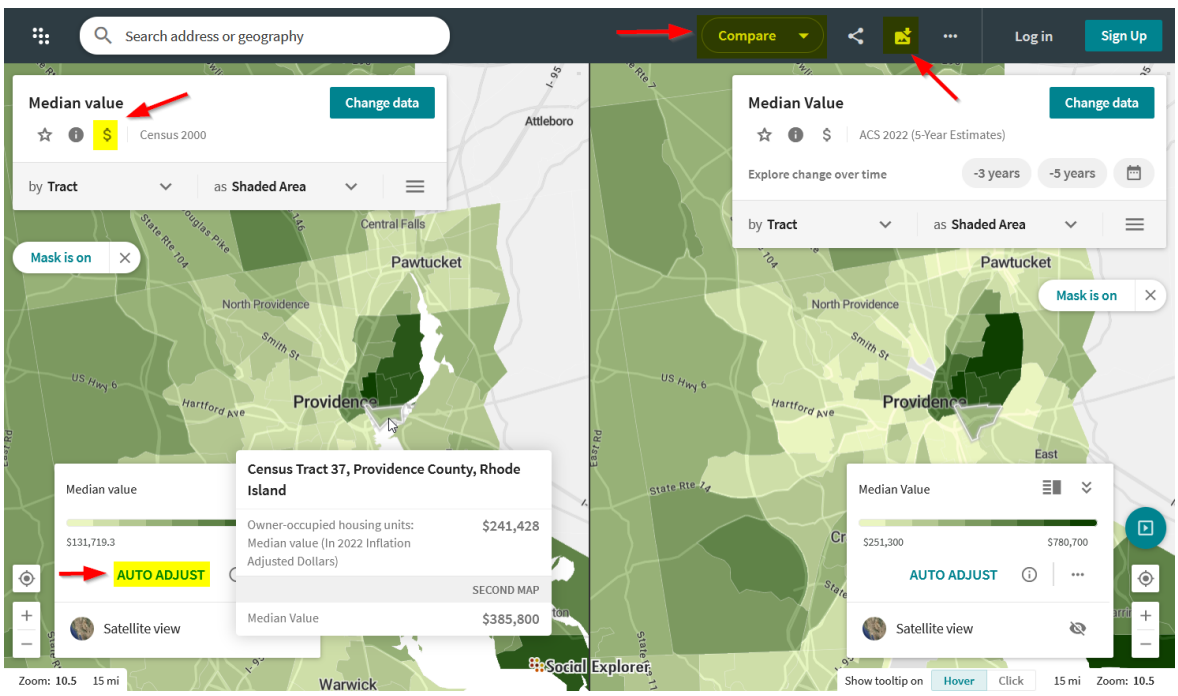
   (d) Hit the ellipse button ••• and change the color scheme.



6. **Make a comparison map**: in the dark menu bar above the map, hit the *Compare* dropdown and choose *Side by Side* option. This creates a duplicate of your map.

7. **Modify the left map**: in the map on the left, hit the *Change Data* button. Under the *House Value* category, click the link to *Show all years* select the year *2000* circle at the top. Under *Census 2000*, *Median House Value for All Owner-Occupied Units* select *Median value*. Close the *Category* menu. Hit the dollar sign button in the variable panel, and under *CPI Correction* $, select *2022* as the dollar year. Hit *Done*. Lastly, hit *Auto Adjust* on the legend panel.

8. **Explore**: zoom in to the map on the left, and the map on the right will match the zoom and extent. Hover over a census tract, and you can see how the value has changed over time.



9. **Save and export your map**: in the dark bar above the map, hit the *Export as image* button  . Unfortunately you can only export one map at a time. Choose the right map. Adjust the zoom and aspect ratio. At the bottom select *Format* and choose *PNG image*. Hit *Export*, and wait for the map to be generated and downloaded. A title (based on the variable) and legend will be automatically added.

<u>Additional considerations</u>:

- Visit `https://help.socialexplorer.com/` for additional tutorials on mapping and generating reports.
- When making comparison maps, you may want to adjust the classification schemes so that the breakpoints match.

- Census geography changes over time. On the initial landing page, you can opt to use the *U.S. Decennial Censuses on 2010 Geographies* module instead of the standard one, where a limited amount of data has been adjusted to fit into one set of boundaries.
- If you create a personal account using your university email address, you can save projects and maps (using the *Save* button). This will also allow you to:
  - Upload CSV files with coordinate data to plot your own point-based features (under the options menu on the variable panel).
  - Generate a url to share maps, or embed code for inserting them in other websites (using the *Share* button on the dark toolbar).

3 Information About the Census

PolicyMap and the Social Explorer incorporate an extensive amount of census data, primarily from the American Community Survey (ACS) and the decennial census. The ACS captures detailed socio-economic characteristics of the population from the year 2005 forward, while the decennial census focuses just on basic demographic data from the 2010 census forward. Prior to the introduction of the ACS, the decennial census from 2000 backward captured most of the detailed characteristics included in the ACS. Census questions, categories, and geographies change over time.

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. Variables from the 2010 census forward are limited to basic demographic and housing characteristics: race, sex, age, households, family relations, housing units, housing occupancy, and tenure (owner versus renter occupied).

American Community Survey (ACS)

The ACS is a sample survey of the population that's 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 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, and areas with less than 65k residents down to census block groups are published as 5-year averages. New data is published near the end of each year.

Geography in Brief

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 5-year ACS.

County : the legal and administrative subdivisions of states; there are over 3,000 counties in the US. Available in the decennial census and the ACS (partial 1-year, fully 5-year).

County Subdivision : legal subdivisions of counties (municipal civil divisions or MCDs) in states that have them, and areas created by the Census Bureau (Census County Divisions or CCDs) in states that don't. Available in the decennial census and 5-year ACS.

Metropolitan Area : a concentrated, urban population center surrounded by adjacent areas that have a high degree of social and economic interaction with that center, created by aggregating counties. Available in the decennial census and the ACS.

Place : a concentrated settlement of people. Places include legally incorporated cities and towns, as well as unincorporated statistical areas delineated by the Census Bureau (CDPs). Available in the decennial census and the ACS (partial 1-year, fully 5-year).

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 the ACS.

ZCTA : ZIP Code Tabulation Area - the Census Bureau's approximation of USPS ZIP Code delivery areas, created by aggregating census blocks. ZCTAs may cross any boundary, including state boundaries. Available in the decennial census and 5-year ACS.