

## [Geographic Information for Vector Surveillance](#)

Week 1 Day 5

### **Producing maps from your own data**



Learning objectives

- apply techniques learnt earlier in the week to your own data
- able to ask the instructors about anything you have not understood
- able to investigate anything else you would like to be able to do with your data

Length : 1 day

Updated : September 2018

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To get you started we have provided a few short exercises to get you started with data for your own country :

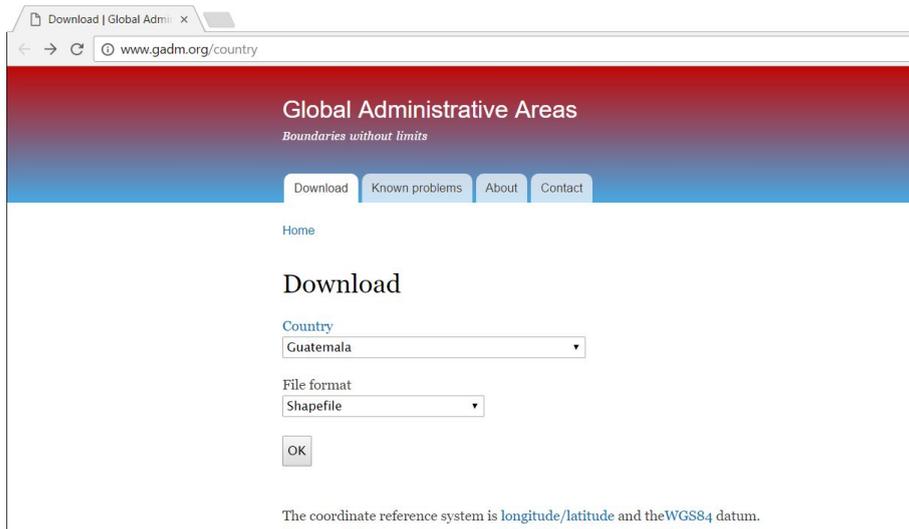
5.1) download detailed administrative boundary data and join other data to it.

5.2) download OpenStreetMap data to obtain named streets to be able interactively to add points within QGIS.

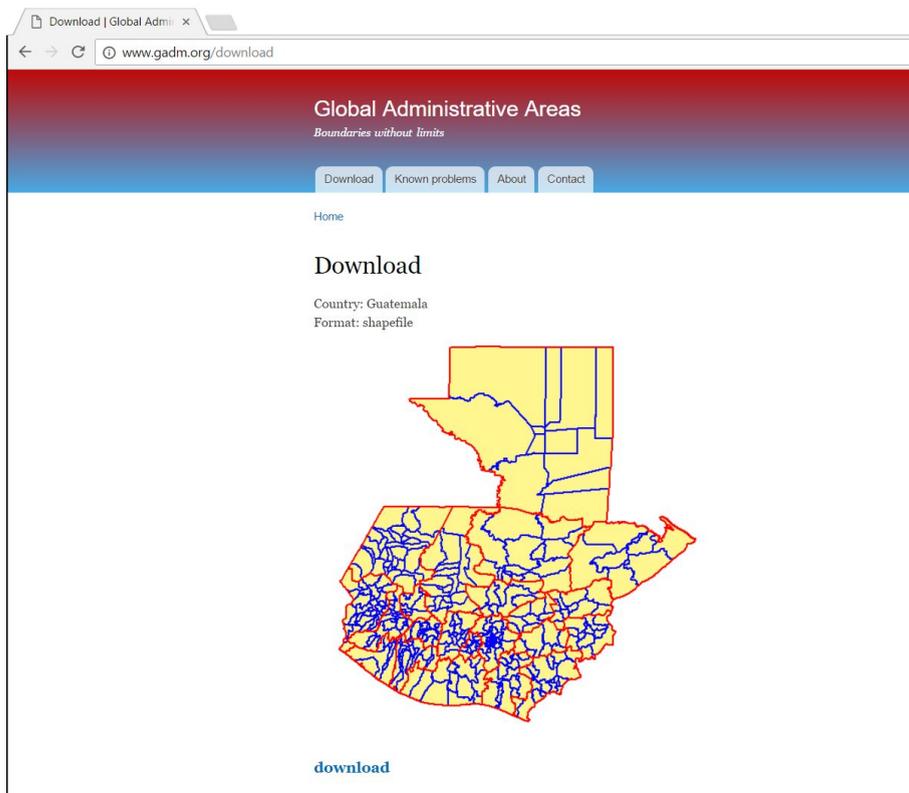
**The instructions below use data for Guatemala as an example, but we suggest that you do this for your own country.**

### 5.1 Using administrative boundary data from GADM

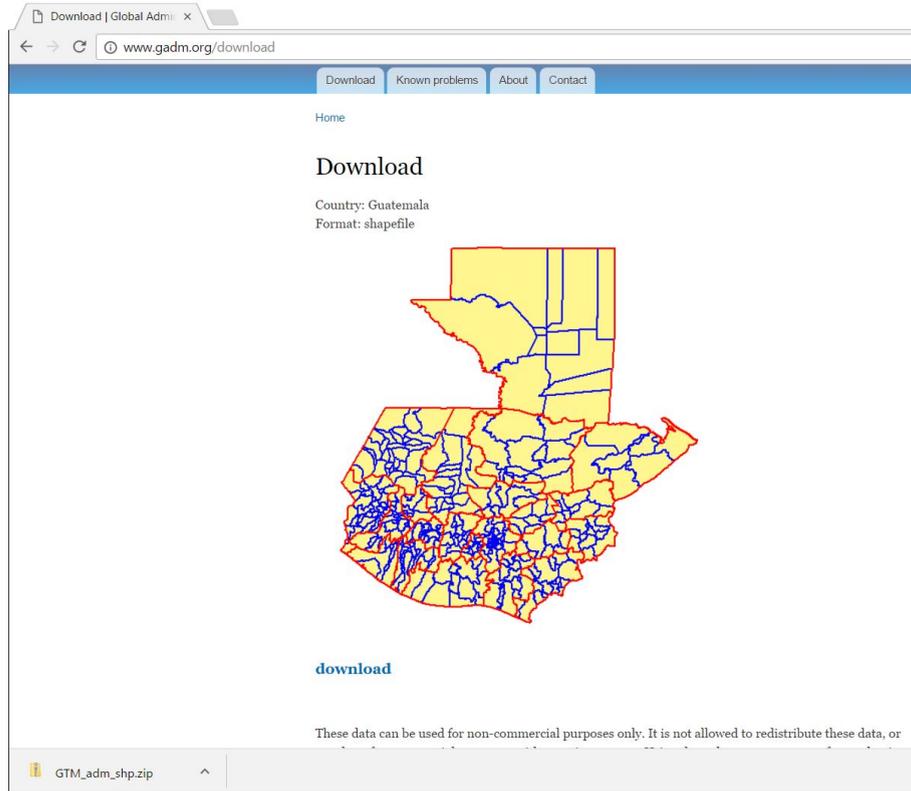
- Go to <http://www.gadm.org/country>
- Select your country.
- Select File format : Shapefile.
- Press OK.



→ At the next screen press the download button below the map.



→ Save the data zip file to : `mi_trabajo\datos\poligonos`. (Depending on how your browser is set up the file may appear below and you can click and drag and drop into the desired folder).

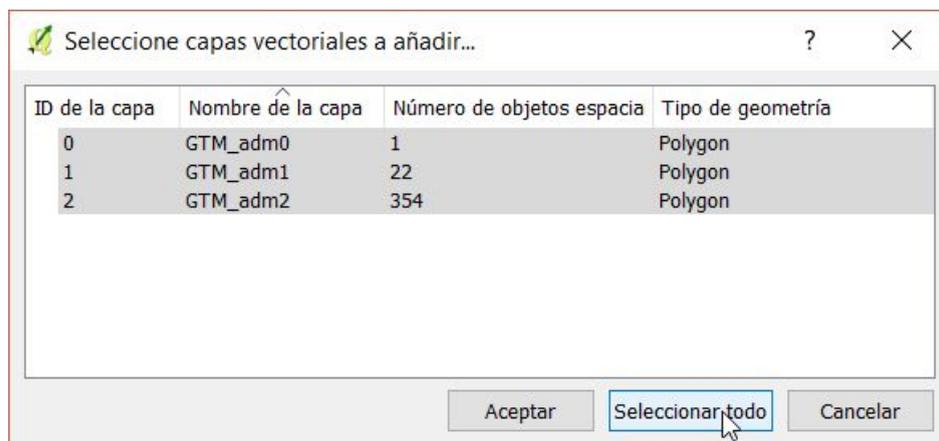


If you have difficulties downloading this boundary data we have also saved the data for all participating countries on the USB in the folder datos\_GADM.

Create a new QGIS project as we have done before (hint: Project, New).

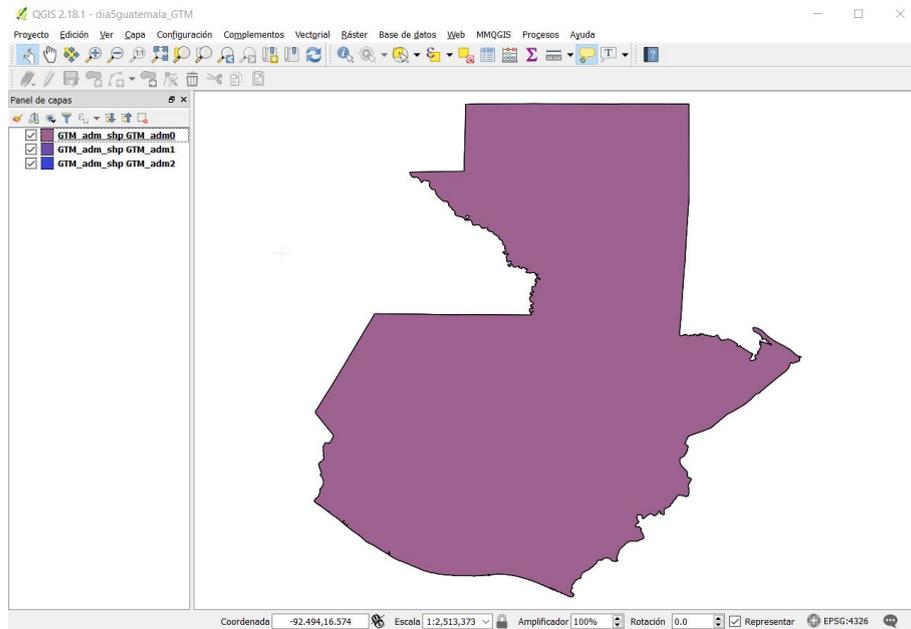
Click Layer, Add Layer, Add Vector Layer and browse to find the zip file you have just saved.

In previous examples we have added shapefiles into QGIS. QGIS also allows you to add a zipfile containing shapefiles without having to unzip the folder. When you click the open button it will ask you which layers from the zip you want to add. Click 'Select all' and 'Accept' to add all of the layers.

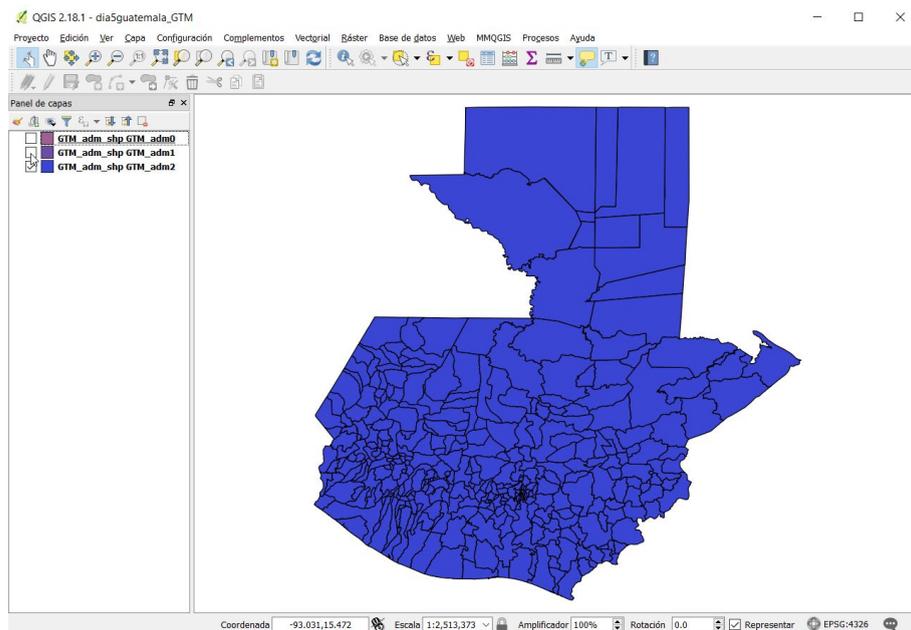


In this case we see that for Guatemala there is 1 admin0 polygon (the country outline), 22 admin1 polygons (departamentos) and 354 admin2 polygons (municipios). This will be different for other countries, some e.g. Panama have admin3 polygons too.

All of the administrative layers will be added into QGIS. You will only be able to initially see the layer that is at the top of the layers panel, which in the example below is the admin0 polygon.



By turning off (unticking) the admin0 and admin1 layers you will be able to see the smaller administrative units.



Open the attribute table (Right click, Abrir table de atributos) for the admin2 layer.

ID_0	ISO	NAME_0	ID_1	NAME_1	ID_2	NAME_2	HASC_2	CCN_2	CCA_2
94	GTM	Guatemala	1	Alta Verapaz	1	Chahal		0	
94	GTM	Guatemala	1	Alta Verapaz	2	Chisec		0	
94	GTM	Guatemala	1	Alta Verapaz	3	Cobán		0	
94	GTM	Guatemala	1	Alta Verapaz	4	Fray Bartolom...		0	
94	GTM	Guatemala	1	Alta Verapaz	5	Lanquín		0	
94	GTM	Guatemala	1	Alta Verapaz	6	Panzós		0	
94	GTM	Guatemala	1	Alta Verapaz	7	San Cristóbal ...		0	
94	GTM	Guatemala	1	Alta Verapaz	8	San Juan Cha...		0	
94	GTM	Guatemala	1	Alta Verapaz	9	San Pedro Ca...		0	
94	GTM	Guatemala	1	Alta Verapaz	10	Santa Cruz Ve...		0	
94	GTM	Guatemala	1	Alta Verapaz	11	Santa María C...		0	
94	GTM	Guatemala	1	Alta Verapaz	12	Senahú		0	
94	GTM	Guatemala	1	Alta Verapaz	13	Tactic		0	
94	GTM	Guatemala	1	Alta Verapaz	14	Tamahú		0	
94	GTM	Guatemala	1	Alta Verapaz	15	Tucurú		0	
94	GTM	Guatemala	2	Baja Verapaz	16	Cubulco		0	

You should see that the column 'NAME\_2' has the names of the Municipios, or the equivalent administrative unit for your country.

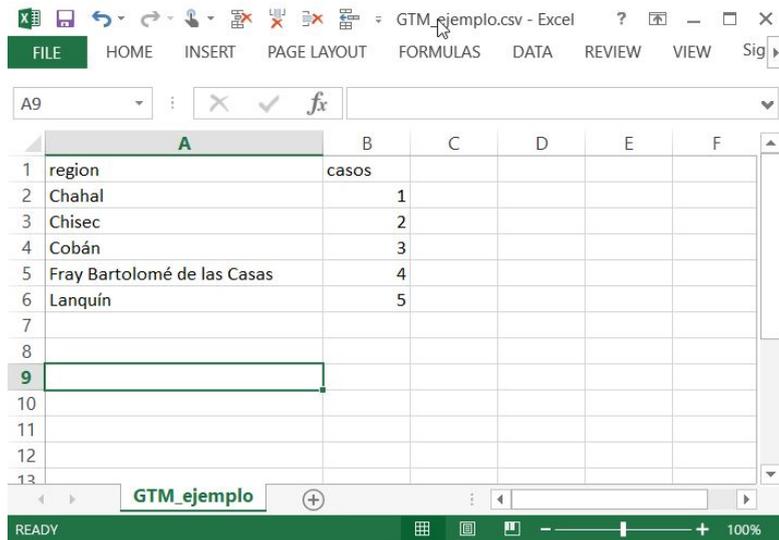
We will now look at joining municipio data from a csv onto this polygon map. This will allow you to map any area-level data that you may have. We have already shown you how to do this in Section 2.2.5 with block-level data.

We will create a very simple example spreadsheet of administrative-level case data to start.

Create a blank excel workbook and in a first column named region type the names of the first five admin areas from the attribute table you are working with.

**IMPORTANT :** you must spell the names exactly as they appear in the attribute table INCLUDING ACCENTS, and use upper or lower case letters in an identical way.

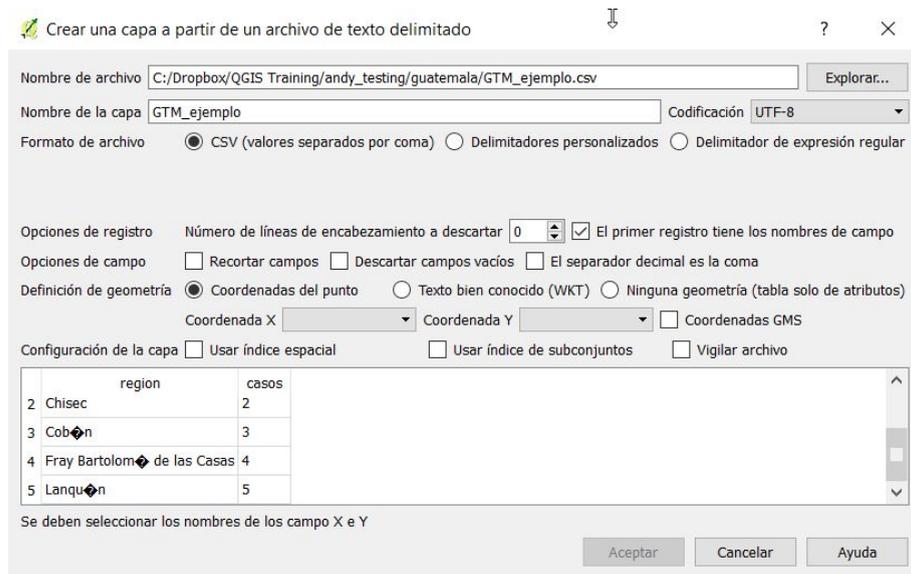
Add a 2nd column named casos with numbers from 1 to 5. Save this file **as a csv** to mi\_trabajo\datos\poligonos.



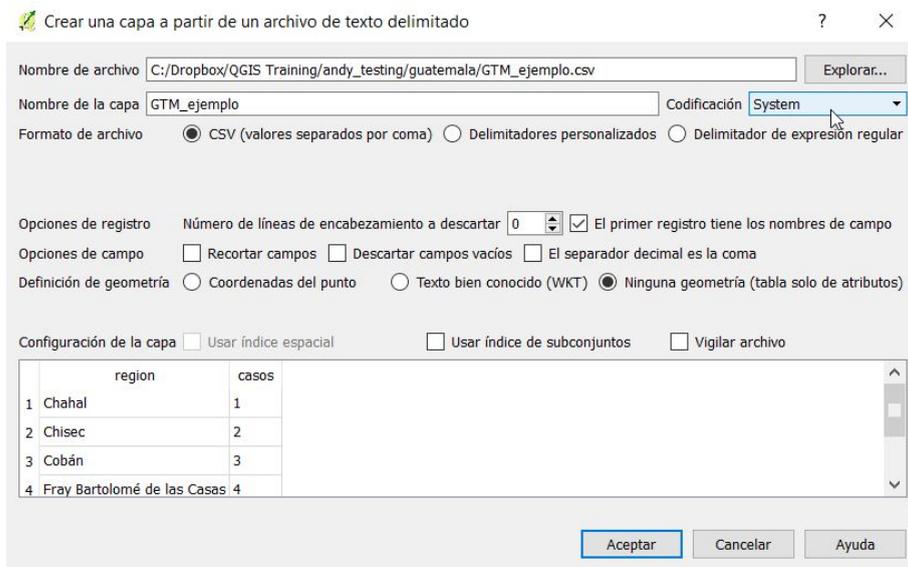
We will now join this simple file to our admin polygons. In QGIS add the csv file by clicking :  
 Capa, Anadir capa, Anadir capa de texto delimitado.

Click explorer to find your file.

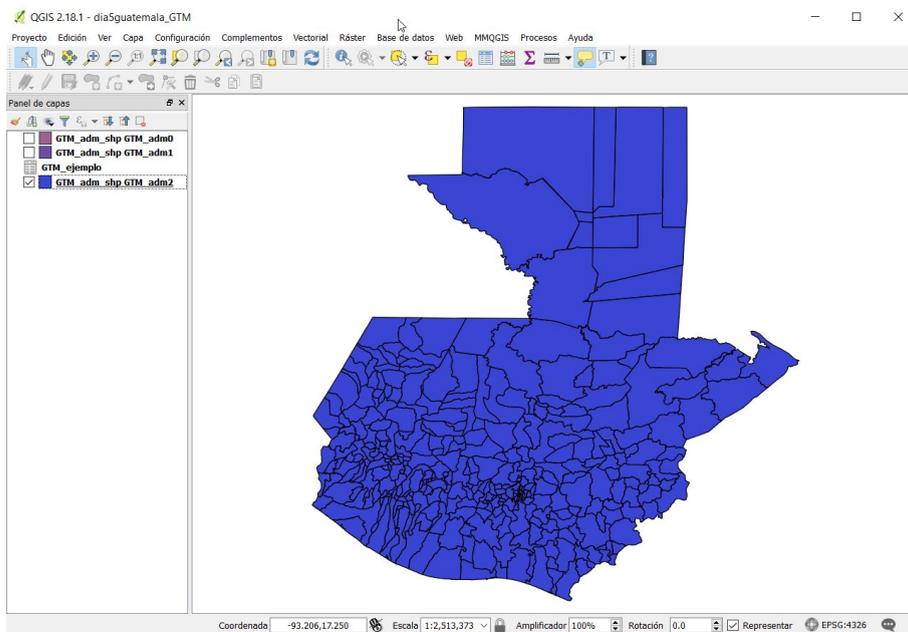
There can be difficulties in importing accents. See the question marks in the screenshot below.  
 Changing the 'Codificación' option near the top to 'System' can solve this problem.



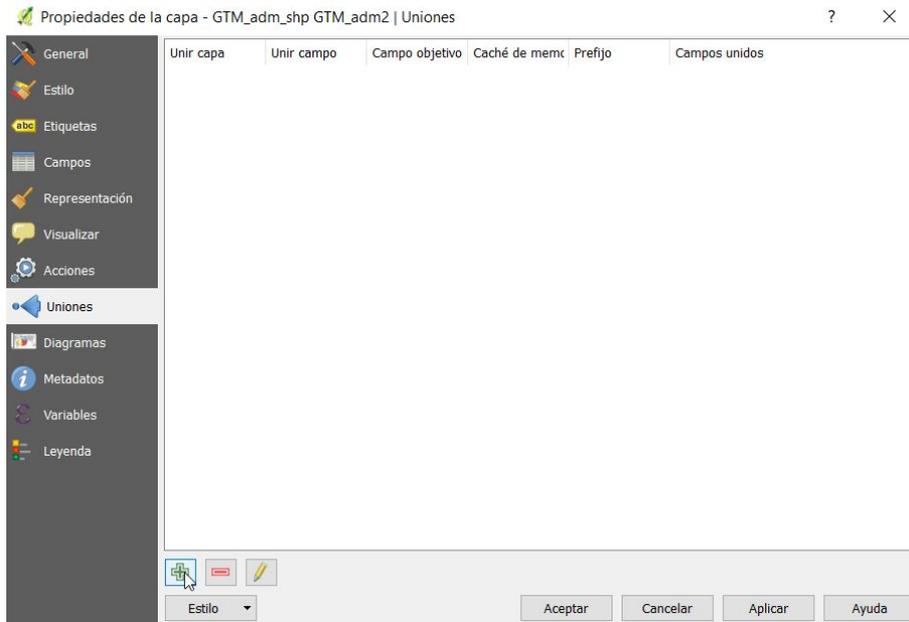
Change codificación to System and you should see that the preview shows the accents imported correctly instead of the question marks. Also remember to select 'Ninguna geometria' and click Aceptar.



The csv should now be added to the project, ready for us to join it to our shapefile.



Go to properties for the shapefile admin layer (right click) and click Uniones. Press the green + symbol to add one.



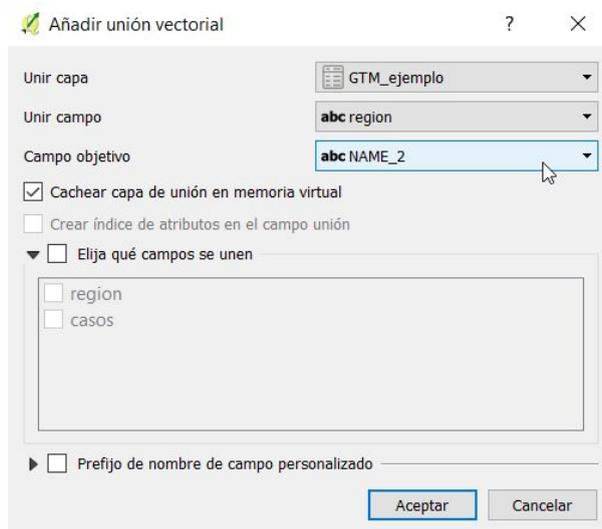
This will bring up the following window.

Set Unir capa to the name of your csv file.

Set Unir campo to the name of the column in your csv file which contains the administrative area names (e.g. 'region')

Set Campo objetivo to the name of the column in the shapefile which contains the administrative area names : 'NAME\_2'. (If you are using an admin3 layer for a different country this will be 'NAME\_3').

Leave all the other options unchanged and click Aceptar.



Open the attribute table for the admin polygon layer and you should see that your data column (1,2,3,4,5) has been joined on. If you have had any problems with accents you may see a NULL entry instead of one of the numbers. If this occurs, try checking the spelling and accents in the original csv file and repeat the steps above.

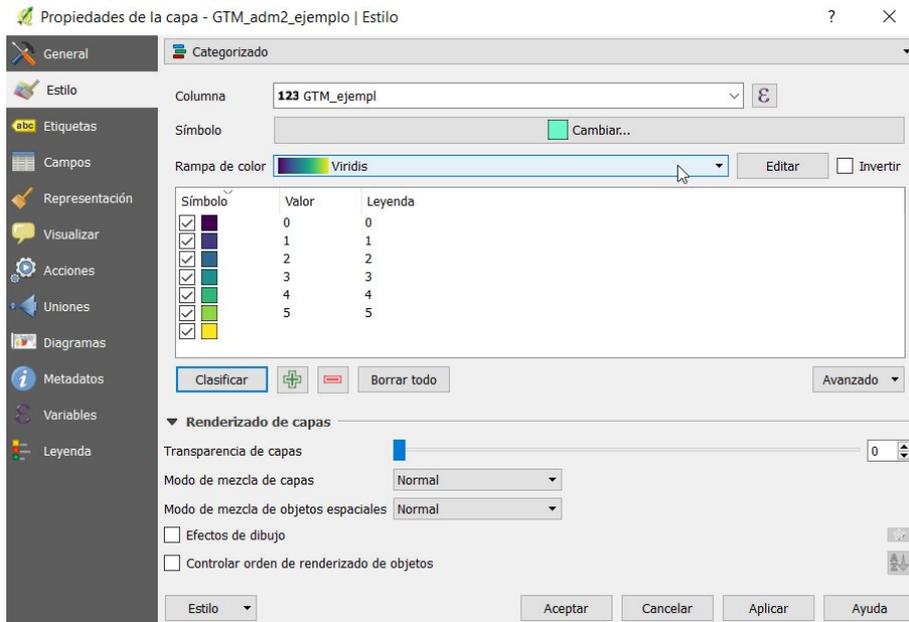
GTM\_adm\_shp GTM\_adm2 :: Objetos totales: 354, filtrados: 354, seleccionados: 0

	NAME_2	HASC_2	CCU_2	CCA_2	TYPE_2	ENGTYP_2	NL_NAME_2	VARNAME_2	M_ejemplo_cos
1	Chehal		0		Municipio	Municipality			1
2	Chisec		0		Municipio	Municipality			2
3	Cobán		0		Municipio	Municipality			3
4	Fray Bartolomé de las Casas		0		Municipio	Municipality			4
5	Lanquín		0		Municipio	Municipality			5
6	Panzós		0		Municipio	Municipality			NULL
7	San Cristóbal Verapaz		0		Municipio	Municipality			NULL
8	San Juan Chamelco		0		Municipio	Municipality			NULL
9	San Pedro Carchá		0		Municipio	Municipality			NULL
10	Santa Cruz Verapaz		0		Municipio	Municipality			NULL
11	Santa María Cahabón		0		Municipio	Municipality			NULL
12	Senahú		0		Municipio	Municipality			NULL
13	Tactic		0		Municipio	Municipality			NULL
14	Tamahú		0		Municipio	Municipality			NULL
15	Tucurú		0		Municipio	Municipality			NULL
16	Cubulco		0		Municipio	Municipality			NULL

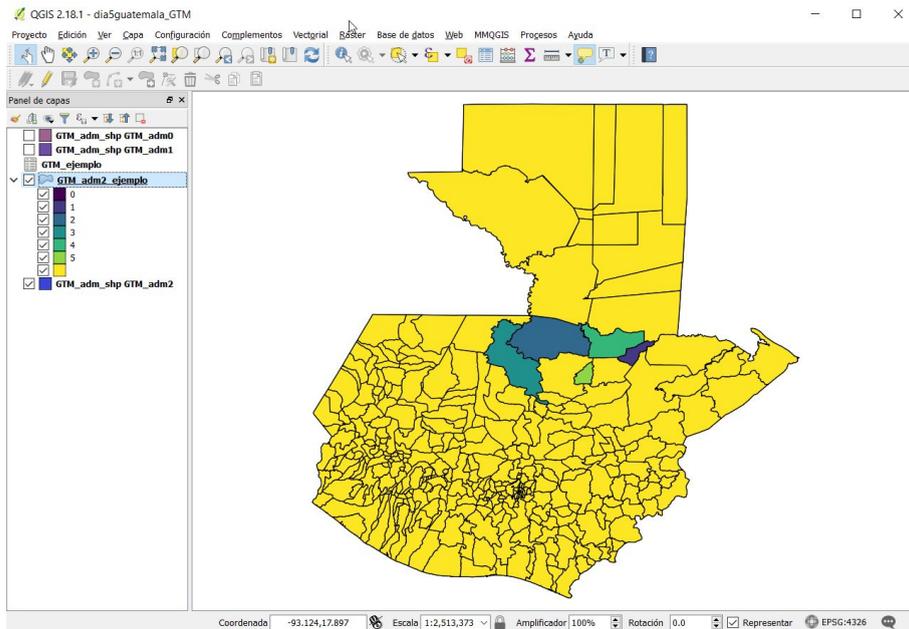
Mostrar todos los objetos espaciales

Remember that a join is temporary, and you need to save the shapefile to make the join permanent. Save the polygon layer by right clicking then 'Guardar como' and 'explorar' to find the folder mi\_trabajo\datos\poligonos.

We can now use the new column to create an area-level map of cases. Right click on the layer, go to Propiedades, Estilo. Change to Categorizado at the top, and change the column to the newly added column. Here I've also set the 'Rampa de color' to Viridis which is one of my favourites. Press clasificar and then Aceptar.



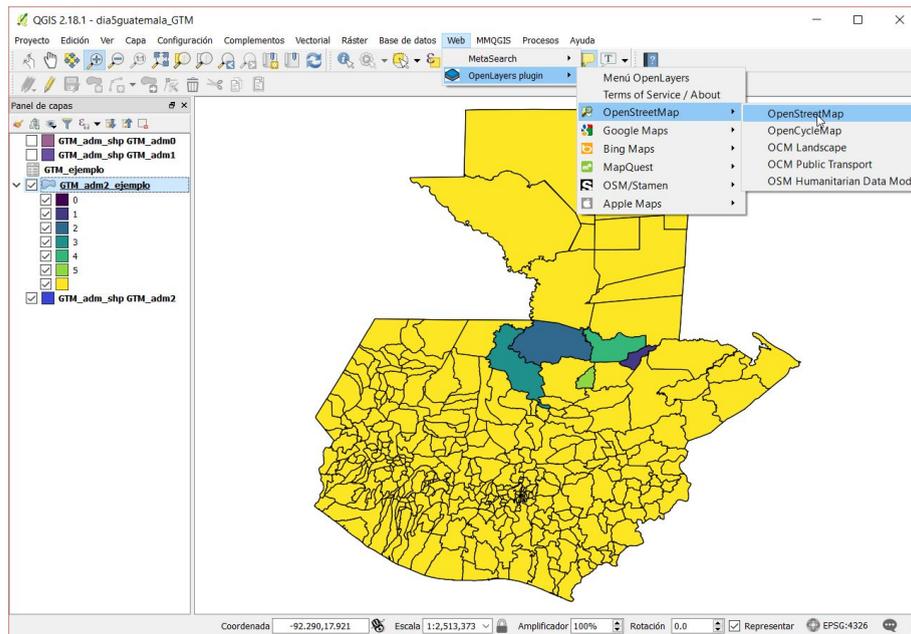
You should now be able to see that the administrative areas are coloured according to the number of cases you have assigned it.



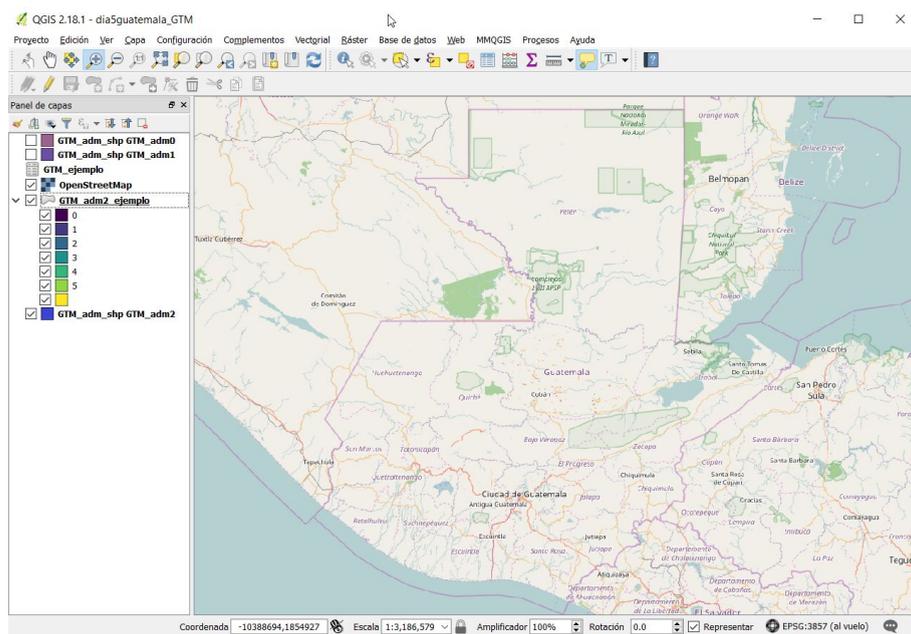
## 5.2 Using OpenStreetMap street data

We will now look at adding some other potentially useful data from OpenStreetMap i.e. street names.

We covered this in section 4.2.1, and we now encourage you to download some OpenStreetMap data for your own country. Add a OpenStreetMaps basemap to your project as we have done previously (e.g. Section 1.7).

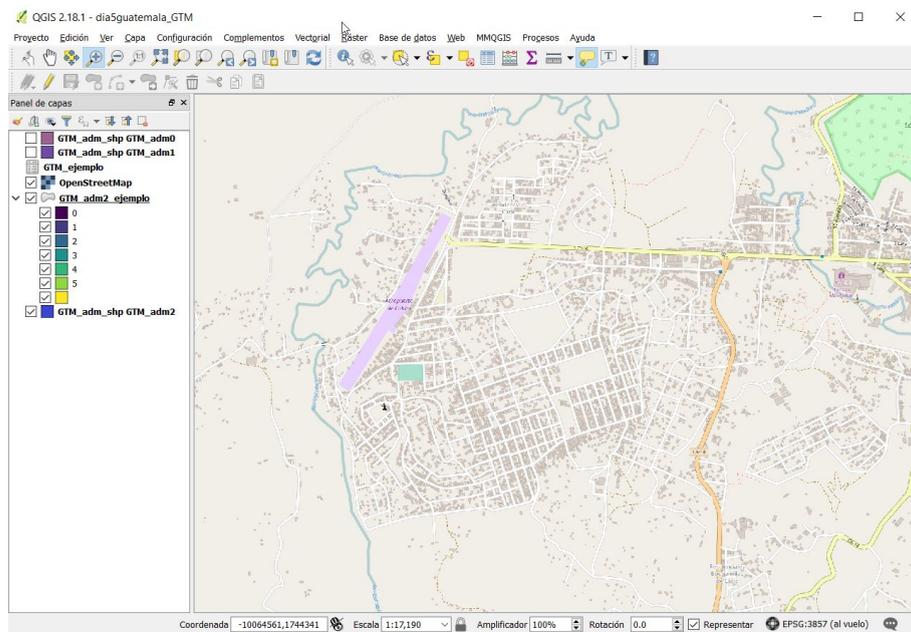


The OpenStreetMap layer should look something like this for the large area of the whole of Guatemala.

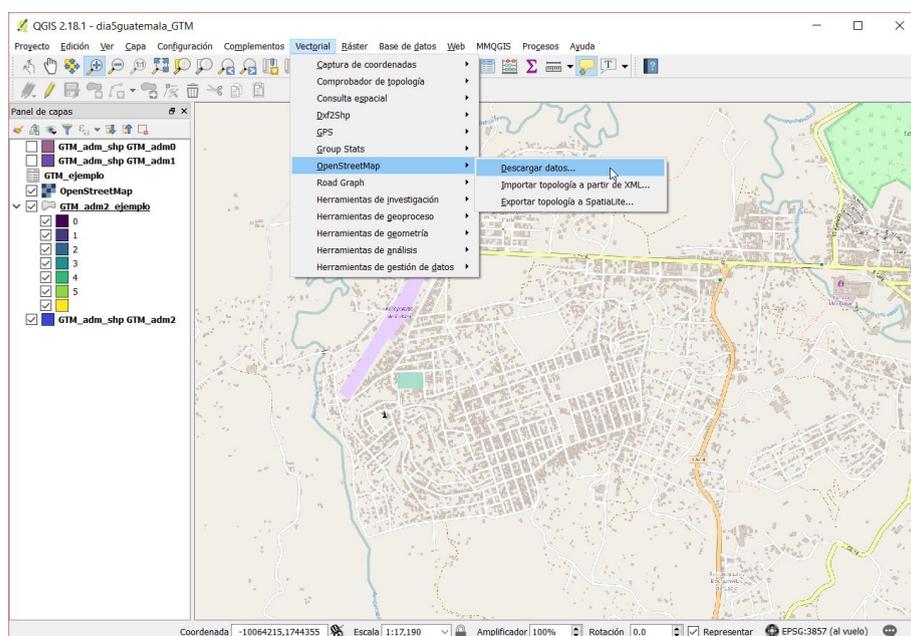


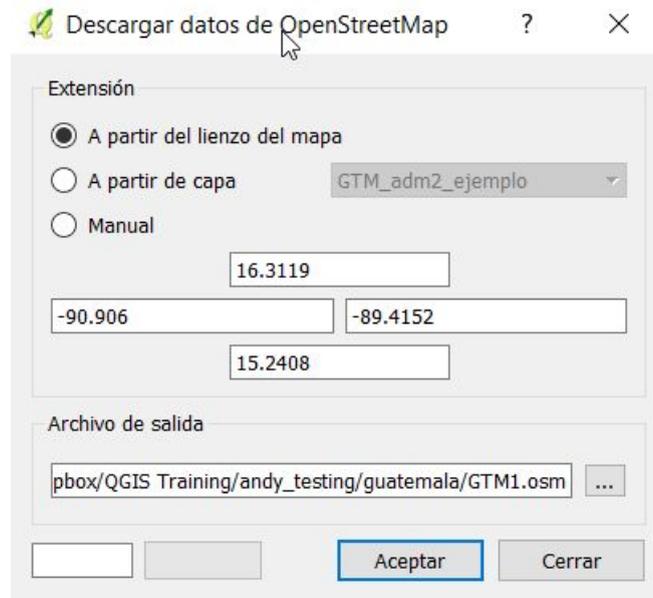
Zoom in on a part of the country you are interested in. Keep the area fairly small, e.g. so that you can see individual streets, to avoid slow downloads and a large file. If you have problems try zooming in to a smaller area.

Here we zoomed into a city named Coban :



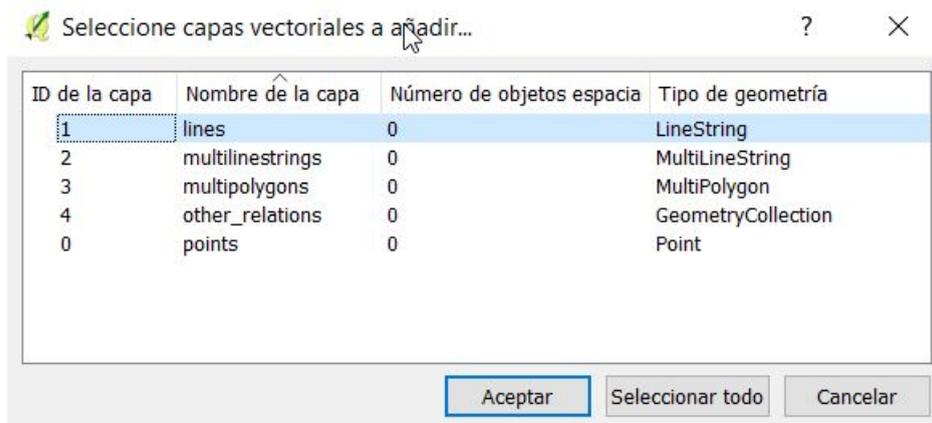
Click Vectorial, OpenStreetMap, Descargar datos



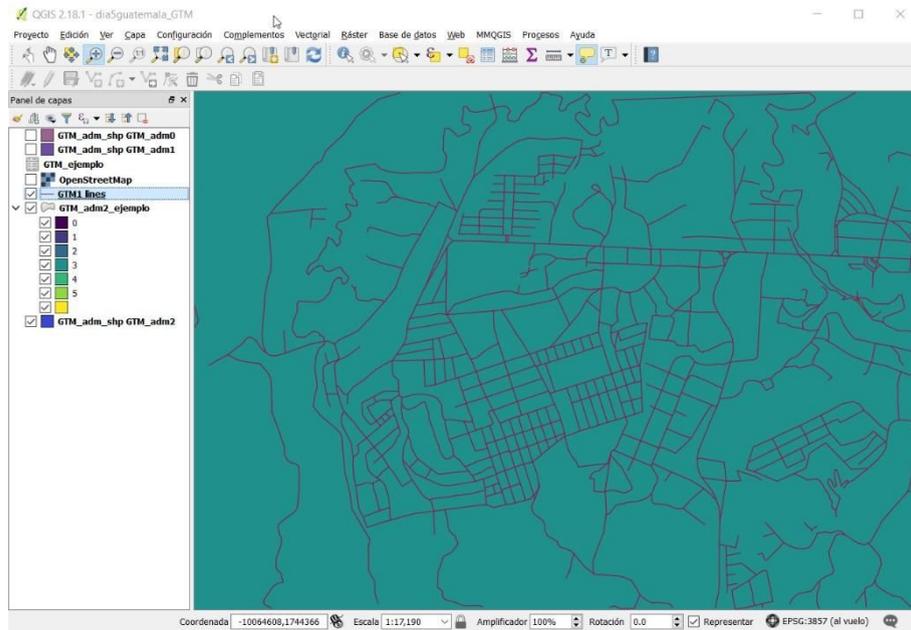


When you get a message saying success. Press Cerrar to close the window. Click, Capa, Anadir capa, Capa vectorial and explorar to find the OSM file. Click Abrir.

It will ask you which layers to add. As we only want to add Street data to our maps, Select the first row i.e. 'lines'.

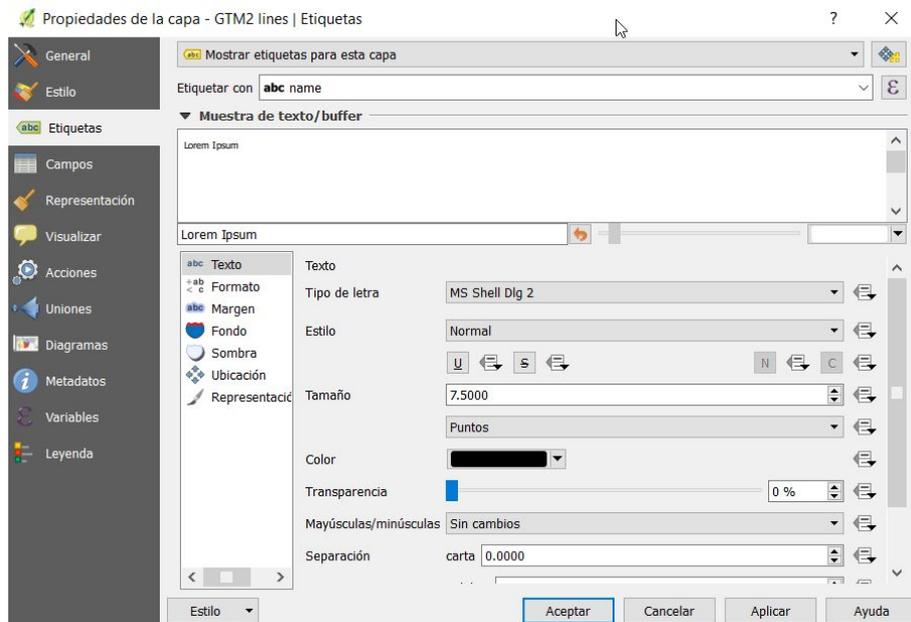


You should see streets added to your map. It may come in below the OpenStreetMap web layer, in which case untick that one so that you can see the streets :



We can label the streets using Propiedades, Etiquetas.

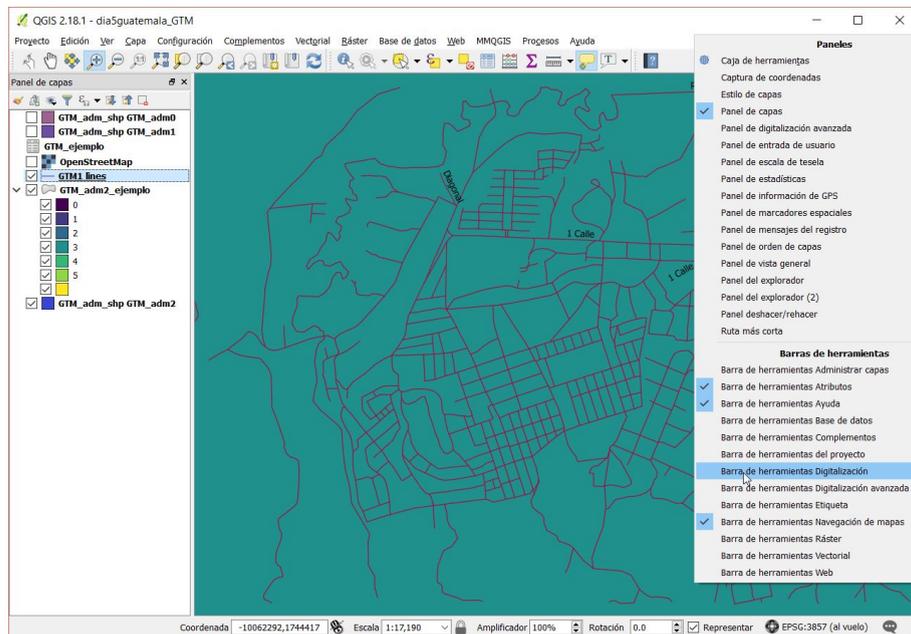
Change to 'Mostrar etiquetas para esta capa'  
and Etiquetar con : 'name'



Recall that OpenStreetMaps is created by volunteers, and as such some áreas will be more detailed than others. For example, urban áreas are often more complete than rural áreas. In the example below, only some of the streets been assigned names, but this spatial data can still help us to determine where to add points (e.g. maybe the locations of egg traps) to our maps.

Now we will prepare to add some of our own points to the map using on-screen digitizing which we introduced earlier in the week in Section 3.3.3.

To do this we can turn on the digitizing toolbar if it is not already activated. Right-click in the menu bar and click on the box to the left of Digitizing Toolbar.

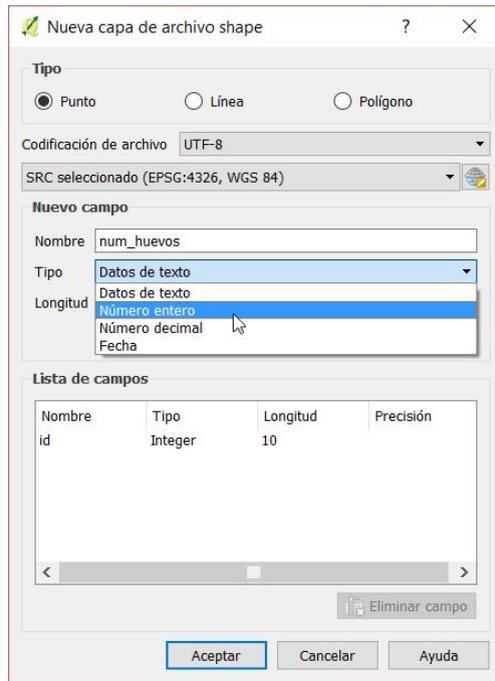


This should add these tools to your QGIS toolbar. Note how currently most of them are greyed out.



We will create a new points layer that we can digitize points into and will add a column called num\_huevos imagining that we have some egg trap data to map.

Click Layer, create layer, new shapefile layer and you should see the window below. In the New field section we will add an extra column by typing num\_huevo s for Name and selecting Whole number for Type.



Click 'Add to fields list' then OK. We could also add a date column here.

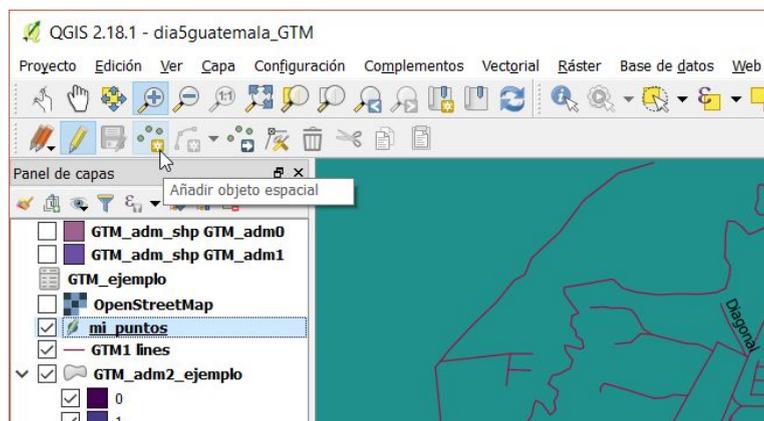
QGIS will prompt you for a name and where to save the new points shapefile. Save it in your mi\_trabajo/datos/puntos folder.

Make sure that you have the new points layer selected in the layers panel and then click the single pencil icon in the Digitising toolbar.

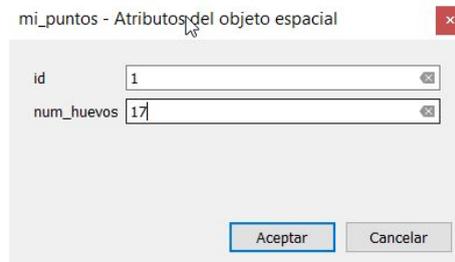


This turns on editing.

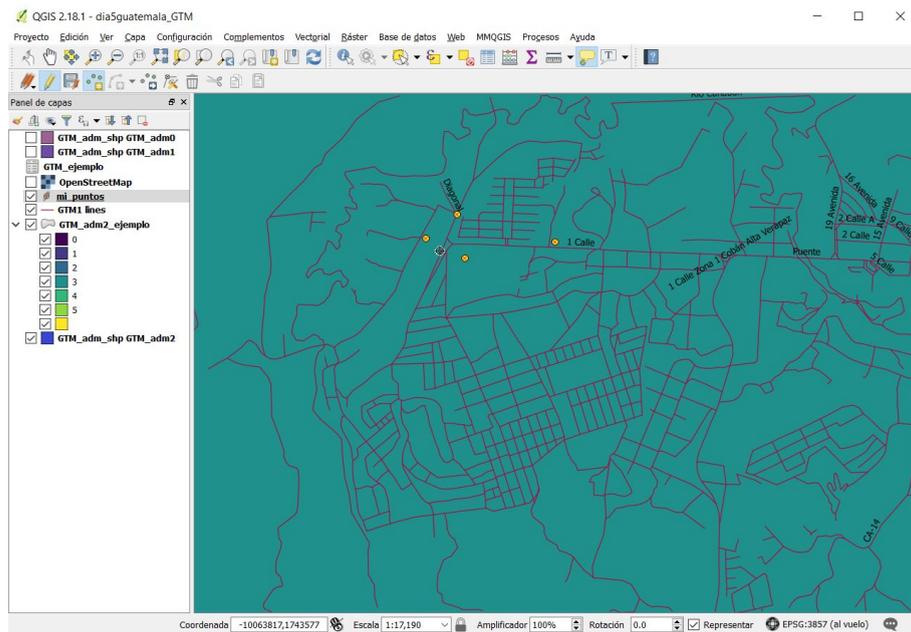
Now click on the icon with 3 dots to add a feature:



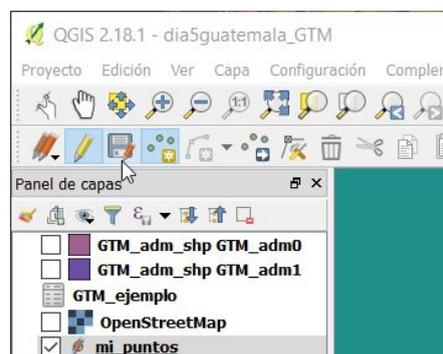
Click on the map in a place where you would like to add a point (e.g. this could be the location of a house where an ovitrap has been placed). QGIS will prompt you for attribute data associated with this point:



Enter values and press OK you will see a point added to the map. Repeat the process a few times to add further points to the map:



Press the disk symbol to save layer edits:



Here we have seen how we can use some GADM data for administrative boundaries and OpenStreetMap data for roads to help us enter our own data.

### Exercise 5.1

Prepare two maps showing how you have used (a) GADM and (b) OpenStreetMap data for an area of your own country.

### Exercise 5.2

Prepare a map for an area of your own country using data you have brought with you or created here.

We will be asking you to present the maps you have made to the rest of the group.