

THEMATIC MAPS WITH GOOGLE FUSION TABLES

(Data for this tutorial at www.peteraldhous.com/Data)

Journalists often want to create thematic web maps, in which geographic areas are filled in with color/shade according to data values, for example: <http://www.texastribune.org/library/data/census-2010/>

Thanks to Google Fusion Tables, creating basic thematic maps and embedding them on a web page is now easy. First we need to be logged in at <http://www.google.com/fusiontables/Home> with a Google account.

We're going to create a map illustrating the intensity of violent crime in Chicago.

First we need a map defining the boundaries of the 77 Community Areas that make up the city, downloaded as a "shapefile" from <https://data.cityofchicago.org/Facilities-Geographic-Boundaries/Boundaries-Community-Areas/i65m-w5fr> in the zipped folder **CommAreas**.

Shapefiles are a format used in Geographic Information Systems (GIS). They consist of a series of files, one of which (with the extension .dbf) is a table of data. Shapefiles can be obtained from various sources; here's a good general library: <http://www.naturalearthdata.com/downloads/>.

This map is already in Fusion Tables. However, if you need to upload a shapefile, go to <http://shpescape.com/> and upload the zipped folder (there's no need to use the Advanced Options). Geographic boundaries in KML format, used by Google Earth, will upload directly.

Open the uploaded shapefile (at <http://bit.ly/J4ueFL>). You should see a screen like this:

CommAreas.shp Get link Permissions

File View Edit Visualize Merge Experiment

Showing all rows [options](#) 1 - 77 of 77

| geometry ▾ | geometry_vertex_cc | AREA ▾ | PERIMETER ▾ | COMAREA_ ▾ | COMAREA_ID ▾ | AREA_NUMBE ▾ | COMMUNITY ▾ | |
|------------|--------------------|--------|-------------|------------|--------------|--------------|--------------------|---|
| kml... | 352 | | | | | 35 | DOUGLAS | 🗨 |
| kml... | 314 | | | | | 36 | OAKLAND | 🗨 |
| kml... | 317 | | | | | 37 | FULLER PARK | 🗨 |
| kml... | 328 | | | | | 38 | GRAND BOULEVARD | 🗨 |
| kml... | 693 | | | | | 39 | KENWOOD | 🗨 |
| kml... | 779 | | | | | 4 | LINCOLN SQUARE | 🗨 |
| kml... | 305 | | | | | 40 | WASHINGTON PARK | 🗨 |
| kml... | 730 | | | | | 41 | HYDE PARK | 🗨 |
| kml... | 921 | | | | | 42 | WOODLAWN | 🗨 |
| kml... | 926 | | | | | 1 | ROGERS PARK | 🗨 |
| kml... | 1036 | | | | | 11 | JEFFERSON PARK | 🗨 |
| kml... | 1883 | | | | | 12 | FOREST GLEN | 🗨 |
| kml... | 1002 | | | | | 13 | NORTH PARK | 🗨 |
| kml... | 765 | | | | | 14 | ALBANY PARK | 🗨 |
| kml... | 594 | | | | | 15 | PORTAGE PARK | 🗨 |
| kml... | 657 | | | | | 16 | IRVING PARK | 🗨 |
| kml... | 962 | | | | | 17 | DUNNING | 🗨 |
| kml... | 316 | | | | | 18 | MONTCLARE | 🗨 |
| kml... | 437 | | | | | 19 | BELMONT CRAGIN | 🗨 |
| kml... | 615 | | | | | 2 | WEST RIDGE | 🗨 |
| kml... | 261 | | | | | 20 | HERMOSA | 🗨 |
| kml... | 547 | | | | | 21 | AVONDALE | 🗨 |
| kml... | 678 | | | | | 22 | LOGAN SQUARE | 🗨 |
| kml... | 504 | | | | | 23 | HUMBOLDT PARK | 🗨 |
| kml... | 738 | | | | | 24 | WEST TOWN | 🗨 |
| kml... | 981 | | | | | 25 | AUSTIN | 🗨 |
| kml... | 354 | | | | | 26 | WEST GARFIELD PARK | 🗨 |
| kml... | 403 | | | | | 27 | EAST GARFIELD PARK | 🗨 |
| kml... | 609 | | | | | 28 | NEAR WEST SIDE | 🗨 |
| kml... | 522 | | | | | 29 | NORTH LAWNSDALE | 🗨 |
| kml... | 1032 | | | | | 3 | UPTOWN | 🗨 |
| kml... | 481 | | | | | 30 | SOUTH LAWNSDALE | 🗨 |
| kml... | 343 | | | | | 31 | LOWER WEST SIDE | 🗨 |
| kml... | 1488 | | | | | 33 | NEAR SOUTH SIDE | 🗨 |

Click the little button with the triangle near the top right to scroll across to see the other columns in the table.

See that each Community Area has a number, in the fields beginning **AREA_NUM**, which we're going to use later to pull in the crime data that we're going to map.

We can now close this table using **File>Close** in the top menu.

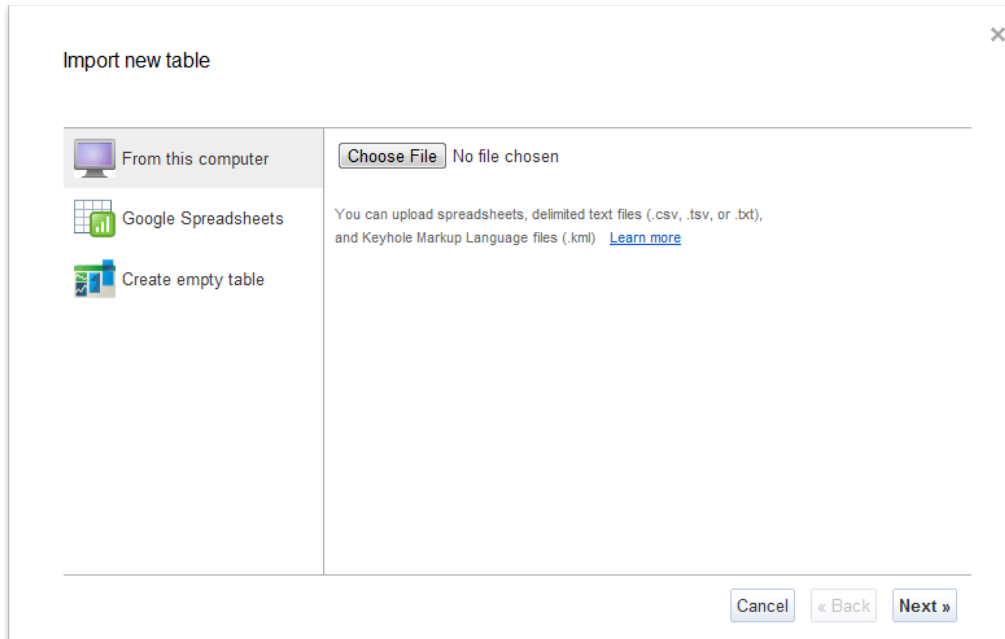
The crime data is in the spreadsheet **2011 Chicago violent crime and population.xlsx**; the numbers came from a search of a year's violent crime incidents at <http://gis.chicagopolice.org/> and the *Chicago Tribune*'s analysis of the 2010 US Census.

Note that in this spreadsheet each Community Area has an **ID**, which corresponds to the **AREA_NUM** fields in the shapefile.

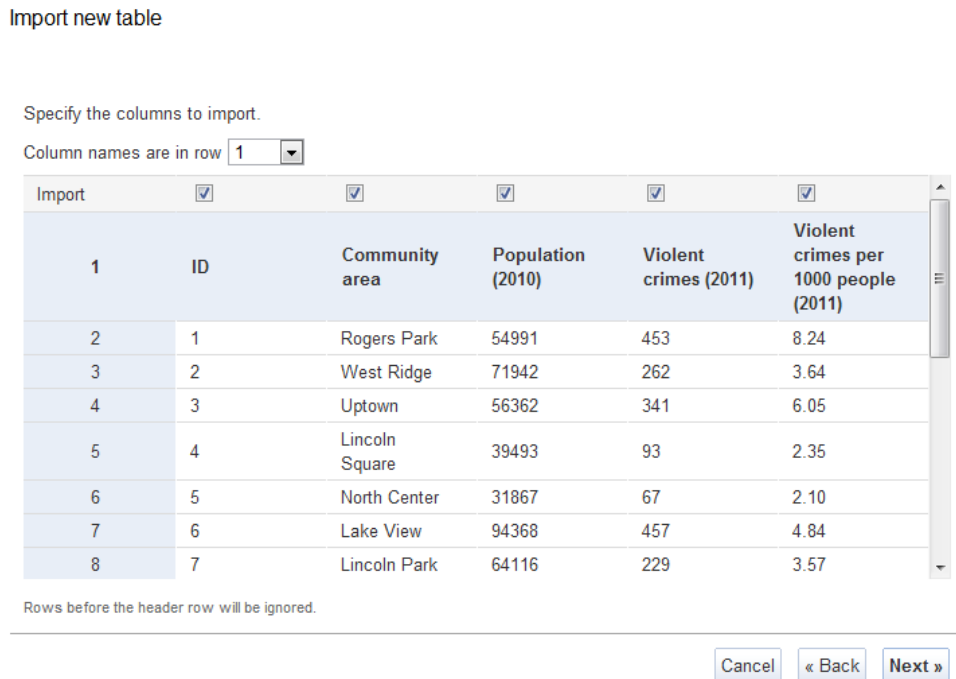
| | A | B | C | D | E | F | G | H |
|----|----|-----------------|-------------------|-----------------------|---------------------------------------|---|---|---|
| | | | | | Violent crimes per 1000 people (2011) | | | |
| 1 | ID | Community area | Population (2010) | Violent crimes (2011) | | | | |
| 2 | 1 | Rogers Park | 54991 | 453 | 8.24 | | | |
| 3 | 2 | West Ridge | 71942 | 262 | 3.64 | | | |
| 4 | 3 | Uptown | 56362 | 341 | 6.05 | | | |
| 5 | 4 | Lincoln Square | 39493 | 93 | 2.35 | | | |
| 6 | 5 | North Center | 31867 | 67 | 2.10 | | | |
| 7 | 6 | Lake View | 94368 | 457 | 4.84 | | | |
| 8 | 7 | Lincoln Park | 64116 | 229 | 3.57 | | | |
| 9 | 8 | Near North Side | 80484 | 596 | 7.41 | | | |
| 10 | 9 | Edison Park | 11187 | 3 | 0.27 | | | |
| 11 | 10 | Norwood Park | 37023 | 37 | 1.00 | | | |
| 12 | 11 | Jefferson Park | 25448 | 41 | 1.61 | | | |
| 13 | 12 | Forest Glen | 18508 | 15 | 0.81 | | | |
| 14 | 13 | North Park | 17931 | 55 | 3.07 | | | |
| 15 | 14 | Albany Park | 51542 | 230 | 4.46 | | | |
| 16 | 15 | Portage Park | 64124 | 245 | 3.82 | | | |
| 17 | 16 | Irving Park | 53359 | 292 | 5.47 | | | |

We're later going to color the Community Areas according to the data for **Violent crimes per 1000 people (2011)**. Sorting the data in the spreadsheet we can see that this peaks at 51.33 for Fuller Park.

Back in Fusion Tables import the spreadsheet by clicking on **Create>Table**. At the first dialog box, select **From this computer**, and hit **Choose File**:



Select your spreadsheet, click **Next**, and again at the second dialog box:



If you wish, you can add some notes about your spreadsheet at the third dialog box, then click **Finish** and it should load.

Next we're going to format the data so it displays nicely on our map. Select **Edit>Modify columns** from the top menu. For the two numeric fields we're going to map, set the format as follows, so we get a comma to separate thousands in the **Population (2012)** field and don't have too many trailing decimal places for the **Violent crimes per 1000 people (2011)** field.

Configure columns

| Table Columns | Number |
|---------------------------------------|--------|
| ID | Number |
| Community area | Text |
| Population (2010) | Number |
| Violent crimes (2011) | Number |
| Violent crimes per 1000 people (2011) | Number |

Column Details

Column name: Population (2010)

Type: Number

Format: 1,234.56

Save Cancel

Hit the **Save** button.

Before we can make our map, we need to join the two tables together. Still in the uploaded spreadsheet, select **Merge** from the top menu.

Merge with another table ×

1 Choose the column to use for matching data across the two tables

2 Merge with

Enter a table name, ID, or URL

2011 Chicago violent crime and population.xlsx

- ID
- Community area
- Population (2010)
- Violent crimes (2011)
- Violent crimes per 1000 people (2011)

Select subset of columns

Select subset of columns

Save as a new table named

The merged table will be computed dynamically from the two base tables, using the rows from the first table. Changes to the base tables will be reflected in the merged table and vice versa.

If you click in the **Merge with** box, you should get the option to select your own tables. We want to merge with the CommAreas shapefile, which we can select by entering its URL, or its ID number: 680103. (To find the ID of a Fusion Table, select **File>About**.)

Select the **ID** field in on the left and one of the **AREA_NUM** fields on the right to join the tables on these fields. Check the **Select a subset of columns** checkbox for each tables, to import only those fields we want to use. From the shapefile, we need only select the **geometry column**, which will be used to draw the map. Add a name for the new table and then hit the **Merge tables** button at bottom left.

Merge with another table ×

1 Choose the column to use for matching data across the two tables

2 Merge with

680103

Enter a table name, ID, or URL

2011 Chicago violent crime and population.xlsx CommAreas.shp

| | |
|---|---|
| <input checked="" type="checkbox"/> <input checked="" type="radio"/> ID | <input checked="" type="checkbox"/> <input type="radio"/> geometry |
| <input checked="" type="checkbox"/> <input type="radio"/> Community area | <input type="checkbox"/> <input type="radio"/> geometry_vertex_count |
| <input checked="" type="checkbox"/> <input type="radio"/> Population (2010) | <input type="checkbox"/> <input type="radio"/> AREA |
| <input type="checkbox"/> <input type="radio"/> Violent crimes (2011) | <input type="checkbox"/> <input type="radio"/> PERIMETER |
| <input checked="" type="checkbox"/> <input type="radio"/> Violent crimes per 1000 people (2011) | <input type="checkbox"/> <input type="radio"/> COMAREA_ |
| | <input type="checkbox"/> <input type="radio"/> COMAREA_ID |
| | <input checked="" type="checkbox"/> <input checked="" type="radio"/> AREA_NUMBE |
| | <input type="checkbox"/> <input type="radio"/> COMMUNITY |
| | <input type="checkbox"/> <input type="radio"/> AREA_NUM_1 |
| | <input type="checkbox"/> <input type="radio"/> SHAPE AREA |

Select subset of columns Select subset of columns

Save as a new table named

The merged table will be computed dynamically from the two base tables, using the rows from the first table. Changes to the base tables will be reflected in the merged table and vice versa.

Now we can start mapping. Select **Visualize>Map** in the top menu. Click on the **Configure info window contents** link. This is where we define what goes in the bubbles that appear when someone clicks on the map.

In the **Automatic** tab, uncheck ID, as we don't want this field to appear. Then select the **Custom** tab and we'll do some edits in the html code, adding some line breaks using **
** tags:

Change info window layout ×

AutomaticCustom

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

| | |
|--|--|
| ID Community area Population (2010) Violent crimes per 1000 people (2011) geometry | <pre><div class='googft-info-window' style='font-family: sans-serif'> Community area: {Community area} Population (2010): {Population (2010)} Violent crimes per 1000 people (2011): {Violent crimes per 1000 people (2011)} </div></pre> |
|--|--|

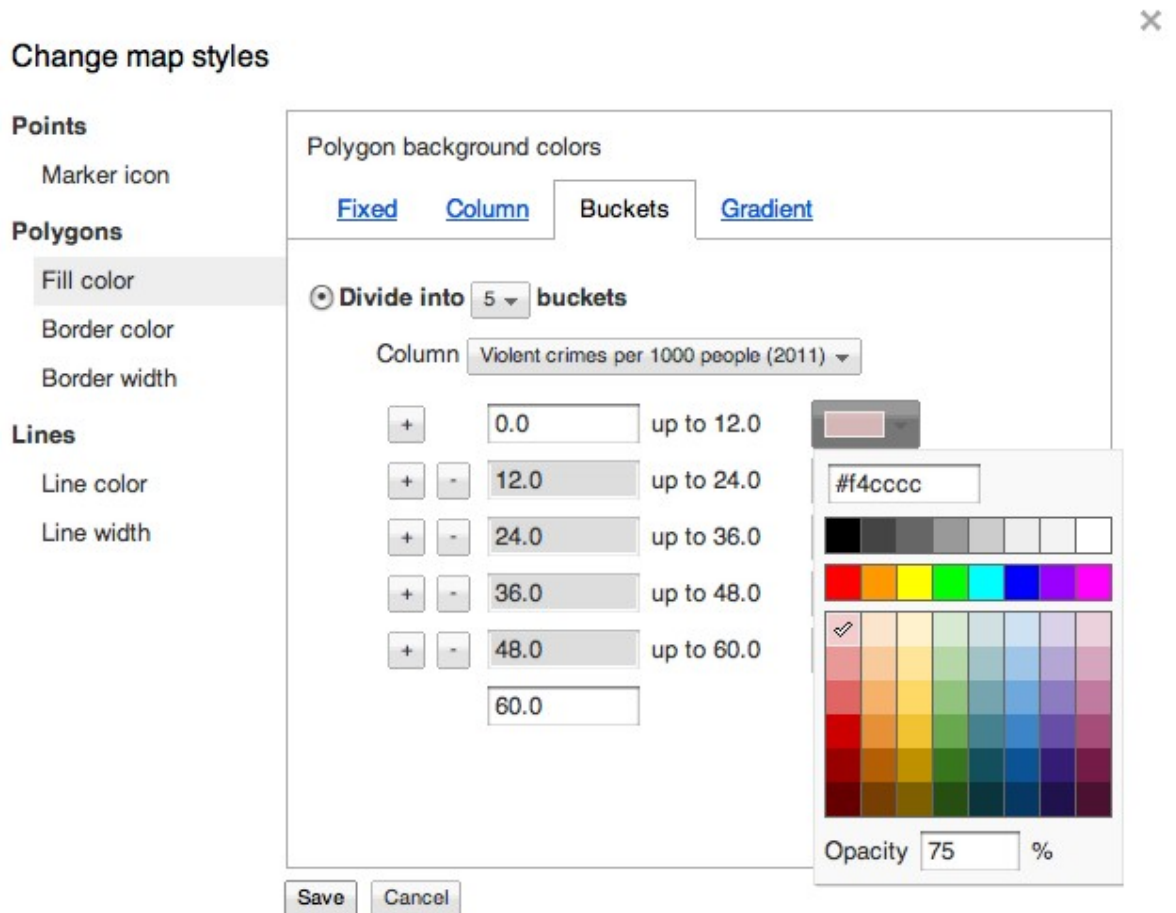
SaveCancel

Hit the **Save** button.

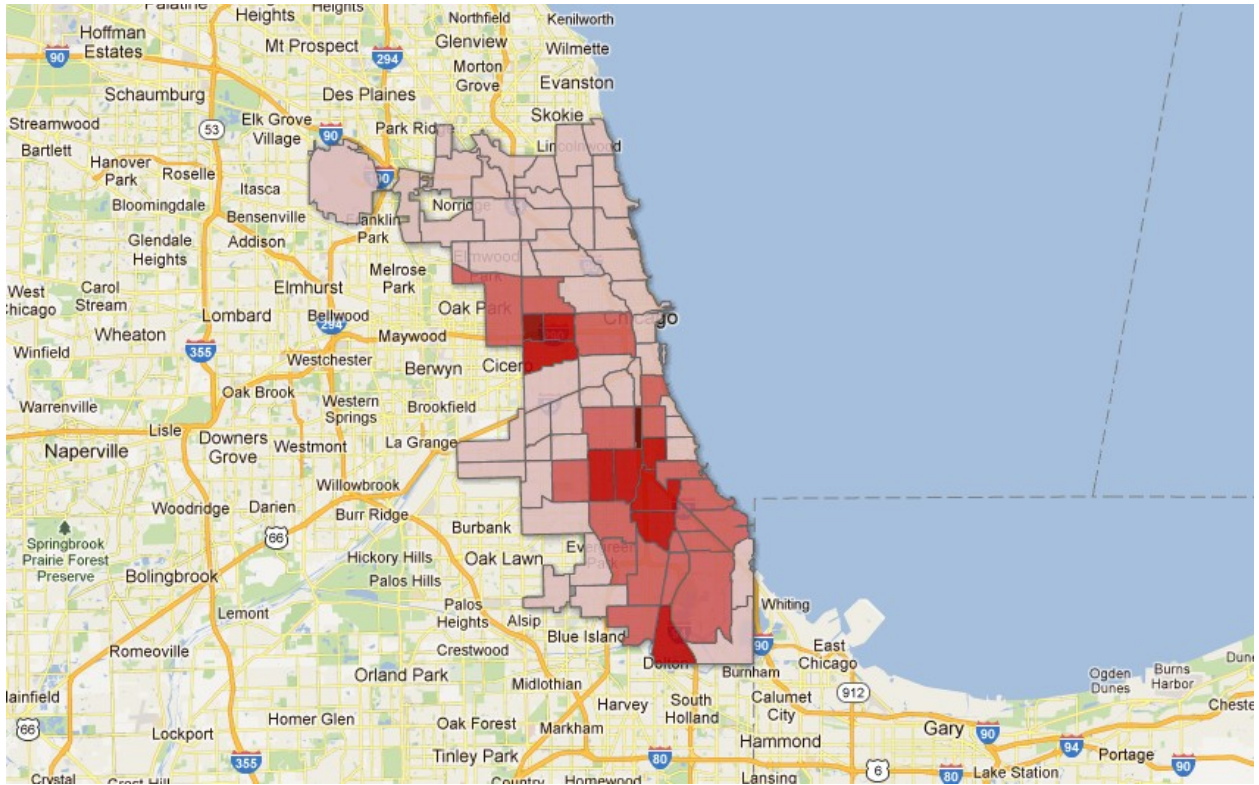
Now let's color the areas according to their intensity of violent crime. Click the **Configure styles** link, select **Polygons>Fill color**, and select the **Buckets** tab.

In this tab select **Violent crimes per 1000 people (2011)** as the **Column** to map. It's worth experimenting the number of buckets and the splits between them to give the best display for your data. In this case we'll **Divide into 5 buckets** and type in **60** as the maximum value at the bottom.

Then we can select a color scheme, also selecting **75%** for opacity so the colors stand out nicely from the Google map.



Hit the **Save** button, and here is the thematic map:



Before we can embed the map on our website, we need to make it visible to the wider world by clicking the **Share** button at top right and selecting **Public** under **Visibility options**.

The simplest way to embed the map is to click **Get embeddable link**, and change the width and height from the defaults to the appropriate size for your website. You can then select and copy the embed code and paste it into the html of a webpage.

2011 Chicago Crime and Population Map

File View Edit Visualize Merge Experiment

Showing all rows [options](#)

Location Display as heat map [Configure info window](#) [Configure styles](#) [Export to KML](#) [Get KML network link](#) [Get embeddable link](#)

```
<iframe width="500" height="300" scrolling="no" src="https://www.google.com/fusiontables/embedviz?viz=MAP&q=select+col0%3E%3E1+from+3636437+&h=false&lat=41.81463011081473&lng=-87.76645786859063&z=10&t=1&l=col0%3E%3E1"></iframe>
```

However, we'll obtain a nicer embed, and also be able to customize the Google map, if we use the **Fusion Tables Layer Wizard**.

Get the ID number for the table by selecting **File>About**, then go to the wizard at: http://gmaps-samples.googlecode.com/svn/trunk/fusiontables/fusiontableslayer_builder_new.html

Paste in the table ID, select geometry as the location column, and hit the **Add layer** button. At this point we have to zoom the **Preview** map into Chicago, and then add the dimensions for the embed and hit the **Edit map** button.

Edit Map

Dimensions: W: px, H: px

Map Center:

Zoom:

Style Map

Show: All features [More options](#)

Saturation: Gray Bright

Add layer

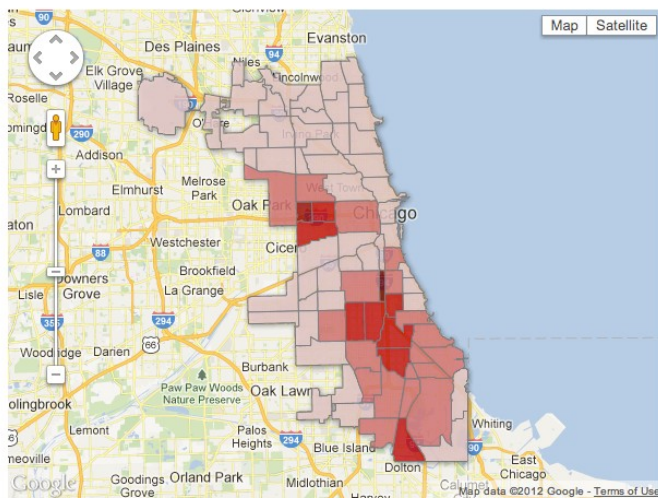
Your table id:

Location Column:

Filter (opt.): WHERE

Add another feature

Preview



The layer wizard also allows you to add a second layer (for example mapping points over the top of a thematic map), and lets you add a box to isolate a particular area or point by making a selection or with a text search.

Under **More options** under **Style Map**, you can remove unwanted features from the Google Map. If you really want to go to town in styling our map you can also use the Google Maps API Styled Map Wizard (<http://gmaps-samples-v3.googlecode.com/svn/trunk/styledmaps/wizard/index.html>) to obtain the code necessary to make further changes. Beware, however, that styling a Google Map greatly reduces the usage limits before which Google may pursue you for charges, see <https://developers.google.com/maps/faq#usagelimits>. So if your map may get a lot of traffic, it's best not to use the styling options. (Unstyled maps are unlikely to exceed usage limits, except on very busy sites.)

When you are finished, copy the code in the box at the bottom of the wizard into the html for your webpage.

Examples:

For inspiration, see the gallery at:

<https://sites.google.com/site/fusionablestalks/stories>

More tutorials:

Google's tutorial on making a thematic map:

<http://www.google.com/support/fusionables/bin/answer.py?hl=en&answer=1032332>

How to map points (latitude and longitude, addresses etc), and to display as a heat map revealing the density of points, if you have lots of them:

http://earth.google.com/outreach/tutorial_fusion_yourrowndata.html

More on ways to embed/share a map:

http://earth.google.com/outreach/tutorial_fusion_publish.html#embedmap2