

Mapping Poverty Rates

For this hands-on exercise, we'll map poverty rates in California by county.

Poverty Rates

First, let's level up on how the government measures [poverty](#). It's a complicated endeavor, to say the least...

- Crash course in measuring poverty, courtesy of the [West Wing](#)
- [NYT: U.S. Recovery Eludes Many Living Below Poverty Level, Census suggests](#)
- [Income and Poverty in the United States: 2017](#)

Acquiring Census Poverty Data

Finding County Poverty Data

- Go To [American FactFinder](#)
- Select `Advanced Search` -> `Show Me All`

First, we'll add the Geographic component to our data:

- Choose `Geographies` and select the below options:
 - Select a geographic type: `County - 050`
 - Select a state: `California`
 - Select one or more geographic areas...: `All Counties within California`
- Click `Add to your selections`

Search - Use the options on the left (topics, geographies, ...) to narrow your search results

Your Selections

'Your Selections' is empty

[load search](#) | [save search](#)

Search using the options below:

Topics
(age, income, year, dataset, ...)

Geographies
(states, counties, places, ...)

Race and Ethnic Groups
(race, ancestry, tribe)

Industry Codes
(NAICS industry, ...)

EEO Occupation Codes
(executives, analysts, ...)

To search for tables and other files in American FactFinder:

Enter search terms and an optional geography and click **GO**

Select Geographies

ListNameAddressMap

Select geographies to add to Your Selections ?

Select from: ☒ most requested geographic types ☐ all geographic types

Select a geographic type:
..... County - 050

Select a state:
California

Select one or more geographic areas and click **Add to Your Selections**:

All Counties within California
Statewide, California; California
Alameda County, California
Alpine County, California
Amador County, California
Butte County, California
Calaveras County, California
Colusa County, California
Contra Costa County, California
Del Norte County, California

ADD TO YOUR SELECTIONS **ABOUT THIS GEOGRAPHY**

Didn't find your geographic type? Click the 'all geographic types' radio button above, or try the Na

Next, we'll add the poverty data for counties:

- Choose **Topics**
- Then drill down to **People** -> **Poverty** and click on **Poverty**
- Then click the **CLOSE X** button in the **Topics** pop-up

Search - Use the options on the left (topics, geographies, ...) to narrow your search

Your Selections

Search using...
County
All Counties within California ✕

[clear all selections and start a new search](#)

[load search](#) | [save search](#)

Search using the options below:
Topics
(age, income, year, dataset, ...)

Geographies
(states, counties, places, ...)

Race and Ethnic Groups
(race, ancestry, tribe)

Industry Codes
(NAICS industry, ...)

EEO Occupation Codes
(executives, analysts, ...)

Search Results: 1-25 of 37,538 tables and other products match 'Your Selections'

Select Topics CLOSE ✕

Select Topics to add to 'Your Selections' ?

- + Education
- + Employment
- + Income & Earnings
- + Insurance Coverage
- + Language
- + Marital & Fertility Status
- + Origins
- + Population Change
- Poverty
 - [Food Stamps/SNAP](#) (616)
 - [Heating and Cooling Assistance](#) (140)
 - [Poverty](#) (3,330)
- + Relationship
- + Veterans
- + Housing
- + Business and Industry
- + Year
- + Product Type
- + Program
- + Dataset

Note: The **Race & Ethnicity** topic is available under the **Race and Ethnic Groups** button on the left.

☐ Include archived products in your search ?

You should now have a filtered list of data sets. Select the file called

S1701 POVERTY STATUS IN THE PAST 12 MONTHS from the 2016 ACS 5-year estimate.

1 Selected:  View |  Download |  Compare |  Clear All |  Reset Sort 

★ - Suggested search results for **Poverty**

	ID	Table, File or Document Title
<input type="checkbox"/>	DP03	★ SELECTED ECONOMIC CHARACTERISTICS
<input checked="" type="checkbox"/>	S1701	★ POVERTY STATUS IN THE PAST 12 MONTHS
<input type="checkbox"/>	S1702	★ POVERTY STATUS IN THE PAST 12 MONTHS OF FAMILIES
<input type="checkbox"/>	S1703	★ SELECTED CHARACTERISTICS OF PEOPLE AT SPECIFIED LEVELS OF POVERTY IN THE PAST 12 MONTHS

Note, we're using this file because 5-year estimates are generally more accurate and this includes data for all 58 CA counties, whereas the most recent 2017 1-year estimate only contains data for 40 counties.

Pre-filtering the Census data

Before we download this table, let's use the FactFinder wizard to make it easier to work with downstream.

Select the **Modify Table** button above the table.

Once that's done:

- Collapse all the subgroups under the various demographic groupings such as AGE, EDUCATIONAL ATTAINMENT, etc.
- In the leftmost column header (**Subject**):
 - Click the top filter and select **HC03** to limit the results to the Percent below poverty level

1 - 18 of 240 >>

Subject	Alameda County, California						Butte C	
	Total		Below poverty level		Percent below poverty level		Total	Be
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Population for whom poverty status is determined	1,636,780	+/-2,648	150,895	+/-8,692	9.2%	+/-0.5	222,834	+/-1,998
AGE								
+ Under 18 years	3							
+ 18 to 64 years	1,0							
60 years and over	3							
65 years and over	2							
SEX								
Male	8							
Female	8							
RACE AND HISPANIC OR LATINO ORIGIN								
White alone	6							
Black or African American alone	1							
American Indian and Alaska Native alone								
Asian alone	495,553	+/-5,959	36,213	+/-4,788	7.3%	+/-1.0	11,847	+/-1,327

Filter Dimension

Display Columns where ?

Boxhead

is one of the following

	Code	Meaning
<input type="checkbox"/>	HC01	Total
<input type="checkbox"/>	HC02	Below poverty level
<input checked="" type="checkbox"/>	HC03	Percent below poverty level

OK CANCEL

- Click the bottom filter and select **EST** only

Subject	Alameda County, California		Butte County, California		Contra Costa County, California		El Dorado County, California	
	Percent below poverty level		Percent below poverty level		Percent below poverty level		Percent below poverty level	
	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error	Estimate	Margin of Error
Population for whom poverty status is determined	9.2%	+/-0.5	18.3%	+/-2.0	9.3%	+/-0.9	8.2%	+/-1.9
AGE								
+ Under 18 years								
+ 18 to 64 years								
60 years and over								
65 years and over								
SEX								
Male								
Female								
RACE AND HISPANIC OR LATINO ORIGIN								
White alone								
Black or African American alone	20.8%	+/-2.4	N	N	18.9%	+/-5.1	N	N

Filter Dimension

Display Columns where ?

Estimate

is one of the following

	Code	Meaning
<input checked="" type="checkbox"/>	EST	Estimate
<input type="checkbox"/>	MOE	Margin of Error

OK CANCEL

Download/unpack the data

Next, click **Download** , select **Use the data to...** and click OK.

Download

I want to download the data to ... ?

☒

Use the data (e.g., in a spreadsheet or database)

The following content options are available for this Comma-Separated Value (.csv) download:

☒

 Merge the annotations and data into a single file?

☒

 Include descriptive data element names?

☐

View the data (e.g., as a presentable document)

OK

CANCEL

Once the zipfile is generated, download it.

Next, fire up the Terminal and execute the following commands:

```
# Create a new directory for the data
mkdir -p ~/Desktop/poverty_map
cd ~/Desktop/poverty_map

# Move and unpack the Census zipfile
# NOTE THE DOT at the end of the next line!!
mv ~/Downloads/ACS_16_5YR_S1701.zip .
unzip ACS_16_5YR_S1701.zip
```

After following the above steps, you should see several files in the `poverty_map` folder. Next, we'll perform a few more manual cleanups on the Census data as preparation for import into Google Fusion Tables.

Prepping the data

Let's use Excel to open our main data file (`ACS_16_5YR_S1701_with_ann.csv`) and remove extraneous columns and header rows.

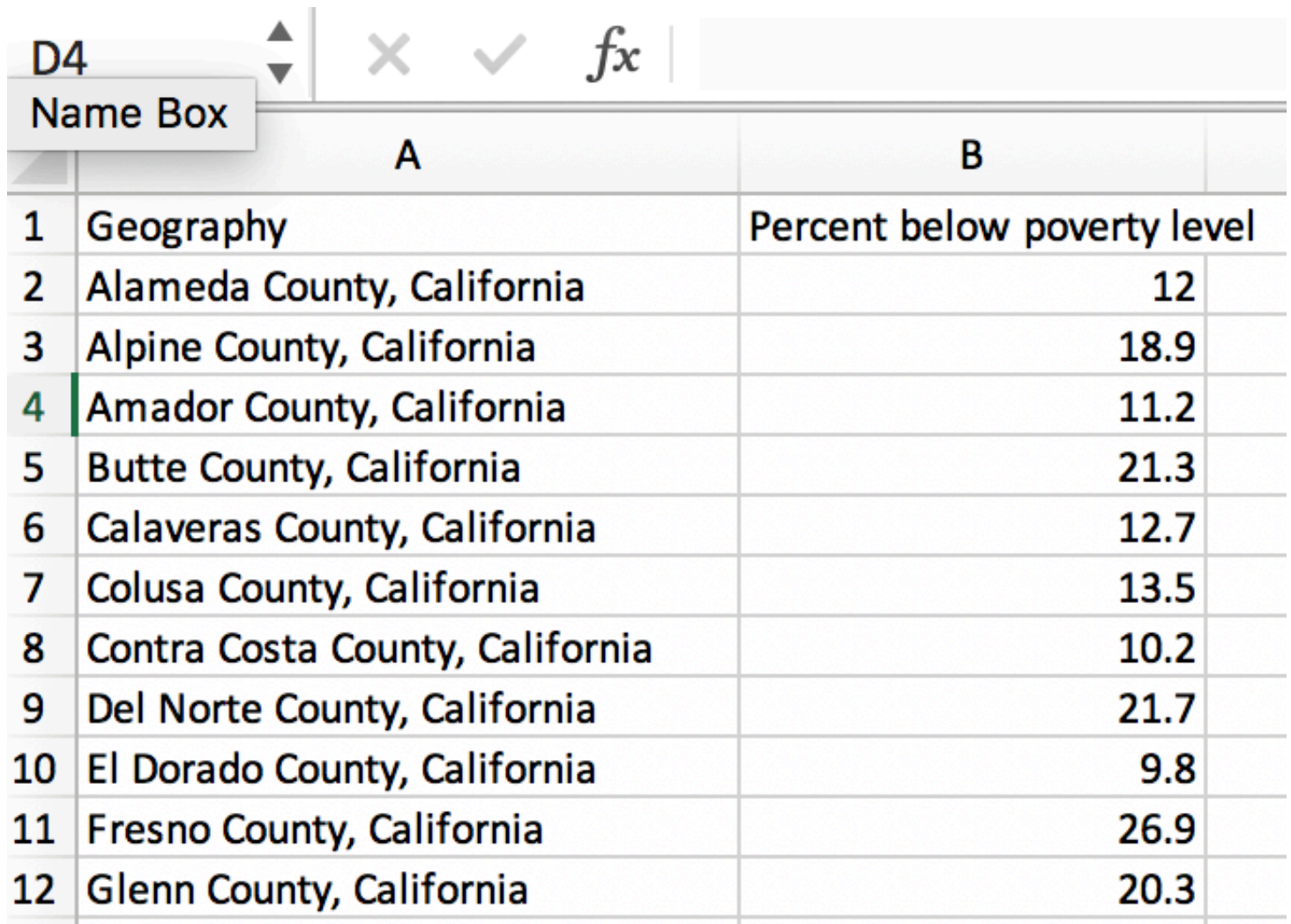
- Once the file is open, delete the first header row.
- Next, delete the `id` and `id2` columns at the far left.
- Now delete all columns from `C` through to the end.

Select column C and then hit SHIFT + COMMAND + right arrow to quickly select the range of columns through the end.

Let's also simplify the name of the second column to `Percent below poverty level`.

Finally, click `File -> Save As` and save the edits to a new file called `ca_poverty_by_county.csv`.

You should now have a table that looks like this:



	A	B
1	Geography	Percent below poverty level
2	Alameda County, California	12
3	Alpine County, California	18.9
4	Amador County, California	11.2
5	Butte County, California	21.3
6	Calaveras County, California	12.7
7	Colusa County, California	13.5
8	Contra Costa County, California	10.2
9	Del Norte County, California	21.7
10	El Dorado County, California	9.8
11	Fresno County, California	26.9
12	Glenn County, California	20.3

Fusion tables

Google Fusion Tables is a useful and relatively simple tool for generating thematic maps. It offers a number of features that will let us [merge](#) our Census poverty data with county boundaries for California.

Import data to a Google Fusion Table

- Open up your Google Drive folder.
- Click the **New** button and select the **More** dropdown menu.
- Select **Google Fusion Tables**

If you don't see an option for **Google Fusion Tables**, click **Connect more apps** and search for and enable it.

The screenshot shows the Google Drive web interface. At the top left is the Drive logo. To its right is a search bar labeled 'Search Drive'. Below the logo is a 'My Drive' dropdown menu. The 'New' button is highlighted, and its dropdown menu is open, showing options: Folder, File upload, Folder upload, Google Docs, Google Sheets, Google Slides, and More. The 'More' option is selected, opening a secondary menu that lists various Google apps: Google Forms, Google Drawings, Google My Maps, Google Sites, Google Fusion Tables, Mindmap, MindMeister, and a 'Connect more apps' button at the bottom. In the background, a file named 'Assignment 9: SQL JOINS' is visible, containing a table with election data.

date	work_descrp	start_time	end_time	total
9/11/2019	NAB primary debate	1:00 PM	2:00 PM	1.7
9/23/2019	Protesters march on R	7:10 PM	10:40 PM	2.5
9/28/2019	Ria's custom race	1:30 PM	4:00 PM	2.0
9/28/2019	Ria's govt confg mtg	7:30 PM	9:00 PM	1.5
10/1/2019	Condo and coop	9:45 AM	10:15 AM	1.5
10/3/2019	First pen outcome	9:30 PM	9:30 PM	3
10/11/2019	Prep for test and	9:00 AM	9:00 AM	1
10/13/2019	Catal review mtg	9:00 AM	10:00 AM	0.5
10/29/2019	Shelter recovery	11:00 AM	12:00 PM	1
10/30/2019	Cashierhand date	9:00 AM	10:00 AM	2
11/2/2019	Customer testing	9:45 AM	11:45 AM	2
11/2/2019	Trial allocation of	7:00 PM	8:00 PM	1
11/9/2019	Pres election date	1:00 AM	12:30 AM	1.8
11/9/2019	Reaction day	3:00 PM	12:00 AM	9

In the **Import new table** wizard:

- Click `Choose File`
- Select the file that we prepared earlier (`ca_poverty_by_county.csv`)

Import new table

From this computer

Google Spreadsheets

Create empty table

`Choose File` `ca_poverty_by_county`

Separator character ☒ Comma ☐ Tab ☐ Colon ☐ Other

Character encoding `UTF-8`

You can upload spreadsheets, delimited text files (.csv, .tsv, or .txt), and Keyhole Markup Language files (.kml) [Learn more](#)

Or search public data tables

New to Fusion Tables?

Take a peek! [Play with a data set](#) or [try a tutorial](#).

Cancel

« Back

Next »

- Click `Next`
- Click `Next` when you see the import preview
- Click `Finish` on the metadata section of wizard

The data should have imported into Fusion Tables.

Next, we'll merge this data with county boundaries and map the poverty levels.

Fusion tables public data

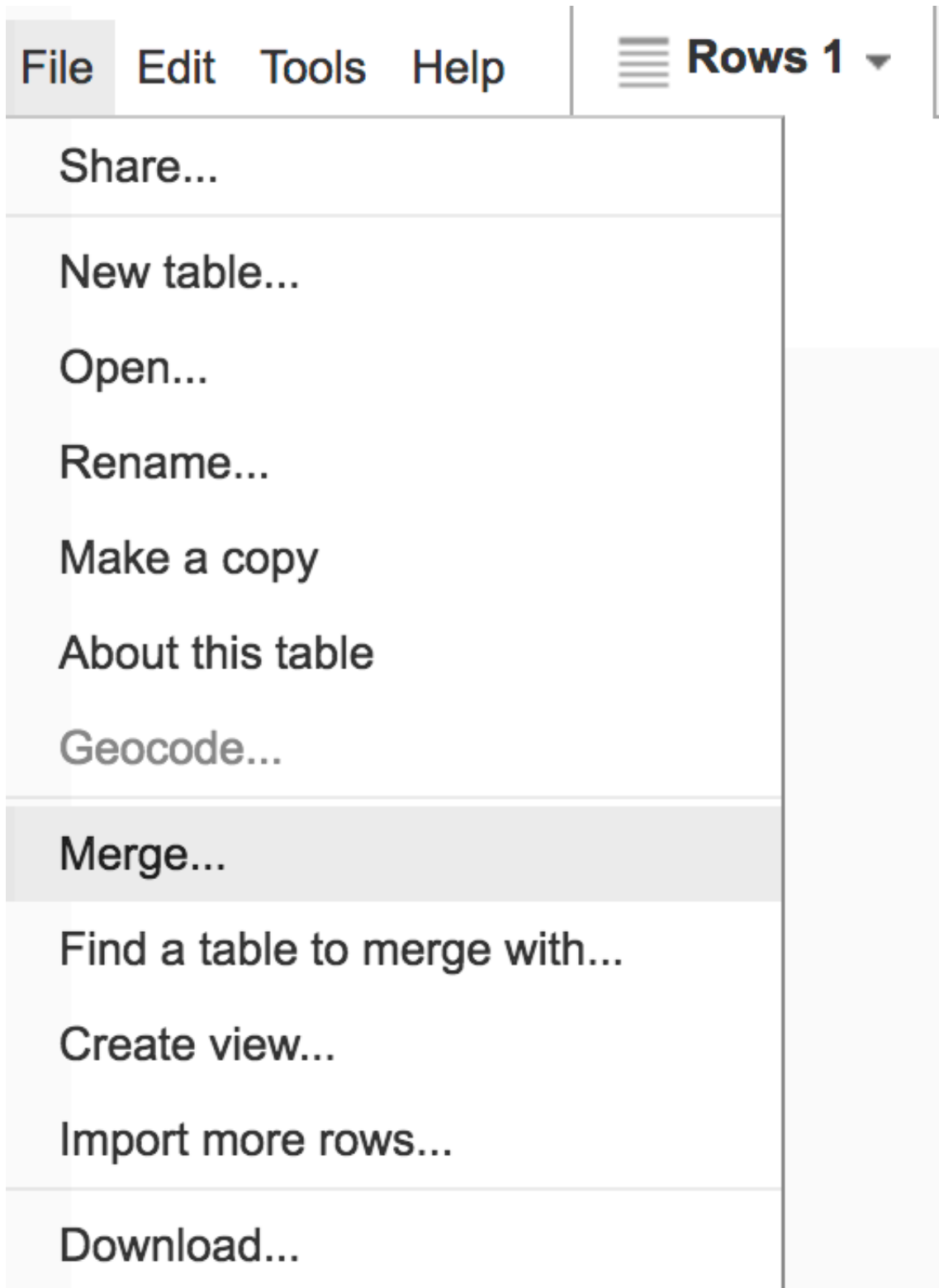
Google Fusion has a number of pre-generated [public use data tables](#) that can help with mapping, including state, congressional district and county boundaries.

We'll use the [California Counties Fusion table/map](#).

Generating this file on our own would require working with the raw [Census Cartographic Boundary](#) files, which are in a format known as Keyhole Markup Language (KML)

In order to map our poverty rates, we'll need to merge our data by county name with the CA boundaries table provided by Google Fusion:

- Click `File -> Merge...`



A merge wizard should pop up. Paste the link to the [California Counties Fusion table/map](#) in the bottom of window where it says and click :

Merge: Select a table



Tables



Name

Owner

Last modified ↓



Merge of ca_poverty_by_county and Copy of California Counties

me

2:41 PM



Merge of ca_poverty_by_county and Copy of California Counties

me

2:40 PM



ca_poverty_by_county

me

2:38 PM



Merge of Copy of ca_poverty_by_county2 and Copy of California Counti...

me

2:36 PM

Or paste a web address here:

Next

Cancel

In the next wizard screen, select the fields on which to merge the tables. Choose **Geography** for the poverty table and **Geographic Name** as the field for the California Counties table.



Merge: Confirm source of match

This table

Geography ▼

Alameda County, California
Alpine County, California
Amador County, California
Butte County, California
Calaveras County, California
Colusa County, California
Contra Costa County, California
Del Norte County, California
El Dorado County, California
Fresno County, California

California Counties

Geographic Name ▼

Alameda County, California
Alpine County, California
Amador County, California
Butte County, California
Calaveras County, California
Colusa County, California
Contra Costa County, California
Del Norte County, California
El Dorado County, California
Fresno County, California

Matching values in these two columns will create the merged table. [Learn more](#)

Cancel

Previous

Next

You should see a data preview that shows identical values in both columns. If everything looks good, click **Next** and then click **Merge**.

If the merge fails

If the above merge process fails with an error such as this...

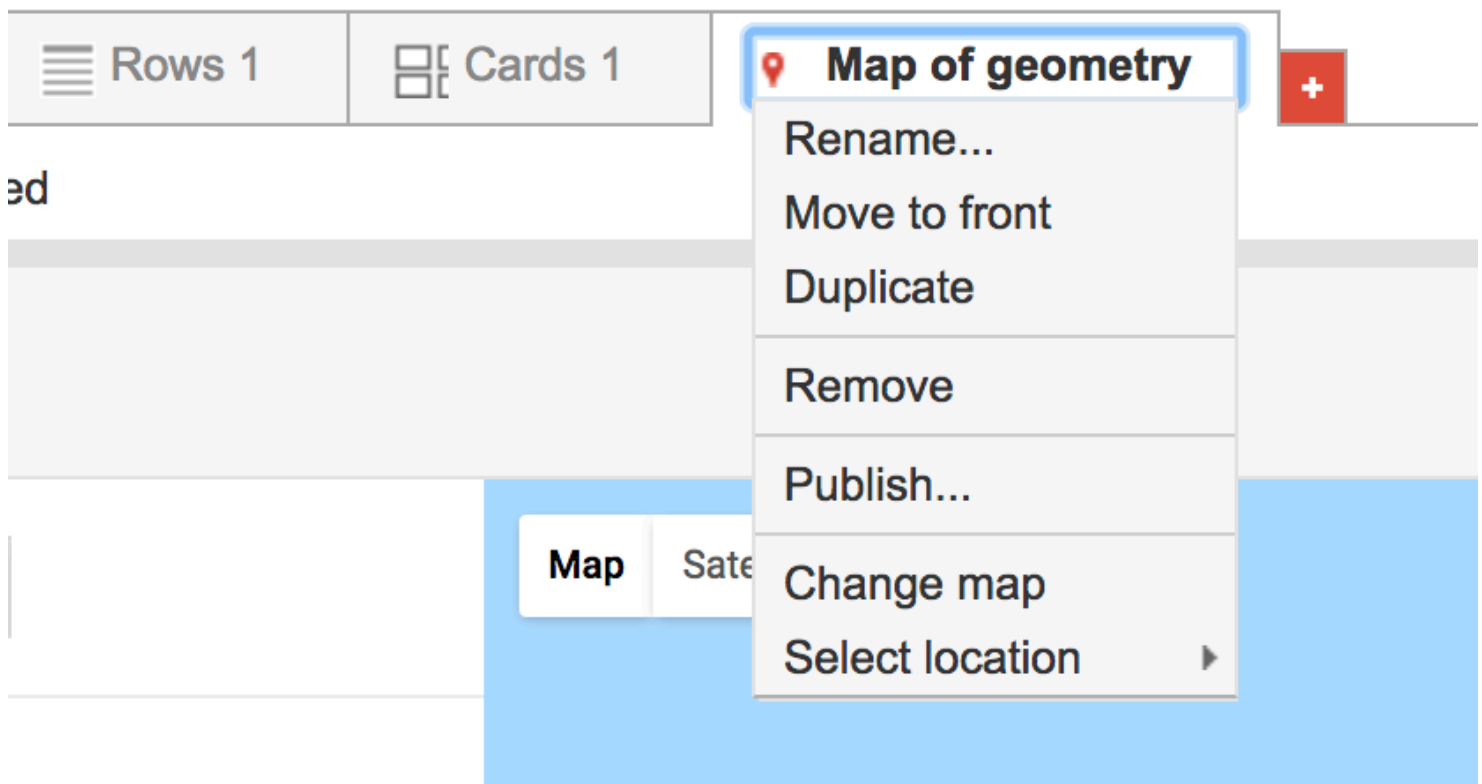
⚠ Unable to perform the merge. Please try again

...you should make a copy of the CA counties table and repeat the merge steps above. This time, however, you should supply the URL to your new copy of the CA Counties table. This is an admittedly annoying but widely recommended work-around for this error.

Styling the map

Once you've merged the tables, we'll want to shade the counties based on their poverty levels.

To do so, click through to the new table and click the "Map of geometry" tab. Select the drop-down menu in the corner of the tab and click `Change Map` to call up the map configuration menu.



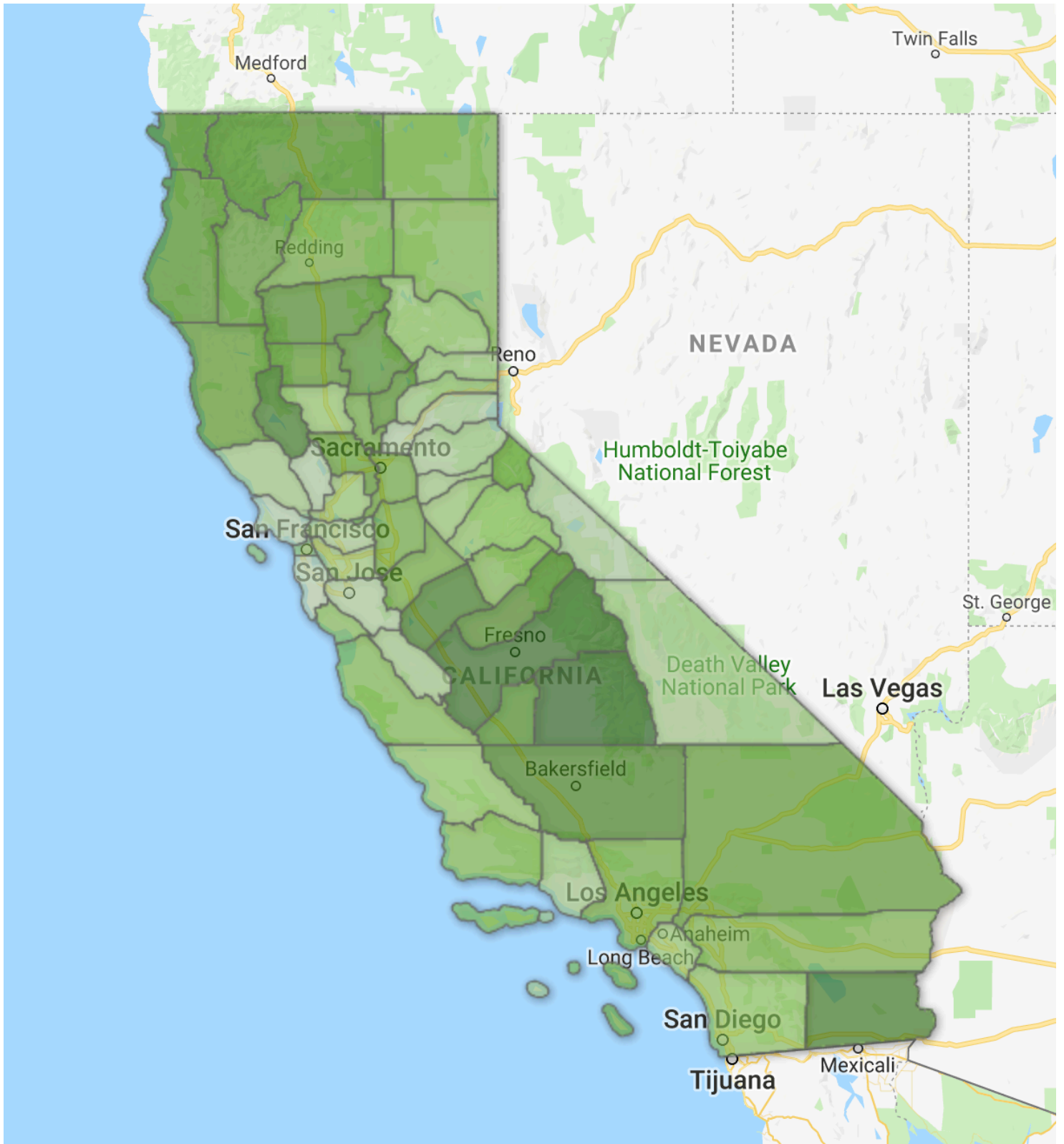
Under "Feature map", click `Change feature styles` and do the following:

- Click "Fill color" under "Polgyons"
- Click the "Gradient" tab
- Select "Show a Gradient"

- ×

×

After you click save, the map should re-render using the gradient you just configured.



Clean up the info window

We should also clean up the details in the pop-up windows for all the counties.

In the map configuration area, click "Change info window".

In the Automatic tab, uncheck everything except for **Geography** and **Percent below poverty level**.

Change info window layout

AutomaticCustom

Select the columns to include in your map's info window.

☒ county

☐ Geography

☒ Percent below poverty level

☐ State-County

☐ state abbr

☐ State Abbr.

☐ geometry

☐ value

☐ GEO_ID

☐ GEO_ID2

☐ Geographic Name

☐ STATE num

☐ COUNTY num

☐ FIPS formula

☐ Has error

```
<div class='googft-info-window'>
<b>county:</b> {county}<br>
<b>Percent below poverty level:</b> {Percent below poverty level}
</div>
```

Save

Cancel

Next, head over to the Custom tab and change the "Geography" label to "County".

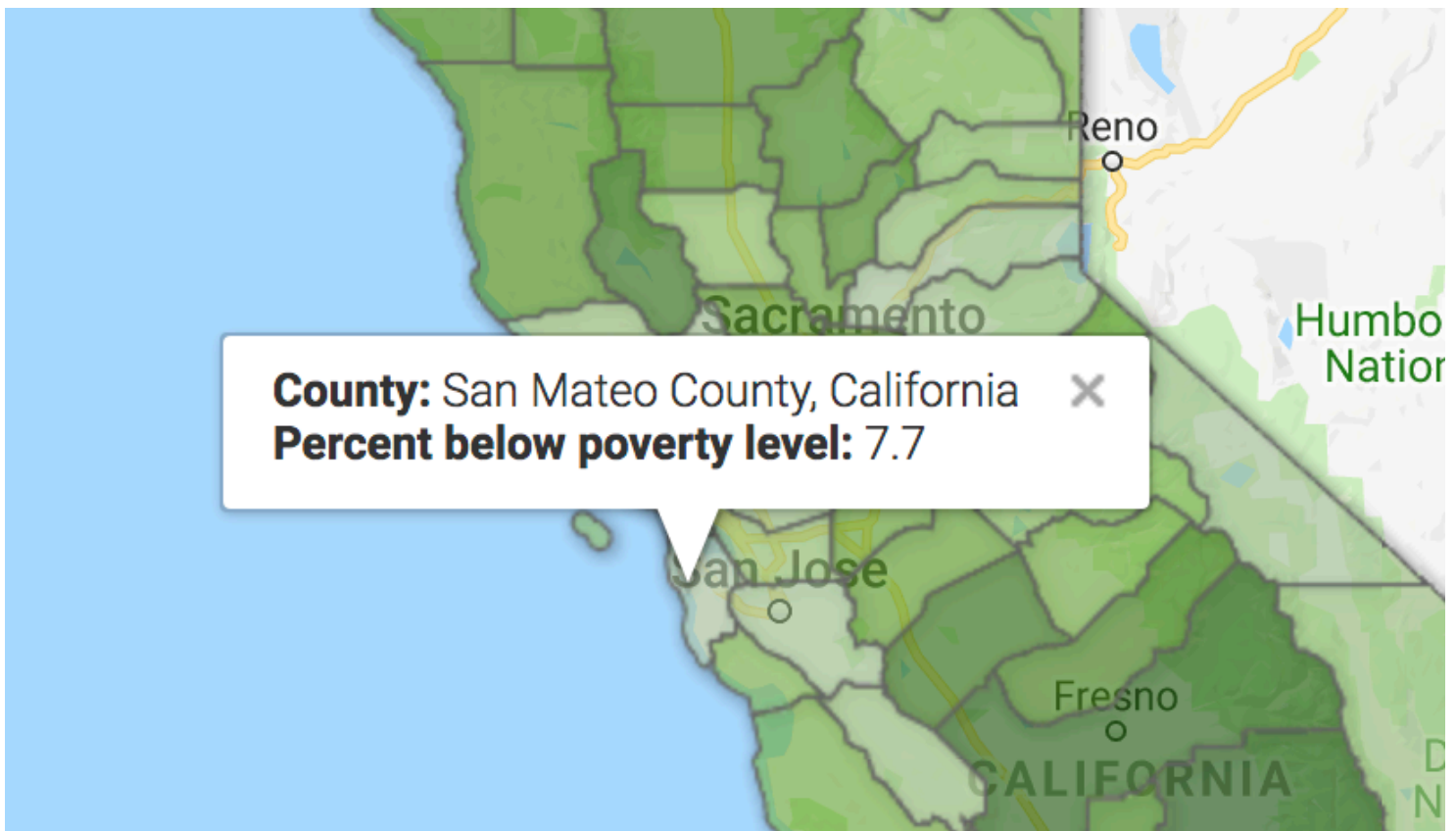
Change info window layout

[Automatic](#) Custom

Write the HTML for your info window with column placeholders like {column name}. [Learn more](#)

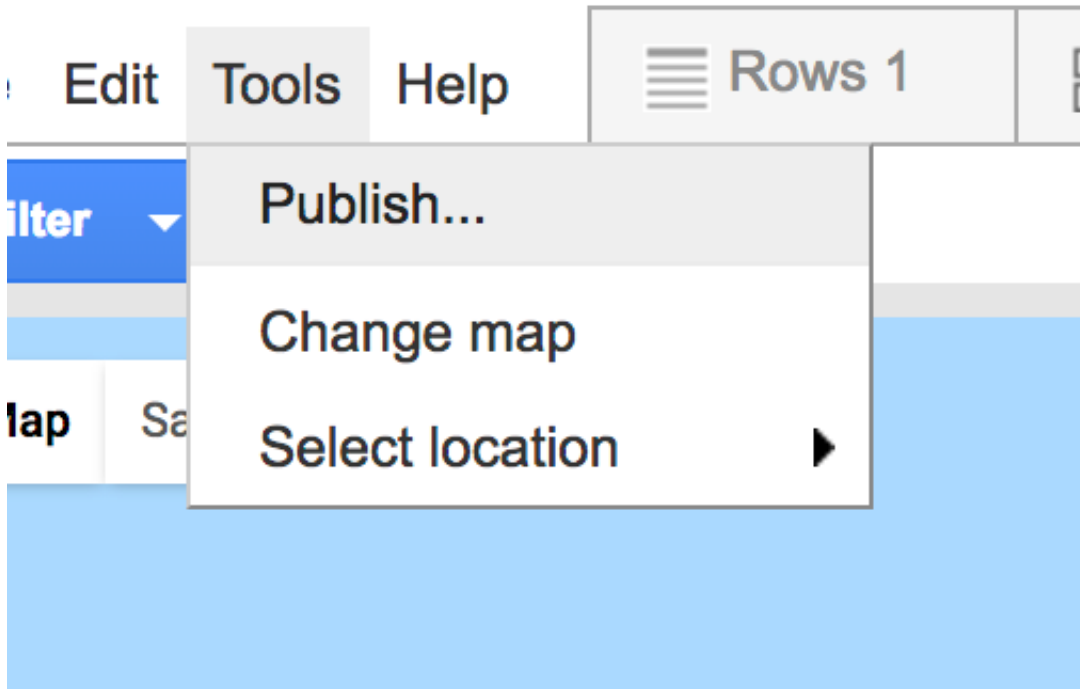
Geography	<code><div class='googft-info-window'></code>
Id	<code>County {Geography}
</code>
Id2	<code>Percent below poverty level: {Percent below poverty level}</code>
Percent below poverty level	<code></div></code>
County Name	
State-County	

Finally, click "Save". The pop-up information box should now reflect those changes.



Publishing the map

If you plan to publish the map, go to **Tools -> Publish** :



Click the "Change visibility" link in yellow highlighted area:

Publish

This table is private and will not be visible. [Change visibility](#)

Send a link in email or IM

https://fusiontables.google.com/embedviz?q=select+col4%3E%3E1+from+1pLsqQeQIz_s

Paste HTML to embed in a website

```
<iframe width="500" height="300" scrolling="no" frameborder="no" src="https://fusiontable
```

Width Height

► Get HTML and JavaScript

Click the "Change" link next to Private:

Sharing settings



Link to share (only accessible by collaborators)

https://www.google.com/fusiontables/DataSource?docid=1pLsqQeQIz_soEJ5yTpa4ial

Share link via:



Who has access

	Private - Only you can access	Change...
	Serdar Tumgoren (you) zstumgoren@gmail.com	Is owner

Invite people:

Enter names or email addresses...



Owner settings [Learn more](#)

☐ Prevent editors from changing access and adding new people

Done

Select the "Public on the web" option and click "Save":

Link sharing



On - Public on the web

Anyone on the Internet can find and access. No sign-in required.



On - Anyone with the link

Anyone who has the link can access. No sign-in required.



Off - Specific people

Shared with specific people.

Access: **Anyone (no sign-in required)** Can view

Save

Cancel

You can now share the link to this map or use the iframe or HTML provided by Fusion Tables to embed it on a web page.