# Getting Started with QGIS

QGIS will be familiar to the software you already know in some ways: There is a main work area, a layers palette, and a file browser. In this lesson, we'll create a simple map to acquaint you with the basics of QGIS and prepare you for the upcoming tutorials.

Setting up QGIS

1. Open QGIS. You should see something like the image below. You can arrange the palettes any way you want; the most important ones are the **File Browser** and the **Layers** palette. This is how I do it:
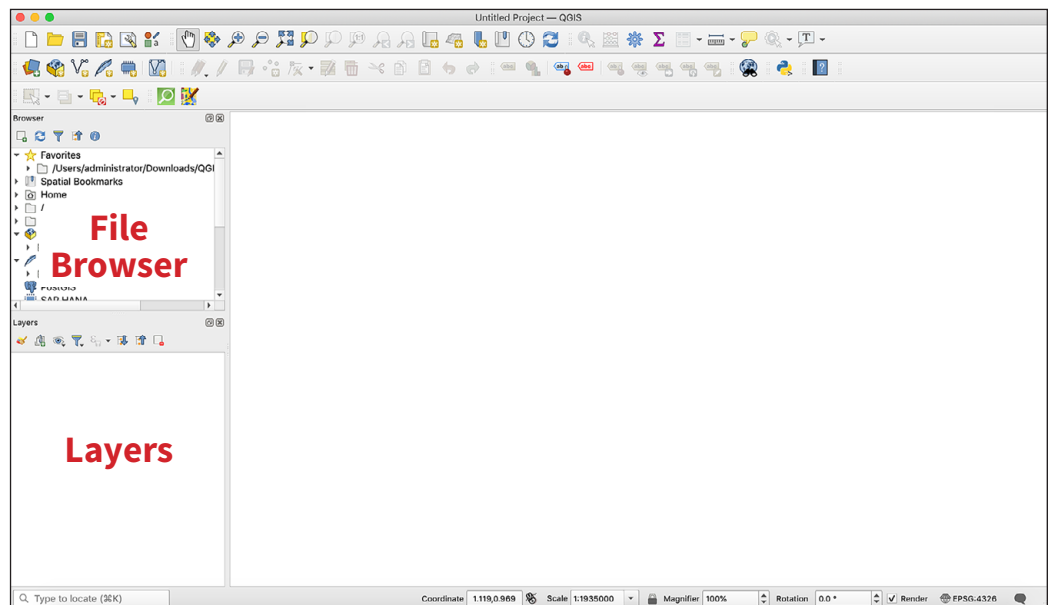

If your screen looks like this, go up to the **Project** menu and select **New**.
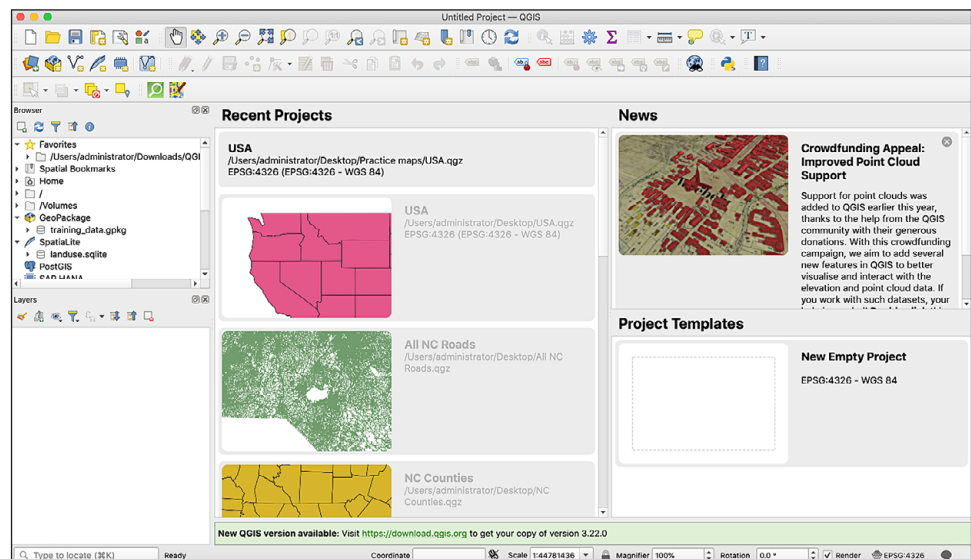
2. We'll be spending a lot of time in QGIS, so let's go over the interface. First of all, don't worry about all of the buttons at the top—we will ignore most of them. There are three main areas:
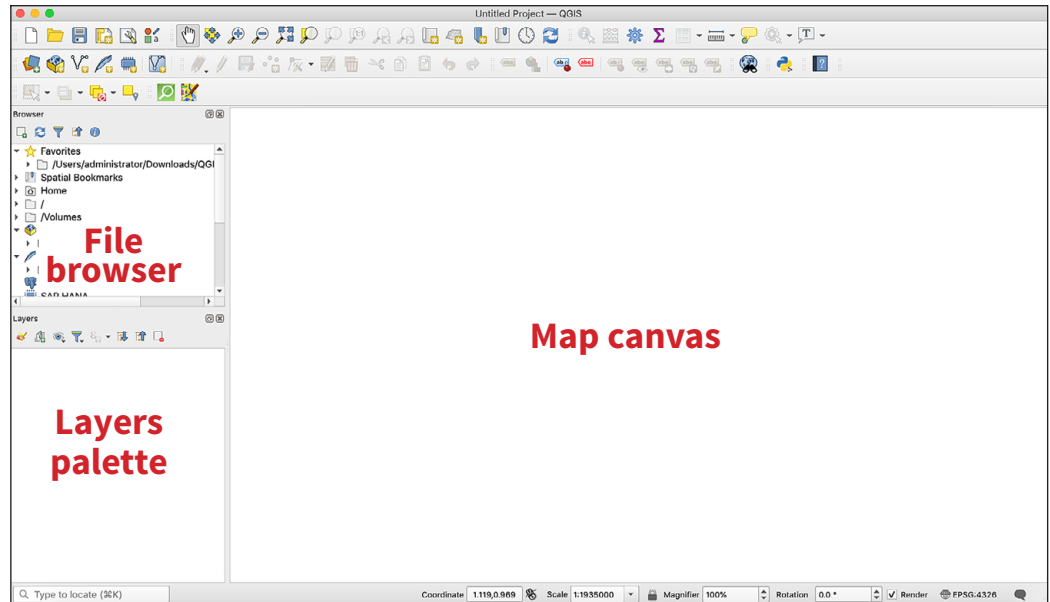

- The **map canvas** (the big empty area). This is where we'll build our map. Just like the software you're used to, you can zoom in and out using the scrolling wheel of your mouse (or buttons or keyboard shortcuts) and also move the image around with the hand tool.

- The **file browser**. This is where you will navigate around your computer to find the files you need.

- The **layers palette**. Here you'll see the layers in your project and reorder them by clicking and dragging, just as you're used to doing in other software.

3. In this Guide, I'll refer to menu commands by the path, such as **Raster > Analysis > Hillshade**. I include screen shots of this in most cases.

4. There's one more thing we need to do before we begin. Like most software, QGIS can be customized to work the way you want it to. There's an important setting we need to check. Go to the menu at the top of the window and select **Settings > Options**. The **Options** window will appear. Click on the **CRS** tab and check these boxes, then click OK. Now we're ready to add some data.
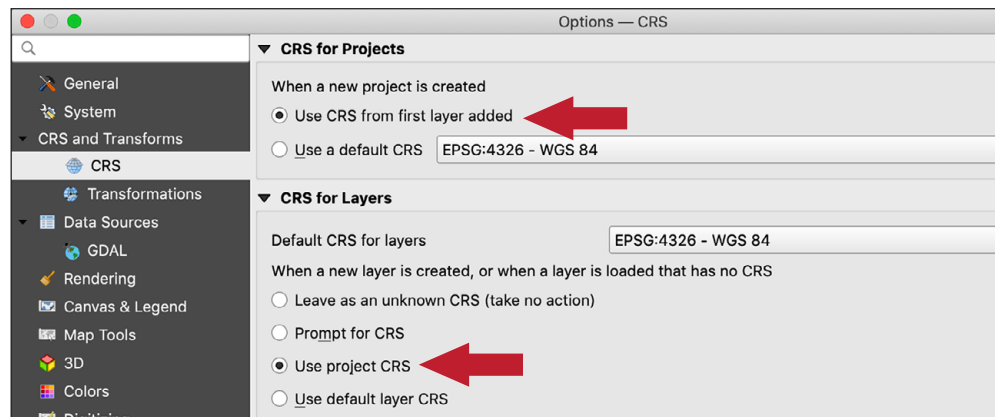
Adding data

Since our map will be created from GIS data, we need to get that data into QGIS first. There are several ways to do this, but one is much easier and usually the only way I do it. In the QGIS interface, make sure the **Browser** and **Layer** palettes are checked and visible. If they aren't, go to **View > Panels >** to activate them.

1. If you haven't already done so, download the **Getting Started file** and unzip it.

2. In the Layers palette, you'll see a folder with a slash. This is your computer's primary drive. Click the little triangle to open it.
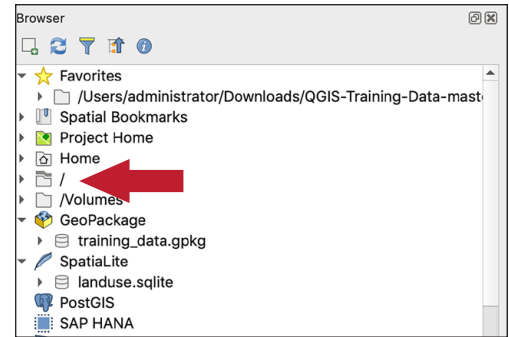
3. You'll see a file structure. Yours will look different from mine, but you will use this to navigate around your computer to find the data files you've downloaded.
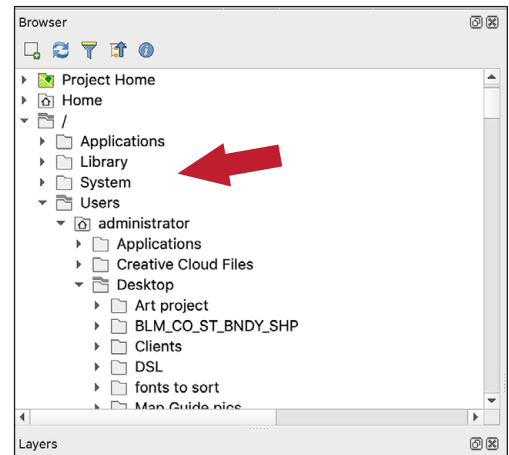
4. Here I've opened the QGIS Getting Started folder to show several folders inside. I've opened the **ne_50m_admin_0_countries** folder by clicking the little triangle.
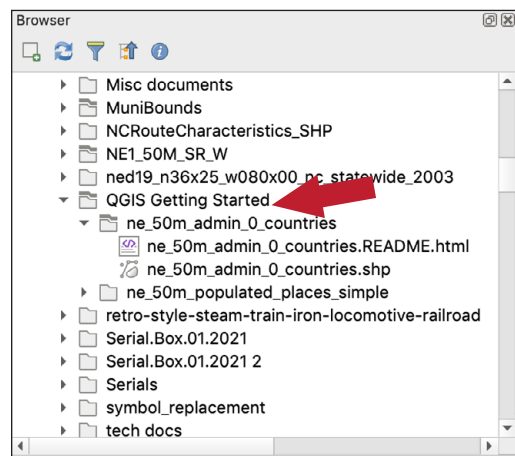
5. You can see several files here, but only one that ends in **.shp**. This is a **shapefile**; one of the most common GIS data formats. We'll be working mostly with shapefiles; most of the maps I create are made up entirely of them. Shapefiles contain vector data—borders, cities, roads—the kind of information most maps need to show.

6. Now that we have our data ready, we can start using it to build a map. We'll start by adding the country borders file (**ne_50m_admin_0_countries.shp**). Click on this file in the Browser window and drag it onto the map canvas (the main window). You'll see something like this (see next page):
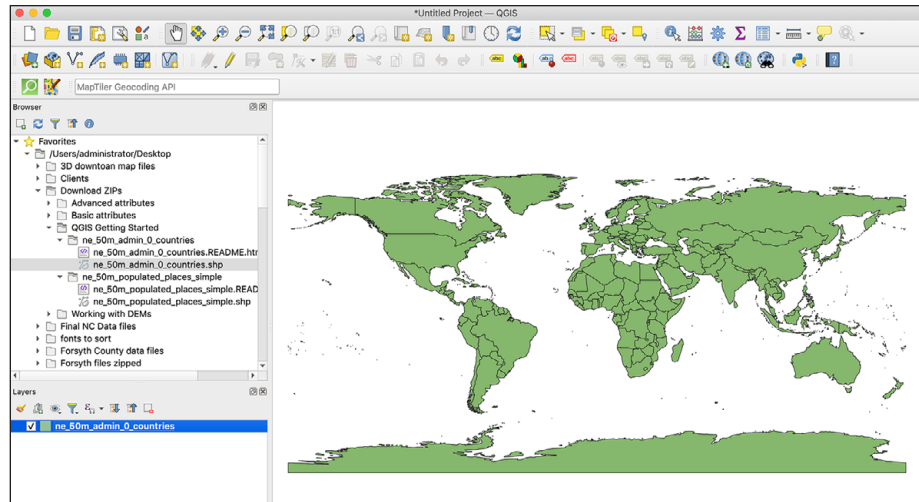
7. Congratulations—you just created your first GIS map. That wasn't scary, was it? There are other ways to get data into your map, but dragging the layers onto the map canvas is quick and easy; unless you need to do something advanced, it's the best way to do it. You can also drag them into the Layers palette if you prefer.

   QGIS assigns a random color to the map. Don't worry about that; we'll change the color later.

8. You'll also notice the new layer in the Layers palette. This works just like layers in other graphic software; you can turn the layer on or off by using the checkbox. You can also rearrange the order of layers by clicking and dragging them. If you want to delete a layer, click on it once to select it and click on the **Remove Layer/Group** icon (the last one on the right just above the layer list).

   The borders layer is polygon data. Polygons in QGIS work just like closed paths in Illustrator—they have a stroke and fill. Before we proceed, let's rename the layer to something easier to understand. Right-click on the layer in the Layers palette and select **Rename Layer**, then type the new name. I'll call it **Country borders**.

9. Let's add another layer to show cities. Open the **ne_50m_populated_places_simple** folder and drag the shapefile onto the map canvas. Here's what we see:
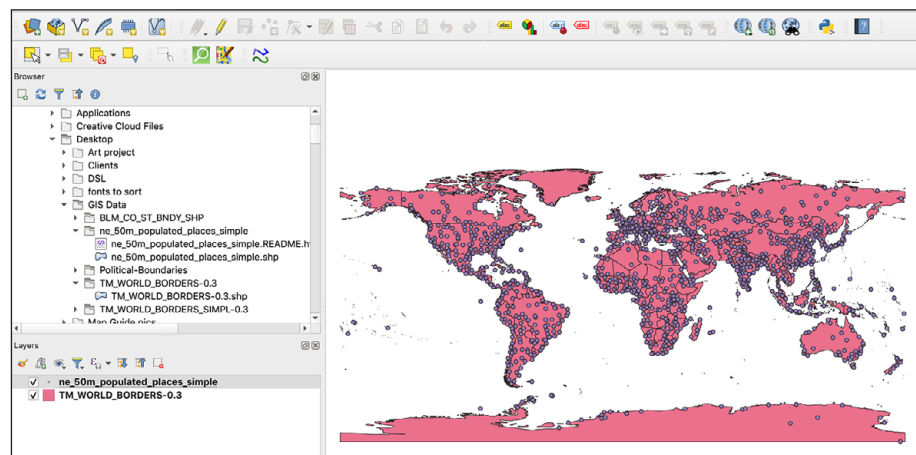
Now we have cities on the map. If you zoom in, you can see them more clearly:
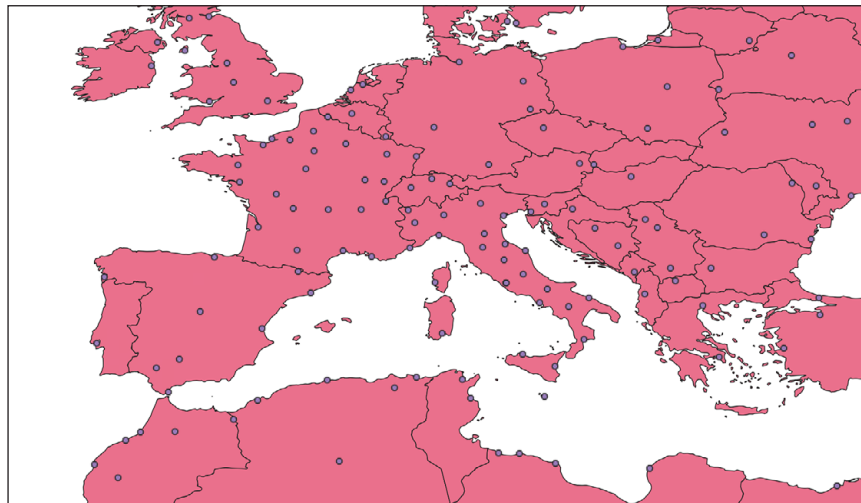

You see the cities because the new layer is above the first layer. If you move the world borders layer above the cities layer, the cities will disappear. This is just like what you'd expect in other graphic software. Rename this layer **Cities**.

Now that our data is in place, we'll change our map's appearance.

Styling the map

Now we'll change the map's appearance. That pink color I've got is pretty ugly (you probably have another equally ugly color), so I want to change it. I'd also like to change the symbol for the cities. We'll use the **Layer Properties** feature to do this.

1. We'll work on the country borders layer first. Double-click on the layer name to open the **Layer Properties** window. On the left side you'll see some tabs. These control different aspects of your map. We'll only be using two of these: **Symbology** and **Labels**. Click on the **Symbology** tab and you'll see this:
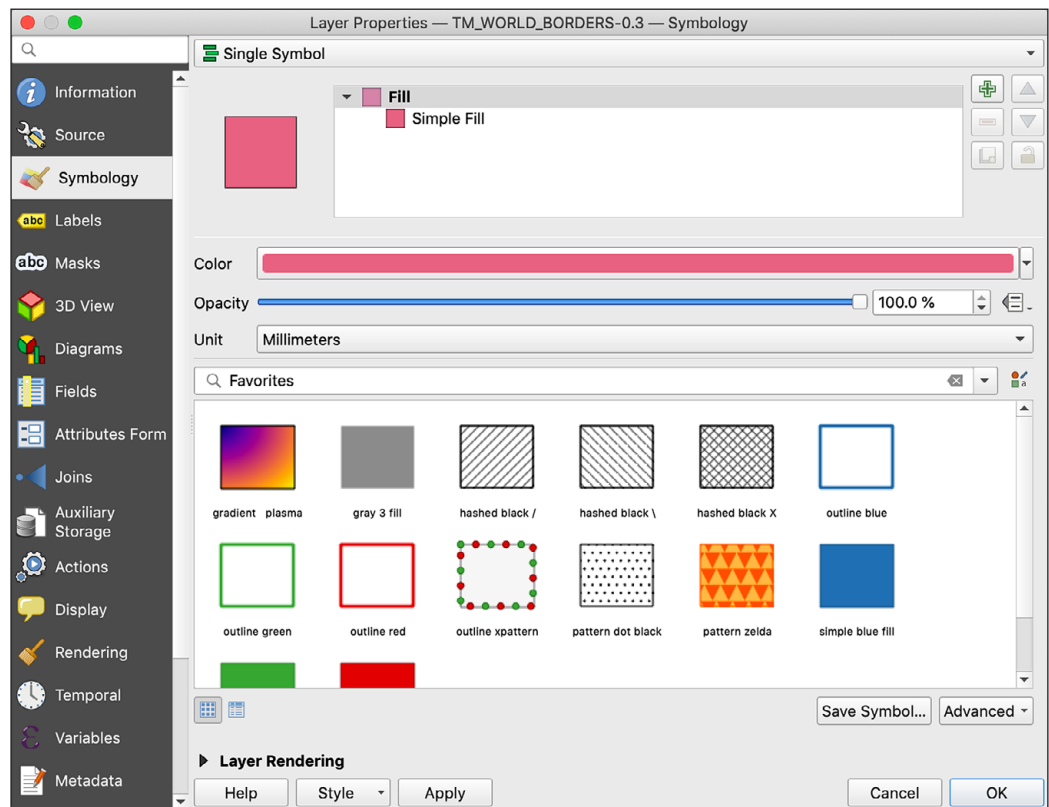

Symbology is where we control the visual appearance of the layer. The initial screen shown above contains some quick options, including some presets. To try one of these, click on it and click on the **Apply** button. This changes the map but keeps the Properties window open.

I don't like any of the presets, so I'll set the color manually. If you click anywhere on the Color bar, a color picker will appear.

You have a choice of color pickers; you can also enter RBG values or a hex code. Pick a color you like, then click OK. I chose a light yellow (see next page):
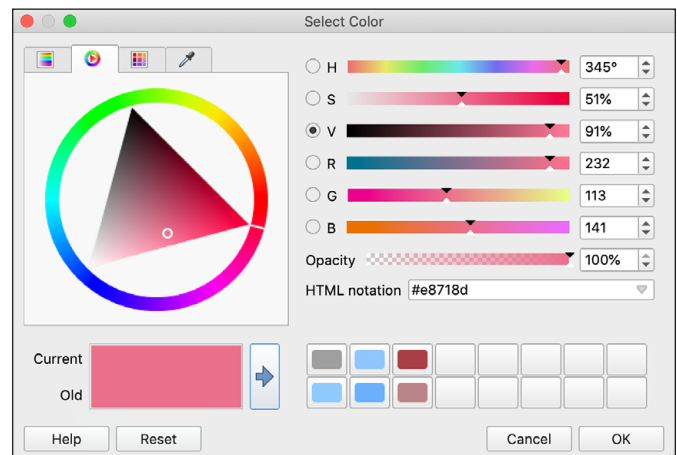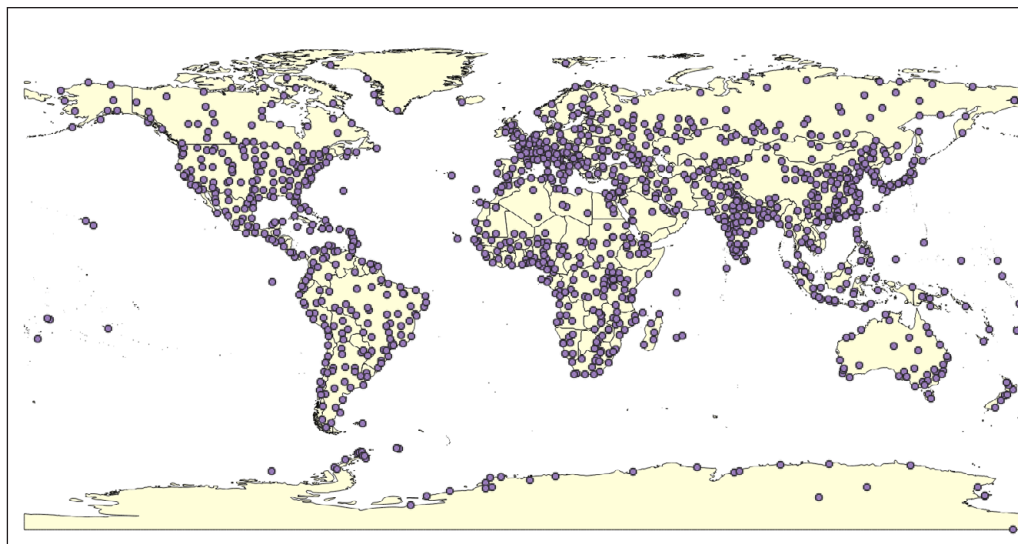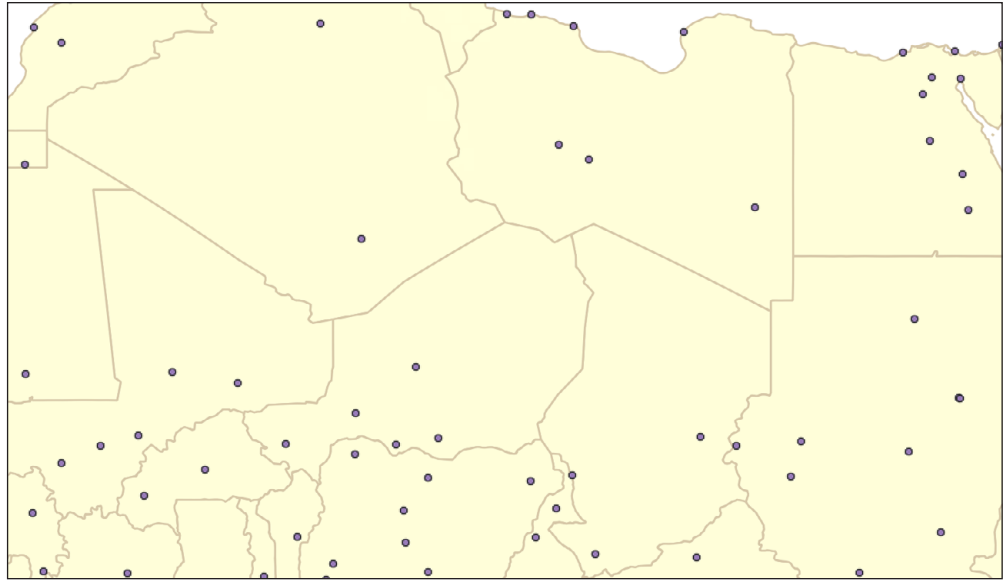
2. You can also control the stroke color and width of objects. To do this, open the **Layer Properties** window. At the top, click on **Simple Fill** and some options will appear.
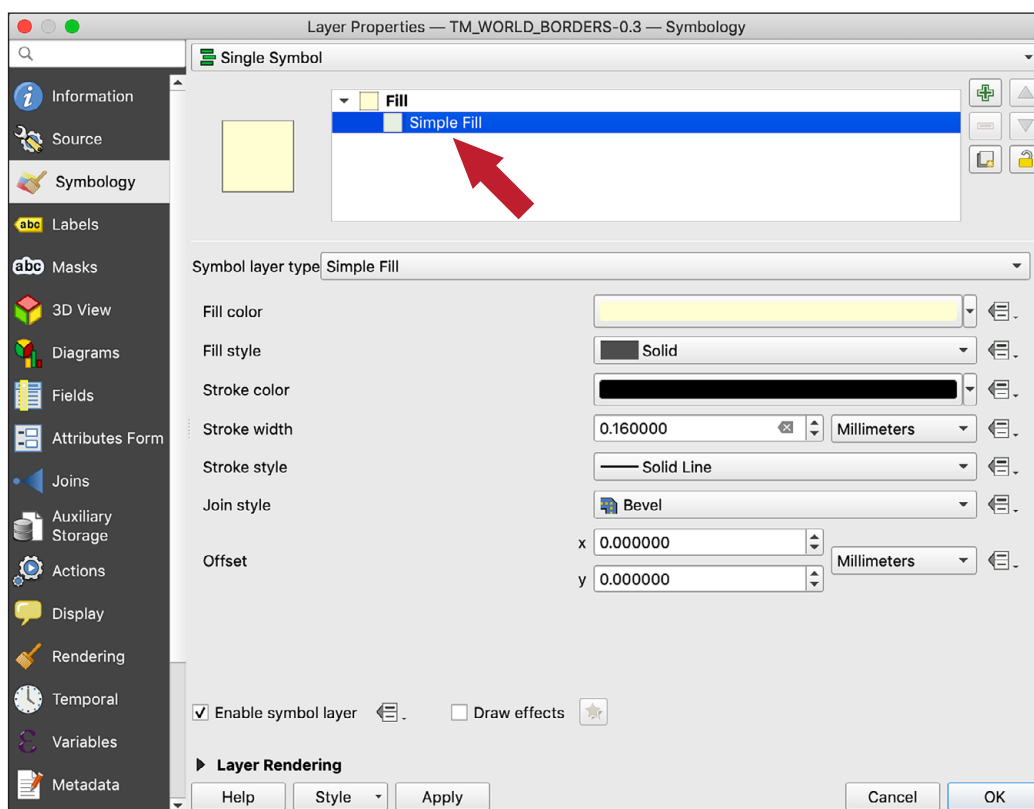
3. Now you can control the stroke and fill of the layer separately. I'll change the stroke color to a medium brown and increase the stroke weight (see next page):

4. Looks good. Now we'll turn to the cities. When I zoom out, the cities look too big; I'd like to make them smaller and a different color.
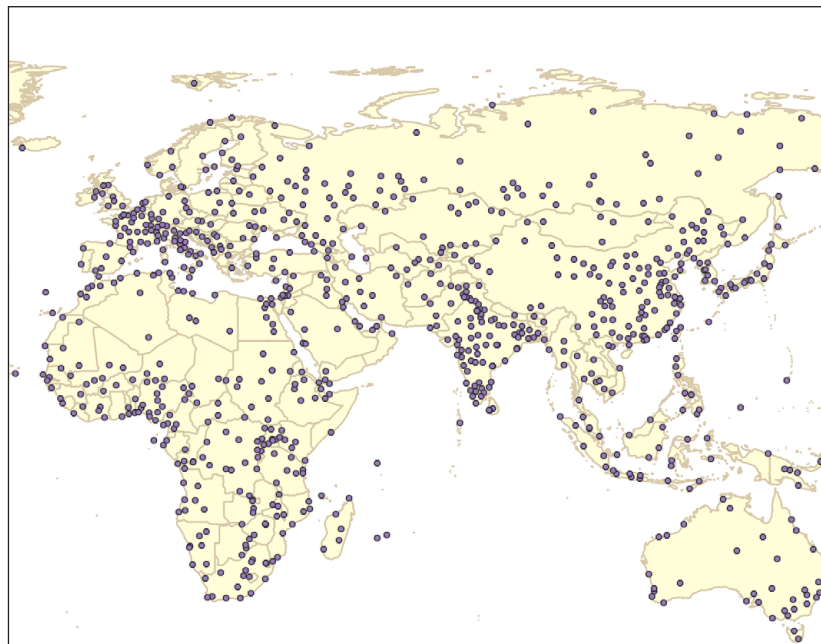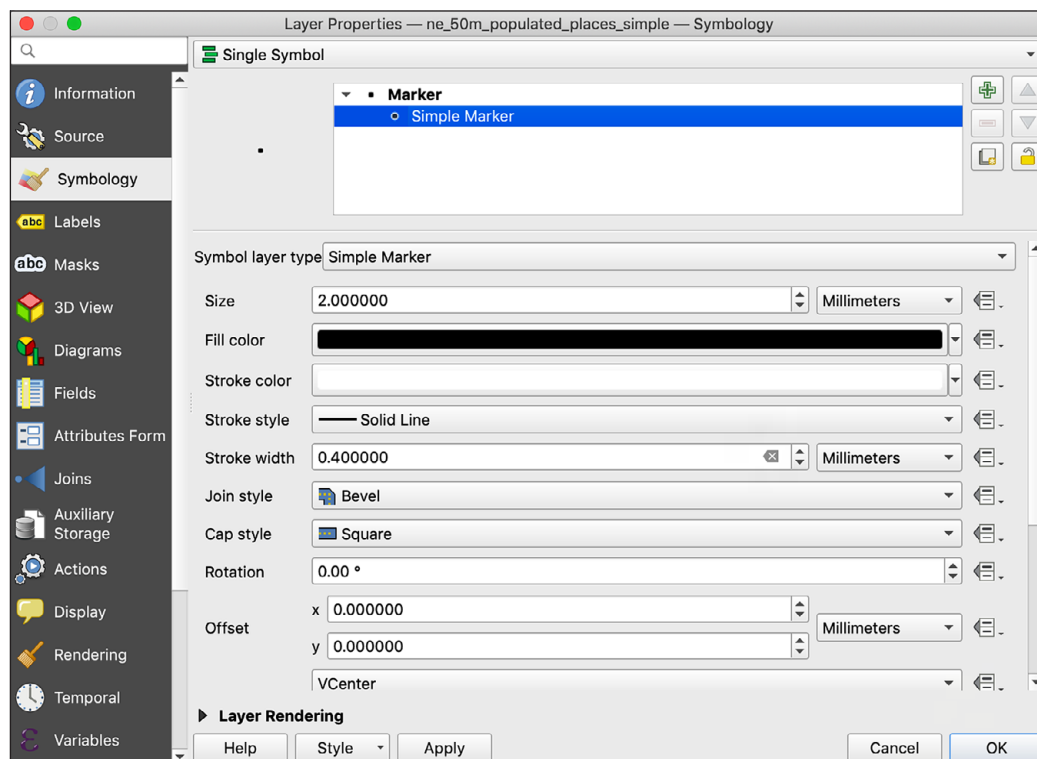

5. Double-click on the cities layer to open the **Layer Properties** window (if it's not still open from the last step).

The cities are point data. Like polygons, they can have a fill and stroke. You can see some presets here; each of these can be customized. Try a few of them and click **Apply** to see how they look.
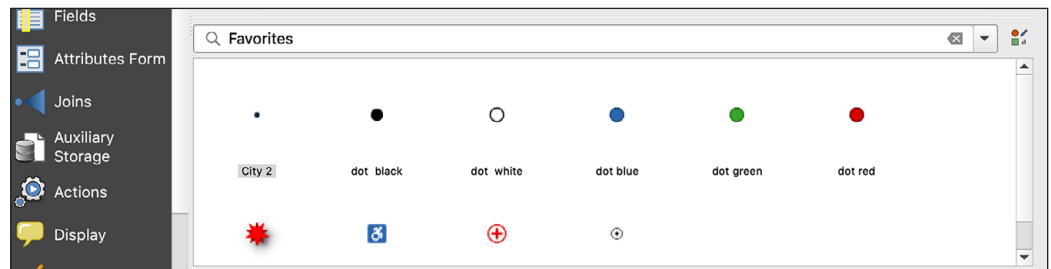
6. To access more controls (including separate stroke and fill controls), click on **Simple Marker** at the top and you'll see this window:

Here you can control all aspects of the marker's appearance. I chose the small black dot and set the size at 1.5 mm:
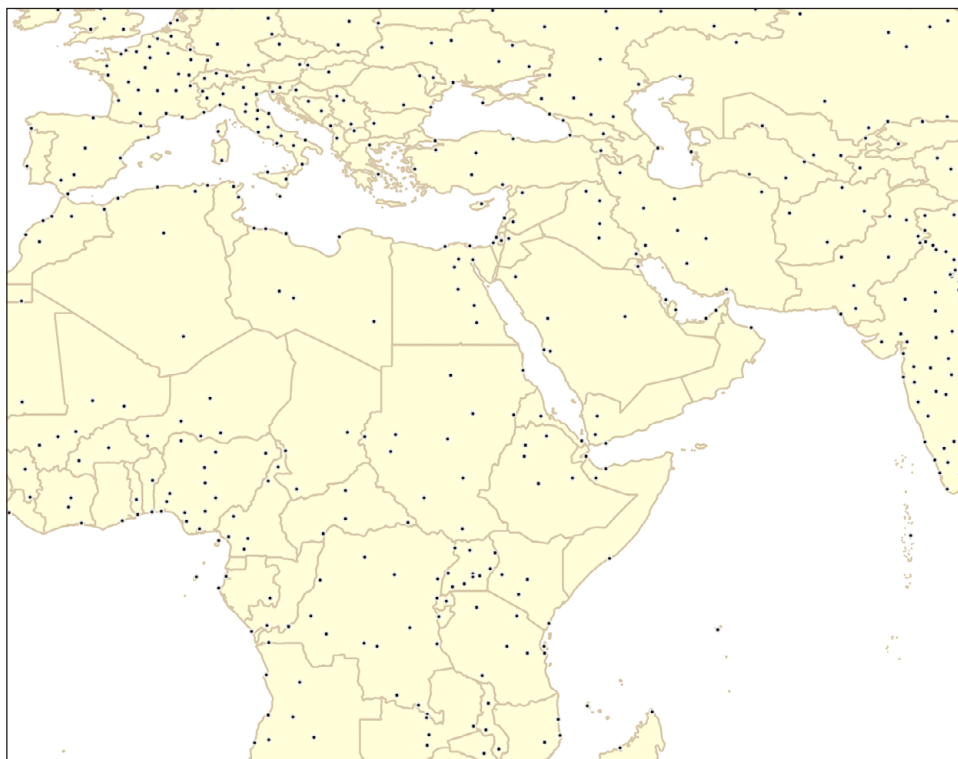
7. Now we can add labels to our cities. Double-click on the city layer to open the **Layer Properties** window (unless it's already open) and select the **Labels** tab. At the top of the window, click on **No Labels** and select **Single Labels**. You'll see this:
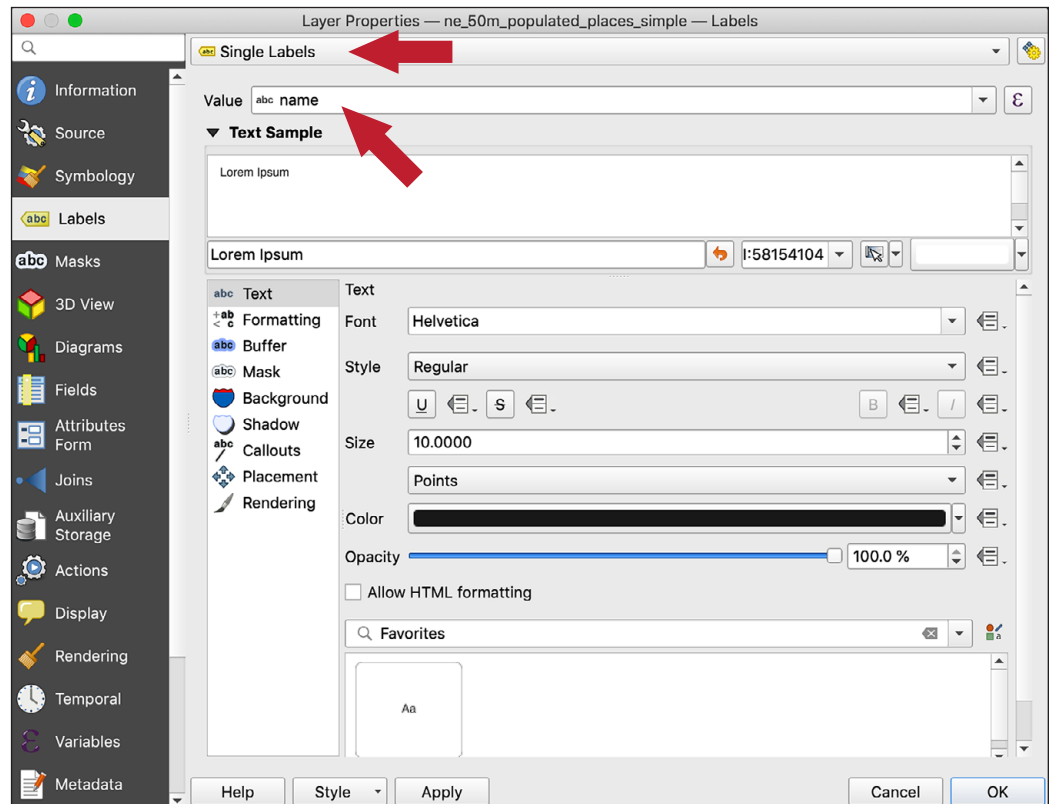

8. Here we can control the appearance of our labels, but before we can do that, we need to tell QGIS which field in our data contains the country names. Pull down the menu for the **Value** field and you'll see the different categories we can choose from. These categories are called attributes, and we'll talk more about them later. For this data set, the data category we want is called **NAME**. Select that and click **Apply**, and you'll see this:

Every city is now labeled, but it looks pretty busy. Zoom in and see what happens:
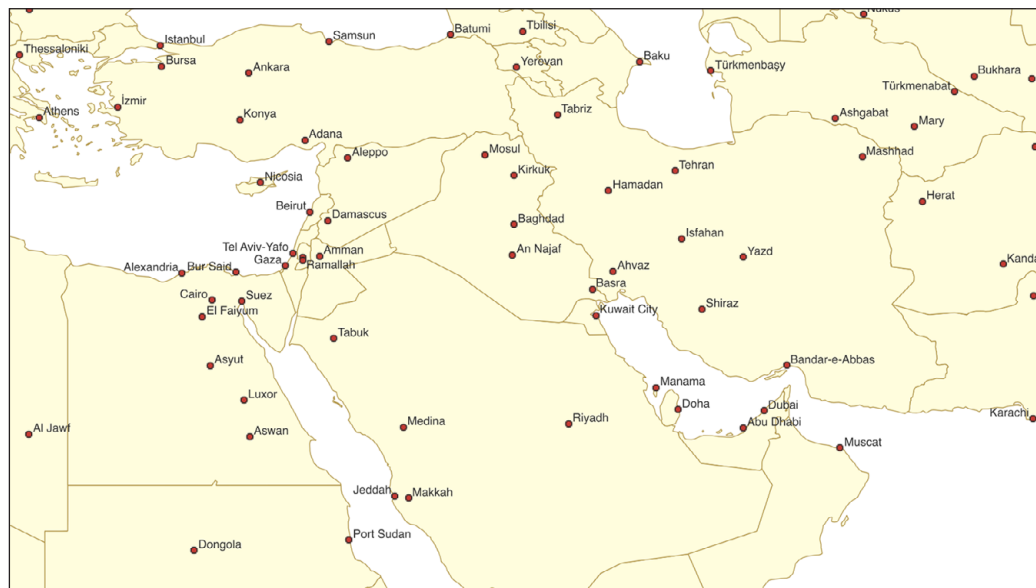
Each time you zoom in, the labels look smaller. What's going on here? QGIS automatically sizes the labels to fit the view of the map you're currently using. We'll talk more about this in the next step.

There's a lot more we can do in QGIS to improve the appearance of our map, but for now we'll consider this one finished. Next, we'll export it from QGIS so we can open it in Illustrator.

Exporting to Illustrator

Now that we're done with the QGIS steps, we can move our map into Illustrator (or some other vector software) to add some finishing touches. QGIS can export maps in several different formats, but we'll use SVG (see the **Exporting** chapter for a complete discussion of this topic).

Exporting as an SVG

1. While you're still in the main map window, make sure to turn on all of the layers you want to export. You can export the entire map or just part of it. Whatever is visible on the map canvas will be what gets exported. To show the entire map, either zoom in or out so the entire map is visible, or click on the biggest layer (usually the area boundary layer) and go to **View > Zoom to Layer**. For this exercise, I'll zoom in to Europe.
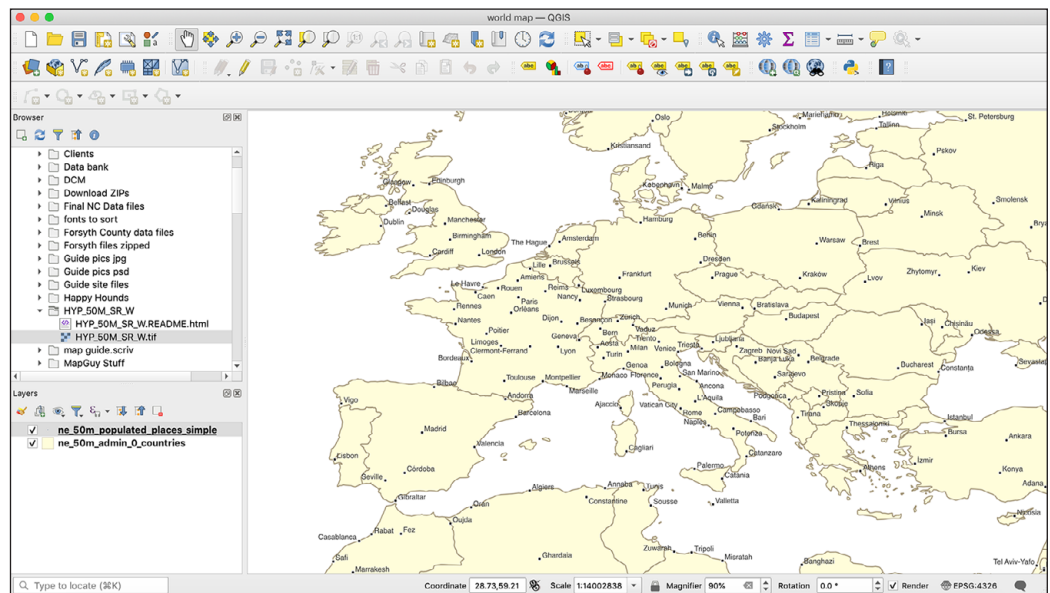

2. Go to **Project > New Print Layout**. A box will appear; enter a name and click **OK**. The Print Layout window will appear.
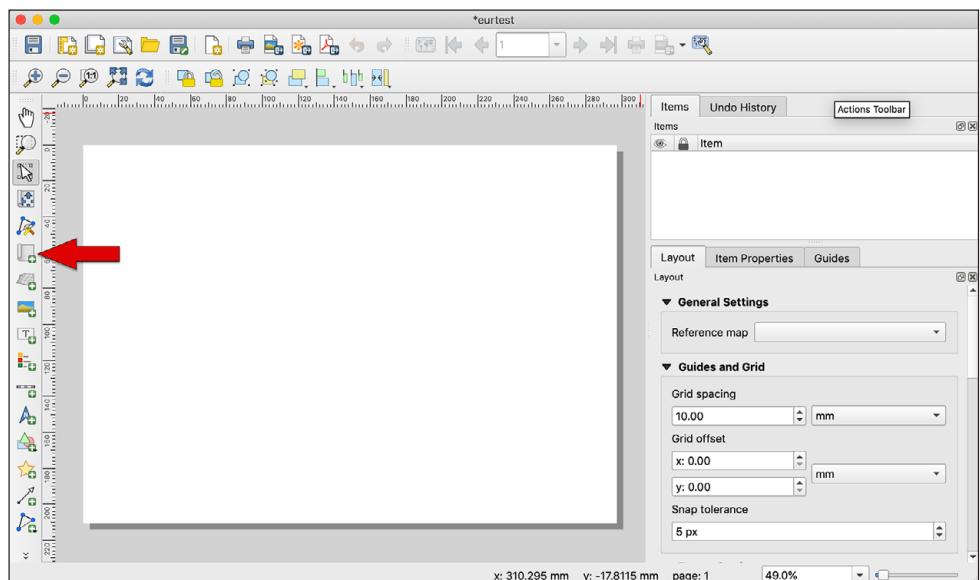
3. Click on the **Add Map** button (the red arrow in the image above) and draw a box on the canvas area. By default, QGIS draws the area that's within the visible area of the regular map canvas. That's why only Europe is shown here. You can also zoom in or out or move the map around when it's on the Print Layout canvas, but it's easier just to set the regular map canvas view to what you want before going to the export stage.
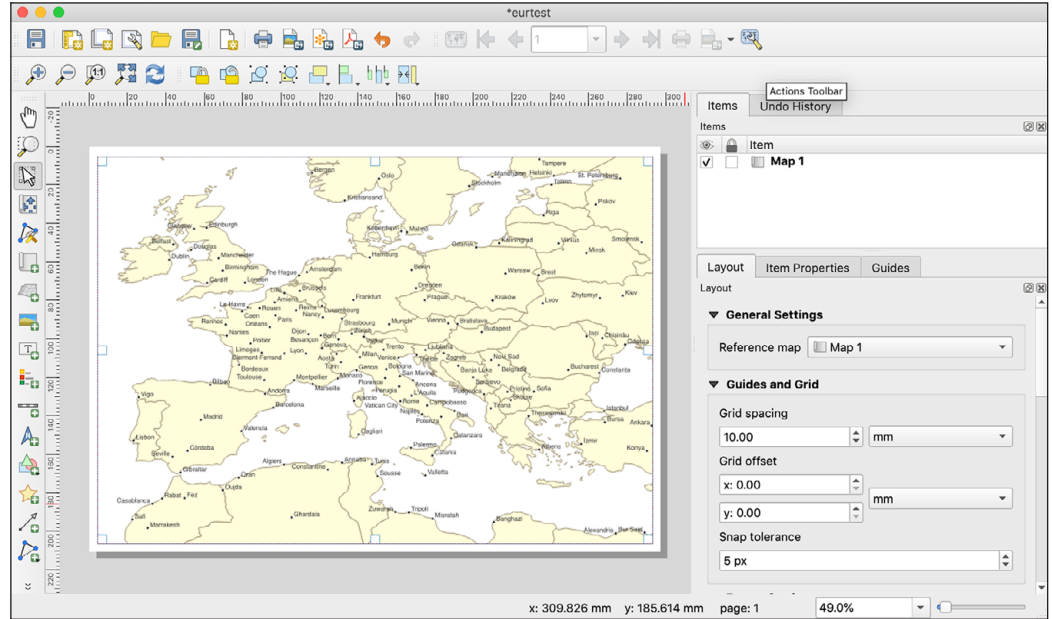

4. Go to **Layout > Export as SVG**. The **SVG Export Options** box will appear. Check boxes 1, 2 and 4 (the Export RDF one doesn't matter). For the **Text export** setting, QGIS gives you a choice for exporting labels: export them as outlines (so you can't edit them in Illustrator), or export them as text objects. Assuming that you might want to edit any labels in Illustrator, choose **Always Export Text as Text Objects**.

5. Click **Save**. It will take a few moments to process the file, and QGIS will show a notice when it's done. Save your file and quit QGIS. Now you're ready to move to Illustrator.
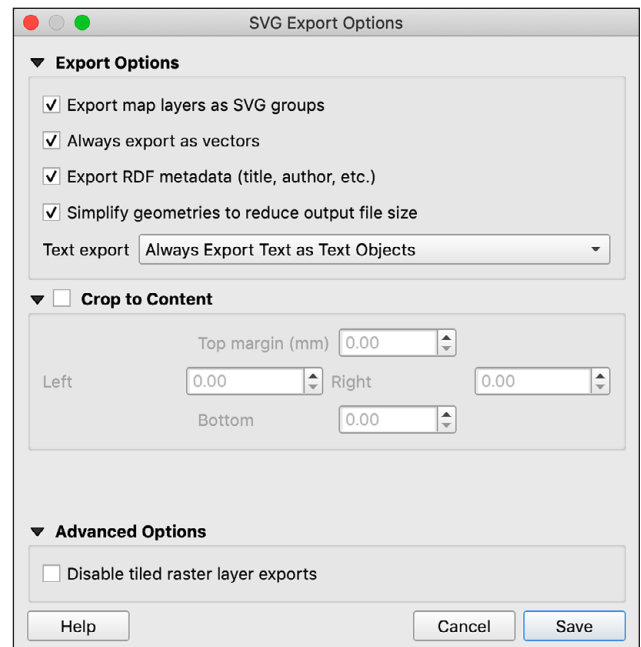
Working in Illustrator

1. Open the SVG file using Illustrator. Before you do anything else, save it in Illustrator format.
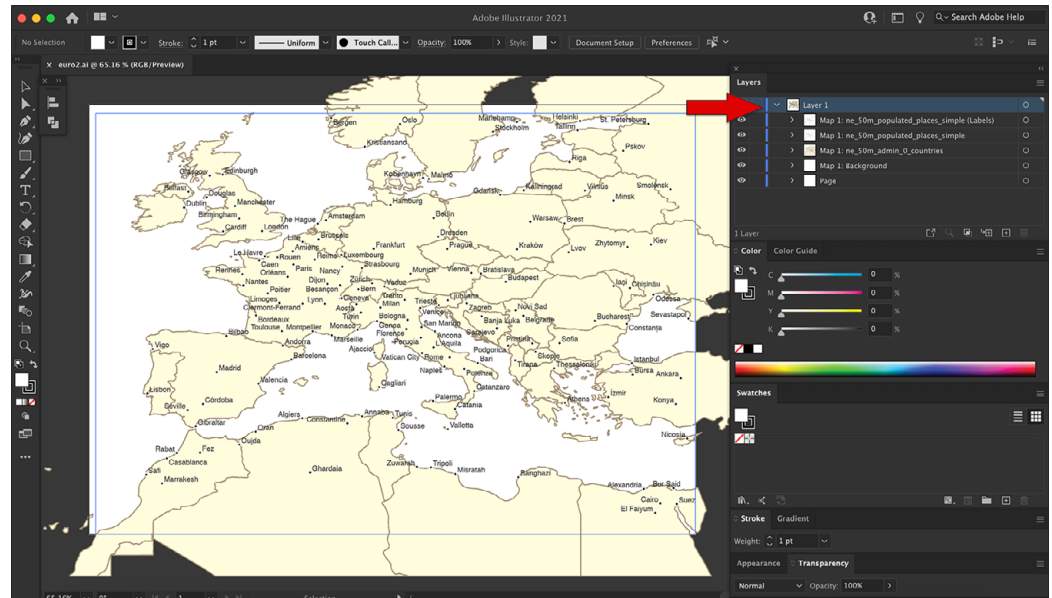

2. Open the Layers palette and open Layer 1 by clicking on the little triangle. Widen the palette enough to see the layer names. There are two layers at the bottom: Background and Page. These are both empty, but leave them for now.

3. You'll see some bounding boxes around the map. These just get in the way, so we'll delete them. **Important:** Use the Direct Selection tool for this (just click in a blank area); if you use the regular Selection tool, you'll delete parts of the map. You'll also notice that the two empty layers are now gone.
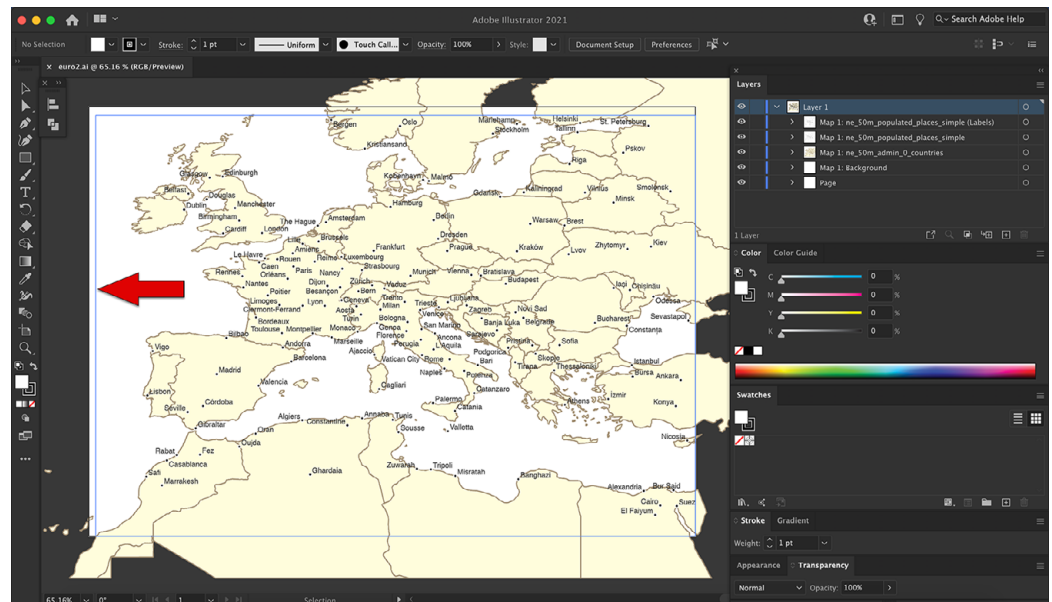

4. I'll rename the layers now to Labels, Cities, and Borders. This lets me reduce the width of the Layers palette.

5. Now we can do whatever we want to the map. The main thing I'll do is add oceans. First, I'll add a layer and name it Ocean, then move it to the bottom of the layer stack.
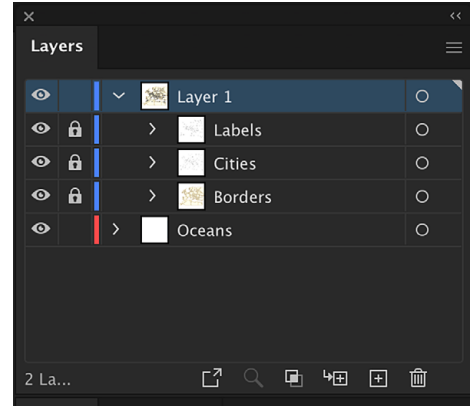
6. Click once on the Oceans layer and use the rectangle tool to draw a box around the map, then give the box a blue fill with no stroke:
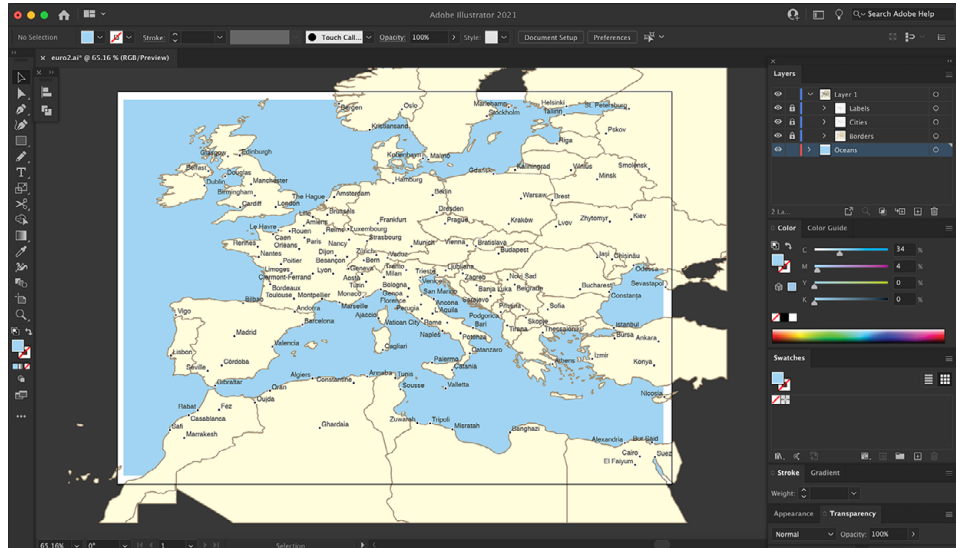
7. There's one more thing to do: add a layer mask to clip off the edges of the map. Click on the **Layer 1** layer to select it, then draw a box around the map where you want to crop it (I'll use the area I just colored). Give this box a fill and stroke of **None**. **Select All**, then go to **Object > Clipping Mask > Make**, and you should see this:

8. I could do some more with this map, but I'll call this one done for now. We'll do some more advanced styling in later tutorials. For now, you should understand the basics of creating a map in QGIS, adding data, exporting the map, and working with it in Illustrator.