Mapping with CartoDB (Tanzania water edition)

In this exercise we are going to use water data to build informative maps of Tanzania.

In order to complete this exercise you need to have a CartoDB account. This can be created at http://cartodb.com

This exercise requires a number of key datasets that are available to download from the course website.

1. The regional boundaries of Tanzania. (Source: Tanzania National Bureau of Statistics)
2. Water points open data. (Source: Opendata.go.tz)

Step 1 - Preparing the data (already done)

In order to prepare each dataset, several translations have been carried out to extract it from the source and translate each dataset into formats appropriate for use with CartoDB. These steps are briefly described below.

Regional boundary files

Source: Tanzania National Bureau of Statistics (NBS)
Source URL:
http://www.nbs.go.tz/nbstz/index.php/english/statistics-by-subject/population-and-housing-census/258-2012-phc-shapefiles-level-one-and-two

These files come as a rather large zip file containing a lot of shape files. Shape files (SHP) are a zip file format developed by ESRI to a “mostly” open specification. The terms of the specification are vague, particularly around usage rights, many online tools choose not to support the format for legal reasons. This means that in order to make the format usable, we need to translate it into something compatible with more tools.

Unwanted data was first removed from the source NBS zip file, leaving only the region data inside the zip file. This zip file was then uploaded to the SHP to KML translator available at http://www.mapsdata.co.uk/online-file-converter/.

The resultant KML has been made available on the course website and is the one required for the exercise.

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Water points data

Source: Opendata.go.tz
URL: http://opendata.go.tz/dataset/water-dashboard/resource/58edfa63-b329-45b5-b17f-27603420cd10

For the purposes of this exercises the data has been simplified. This has been done through reduction in the number of types of water sources as well as water qualities.

This process was done using OpenRefine.

The following changes were made to water quality:

SALTY ABANDONED and FLUORIDE ABANDONED changed to ABANDONED
FLUORIDE changed to GOOD

The following changes were made to water source:

HAND DTW, MACHINE DBH, MACHINE-DRILLED BOREHOLE and SHALLOW WELL changed to WELL (Hand/Machine/Shallow)
LAKE, RIVER and DAM changed to FLOWING (Lake/River/Dam)
OTHER and UNKNOWN changed to UNKNOWN/OTHER

Step 2 - Create water points map of Tanzania

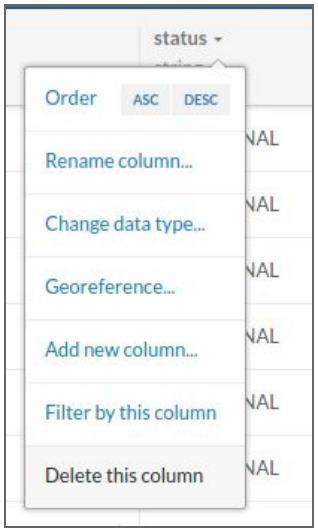
Once you are logged into CartoDB, in the top right hand corner of the screen you should be able to select **maps** or **datasets**. Click **maps** and then click the **new map** button.

On the next screen ensure you select **connect dataset** from the available options and then upload a **data file**. Here you can drag and drop or browse to upload the allwaterpointsjuly2015-ceaned.csv file (this can be done via URL upload from the shared data location). Click **connect dataset** to upload this file. It may take a while to upload and process.

Step 3 - Filter the data to only functional locations

Ignore the map for now and switch to the **data view**. From here find the status column and click the drop down. From the menu click **Filter by this column**.

From the pop up, click **clear selection** (to deselect everything) and then click **FUNCTIONAL** to only select water points that are functional.



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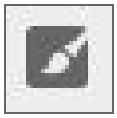
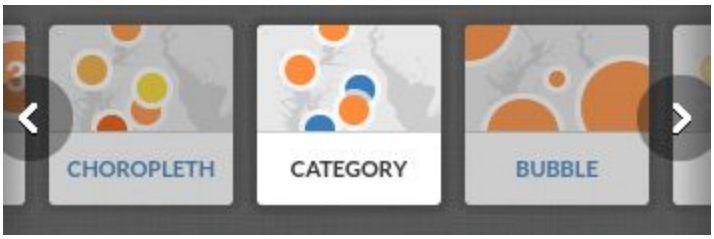
Step 4 - Create your map

Switch to the map view and you will see all the FUNCTIONAL water points plotted. Nice but not very useful to a user.

From the sidebar on the right hand side of the screen click the **wizard icon**.

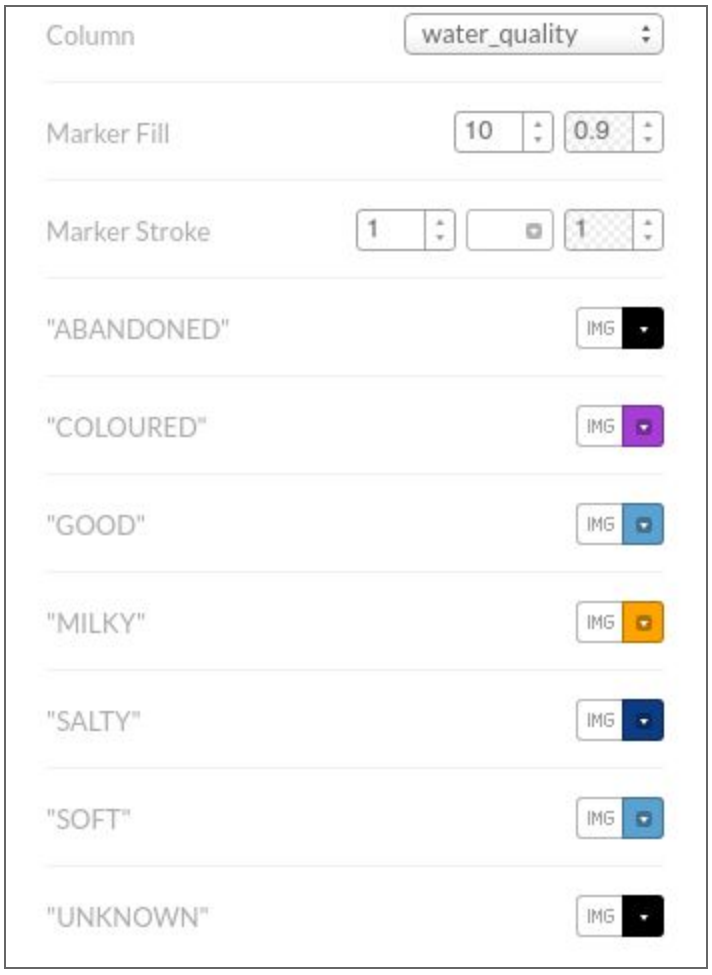


Using the wizard you can quickly customise your map. Scroll along and select **category** map.



In the menu below, select **water_quality** as the **column** and then set different colours for the different qualities as shown.

This should make the map look a little better.



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Step 5 - Add another layer to show source type

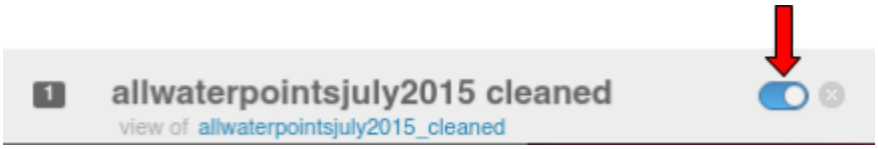
We are going to use icons to show the source types, to do this easily in CartoDB we need to add another map layer.

To do this click the **Add Layer** tab at the top of the layers panel on the right (above your wizard).

Connect the **same** water points dataset and **repeat step 3** to filter the data.

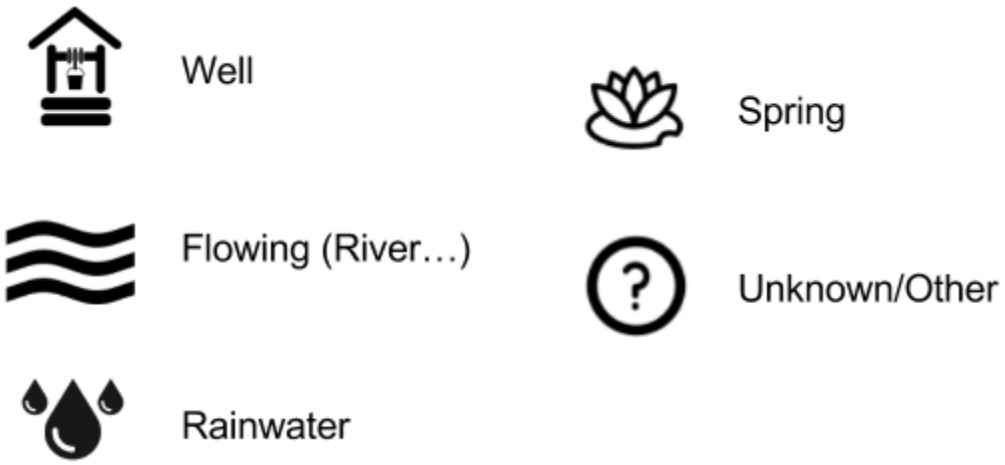
Once done return to the map view and **click number 2** from the panel on the right to open this later.

Before we continue we need to hide layer 1 temporarily. This can be done by **clicking the toggle switch** in the bottom right hand corner against layer 1 to disable it.



Return to layer 2 and select your **wizard icon** and as in step 4, create a category map. This time we want to base the categories on **source_type** and use **icons** to represent the different types.

The icons are available from the course website and are used as follows:



You can either upload the icons one by one or copy and paste the following code into the CSS box. You can get at the CSS box through clicking the CSS icon two under the wizard button.

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```
/** category visualization */

#allwaterpointsjuly2015_cleaned {
   marker-fill-opacity: 0.9;
   marker-line-color: #FFF;
   marker-line-width: 1;
   marker-line-opacity: 1;
   marker-placement: point;
   marker-type: ellipse;
   marker-width: 20;
   marker-allow-overlap: true;
}

#allwaterpointsjuly2015_cleaned[source_type="FLOWING (Lake/River/Dam)"] {
   marker-file: url(http://davetaz.github.io/icons/river.svg);
}
#allwaterpointsjuly2015_cleaned[source_type="RAINWATER"] {
   marker-file: url(http://davetaz.github.io/icons/rainwater.svg);
}
#allwaterpointsjuly2015_cleaned[source_type="SPRING"] {
   marker-file: url(http://davetaz.github.io/icons/spring.svg);
}
#allwaterpointsjuly2015_cleaned[source_type="UNKNOWN/OTHER"] {
   marker-file: url(http://davetaz.github.io/icons/other.svg);
}
#allwaterpointsjuly2015_cleaned[source_type="WELL (Hand/Machine/Shallow)"] {
   marker-file: url(http://davetaz.github.io/icons/well.svg);
}
```

Step 6 - Color the icons by type

From earlier, open layer 1 by clicking it at the bottom of the layers panel.

Click the **css** tab of layer 1.

In the top section:

- Change **marker-line-width: 1** to **marker-line-width: 0**
- Change **marker-width: 10** to **marker-width: 0**

Copy all of the code from line 14 onwards to your clipboard.

Open up the **CSS** tab of **Layer 2**.

Paste the code **at the bottom** of this tab.

Click **apply style**. This should change all the icon colours to those which represent the water type.

Finally, toggle the **layer 1** switch as in step 5 to re-enable this layer and show the legend.

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Step 7 - Adding labels

Click on any icon on the map and you will note that the label text is not very helpful.

Before we add labels, note that in this view you can also edit the geometry of the point by clicking the **edit geometry** button .

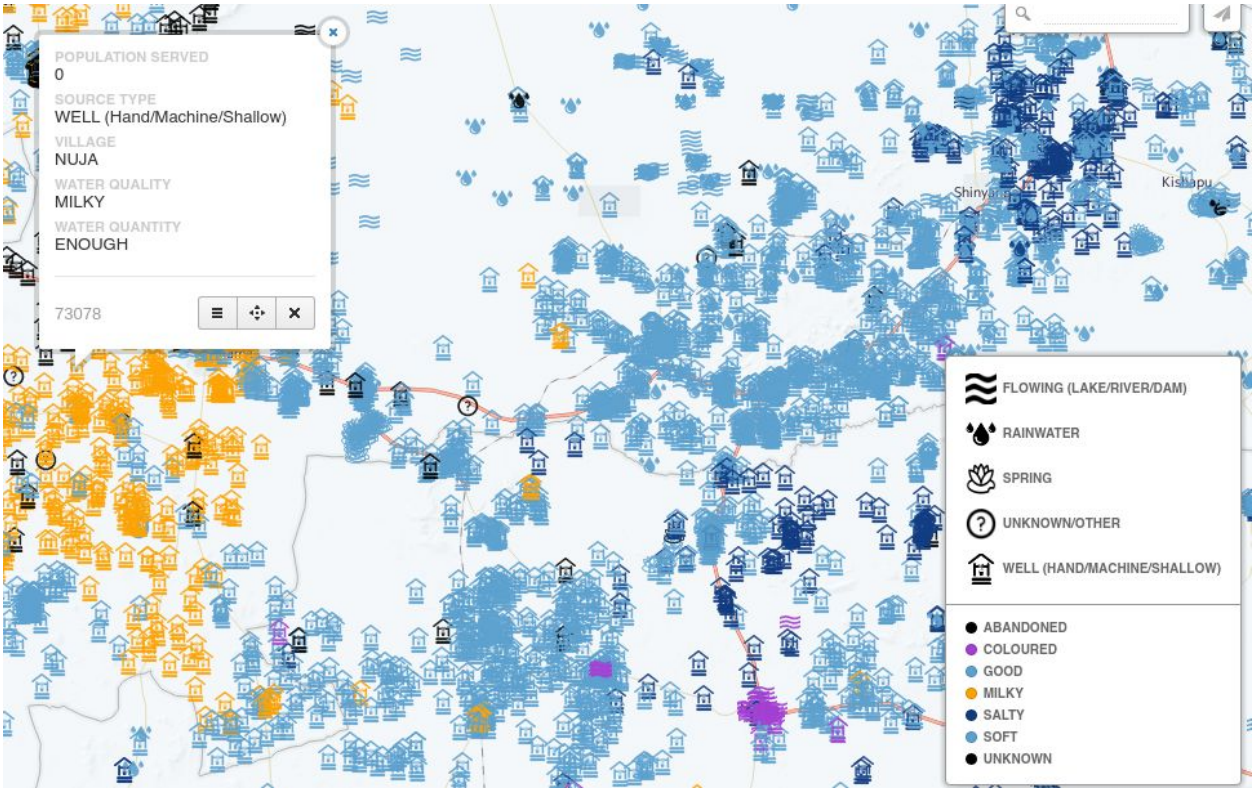
Click **select field** from the popup and choose those you wish to display from the wizard on the right.

Even though this is easy, it doesn't produce very clear labels. Luckily everything in CartoDB can be customised in code.

To customise how the labels look, click the change html </> icon.

If you know HTML code, feel free to play around with this.

When done click apply to update the label style.



Map of functional water supplies in Tanzania

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