# How to use the Map Reliability Calculator

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**tl;dr** Download Census data. Get rid of extra columns, blank cells, and special characters. The first column should be estimates, and the second should be MOEs. Export as a `.csv`. `Use the calculator`.

## 1. Download Census data.

You can do this using the `Census API` (as seen below) or by visiting `data.census.gov` and downloading your data from there. The chunk below uses the Census API to download the number of Hispanic or Latino residents at the census tract level for Philadelphia County, PA. If you haven't used the Census API before, then you'll need to `Request a Key` and place it in `YOUR KEY HERE`.

```
library(tidycensus); library(tidyverse)
# census_api_key("YOUR KEY HERE")
data <- get_acs(state = "PA", county = 101, geography = "tract", variables = "B03003_003")
```

Here's what the results look like:

```
head(data)
```

```
## # A tibble: 6 x 5
##   GEOID      NAME                                     variable  estimate   moe
##   <chr>      <chr>                                    <chr>        <dbl> <dbl>
## 1 421010001~ Census Tract 1, Philadelphia County,~ B03003_0~      265   131
## 2 421010002~ Census Tract 2, Philadelphia County,~ B03003_0~      118   161
## 3 421010003~ Census Tract 3, Philadelphia County,~ B03003_0~      297   164
## 4 421010004~ Census Tract 4.01, Philadelphia Coun~ B03003_0~      137    84
## 5 421010004~ Census Tract 4.02, Philadelphia Coun~ B03003_0~       29    33
## 6 421010005~ Census Tract 5, Philadelphia County,~ B03003_0~      312   243
```

## 2. Get rid of extra columns, blank cells, and special characters.

The chunk below grabs the estimate and the MOE columns and drops any observations with `NAs`.

```
data <- data %>%
  select(estimate, moe) %>%
  drop_na()
```

### What your data should look like:

Column names don't matter as long as the estimate is first and the MOE is second.

```
head(data)
```

```
## # A tibble: 6 x 2
##   estimate   moe
##      <dbl> <dbl>
## 1      265   131
## 2      118   161
```

```
## 3      297   164
## 4      137    84
## 5       29    33
## 6      312   243
```

## 3. Export as a `.csv`.

Change the file path below to somewhere on your PC.

```
write.csv(data, file = "D:/alarson/export.csv", row.names = FALSE)
```

## 4. Use the calculator.

Visit the `Map Reliability Calculator` and drop in your new dataset.

**The calculator has a lot of functions. Let's walk through them:**

1. **Data upload**, located top left. Click the **browse** button to add your dataset.
   - **File has a header**, located top left. Uncheck this if your .csv has no column names.
   - **Include estimates of 0 in error calculations**, located top left. Uncheck this if you want to exclude observations with estimates of 0.
2. **Summary of expected errors**, located top center. A quick summary of the classification schemes and number of breaks well-suited for your dataset.
3. **Select number of classes**, located top left. Once you're set on a number of classes for your map, select the number in the drop-down menu. Your selection changes the results of **Error by number of classes**.
4. **Acceptable error percentage**, located top left. Default is 10%.
5. **Custom comma-delimited breaks**, located top left.
6. **Error by number of classes**, located bottom center. When you select a number of classes, this section provides:
   - Overall expected classification error
   - Lower bound error by class
   - Upper bound error by class
   - Number of observations in each class
   - Total class error
7. **Summary of data uploaded**, located bottom left. Shows summary statistics of your data.
8. **Break values**, located bottom left. This can be especially useful when you want to tweak the breaks of an existing classification scheme to make it better.