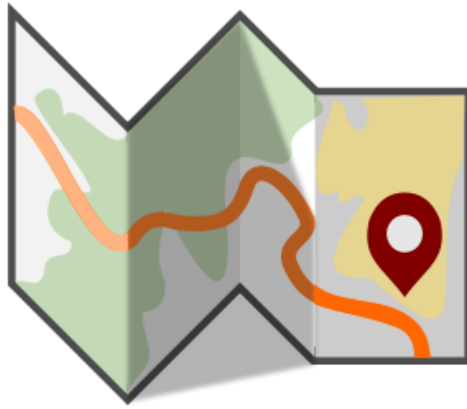


Georeferencing Scanned Maps and Aerial Imagery QGIS Tutorials and Tips



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Georeferencing Scanned Maps and Aerial Imagery

The basic process of georeferencing in QGIS involves reading the coordinates from your scanned map and inputting it manually. Many times though you may not have the coordinates printed on your map, or you are trying to georeference an image. In that case, you can use another georeferenced data source as your input. In this tutorial, you will learn how to use existing open data sources in your georeferencing process.

Overview of the Task

We will georeference an 1891 map of Boston, MA using OSM/Stamen from the OpenLayers plugin in QGIS.

Other Skills You will Learn

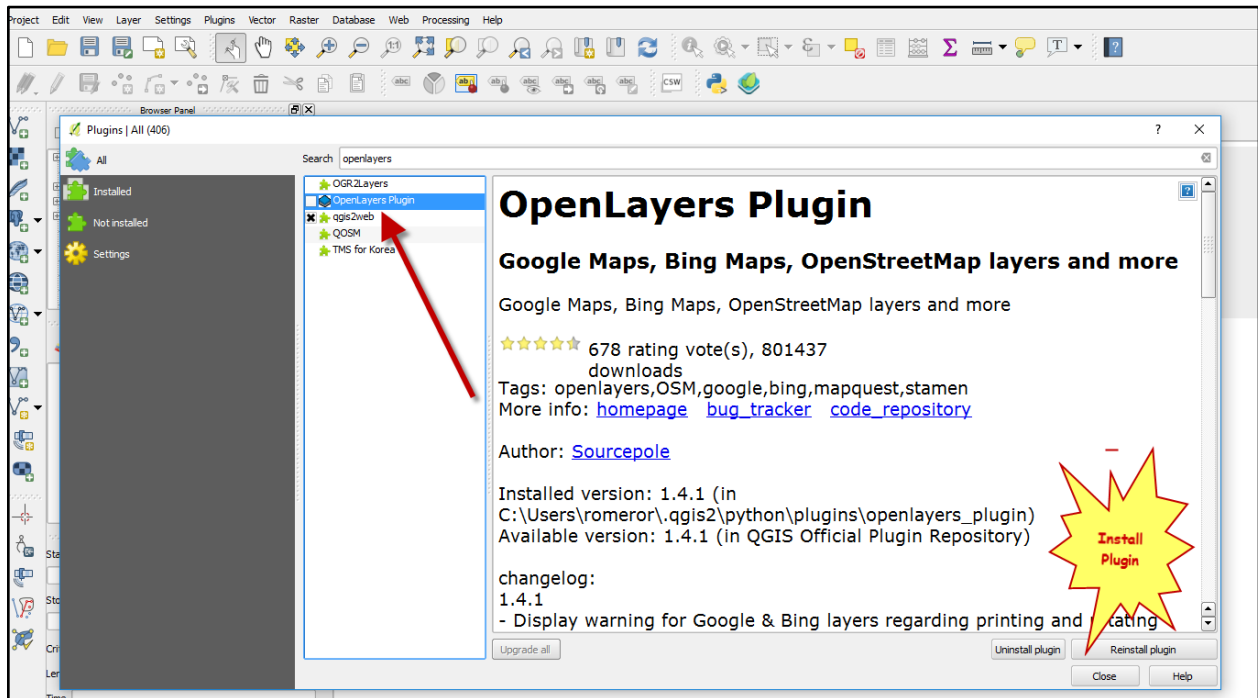
- Using the OpenLayers plugin in QGIS.
- Using an existing georeferenced layer to input GCP points in the Georeferencer tool.
- Setting a custom no-data value for a layer.

Get the Data

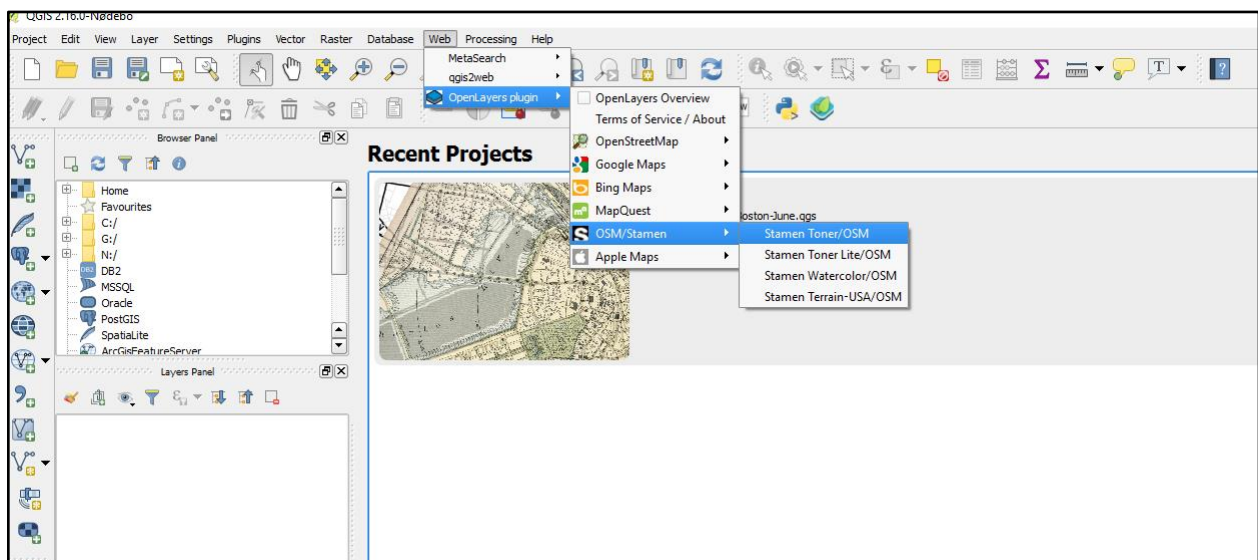
Download the 1891 map of Boston, MA. Available for download from the GIS Mini Course folder on Box. Contact Ramona Romero (ramona.romero@vanderbilt.edu) or Todd Hughes (todd.hughes@Vanderbilt.Edu) for access to the Box folder. The map may also be downloaded directly from the David Rumsey Map Collection: <http://www.davidrumsey.com/luna/servlet/s/7x9893>

Procedure

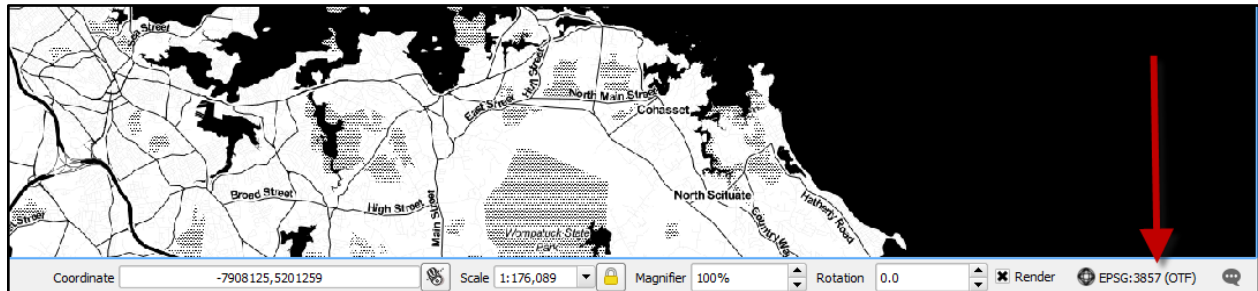
Step 1: For this tutorial, we will be using the OSM/Stamen layer as our reference layer. Install the OpenLayers plugin from Plugins ▸ Manage and install plugins ▸ Search ▸ Install Plugin



Step 2: Once installed, go to Web ▸ OpenLayers plugin ▸ Add OSM/Stamen layer ▸ Stamen Toner/OSM. This will add a layer of pre-rendered tiles created from OSM/Stamen data.

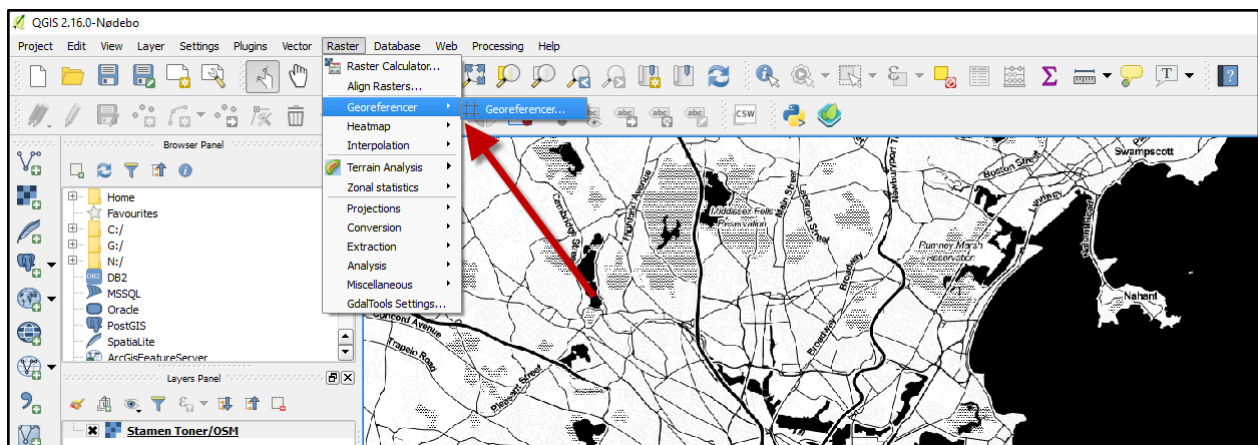


Step 3: Now you have the Stamen Toner/OSM layer loaded in QGIS. Note the Coordinate Reference System (CRS) for this layer. It is set as EPSG 3857 Pseudo Mercator (see bottom right of your screen). This is important to note, since the coordinates we infer from this layer will be in this CRS.

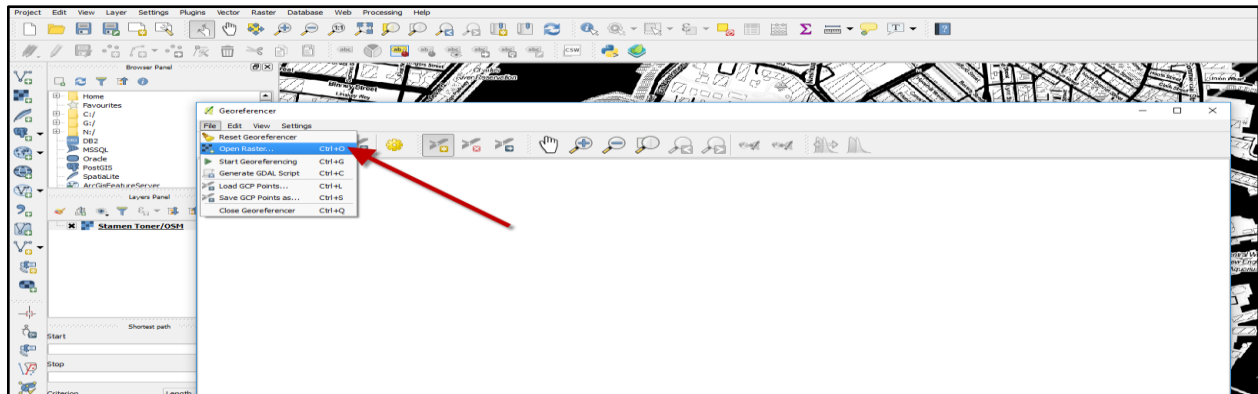


Step 4: Now the task is to locate the general vicinity of the area that we are trying to georeference. You can just use Pan and Zoom tools to locate that area on the Stamen Toner/OSM layer.

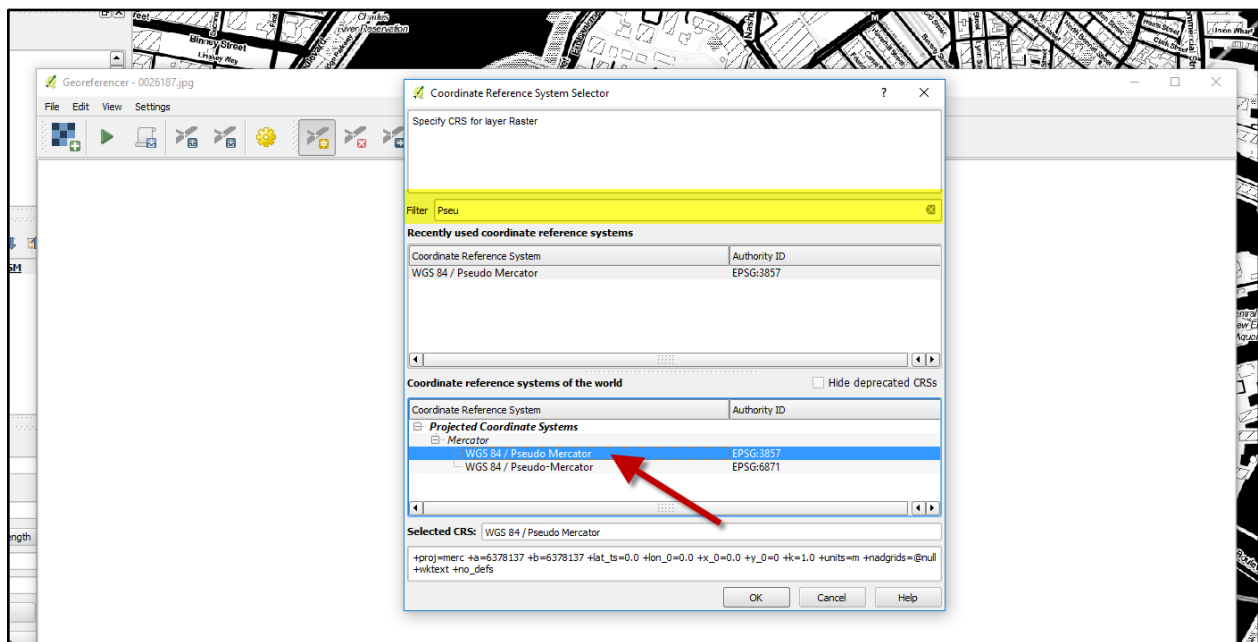
Step 5: Now it is time to start georeferencing. Launch the **Georeferencer** from Raster ► Georeferencer ► Georeferencer. If you do not see that menu item, you will need to enable the Georeferencer GDAL plugin from Plugins ► Manage and install Plugins ► Installed.



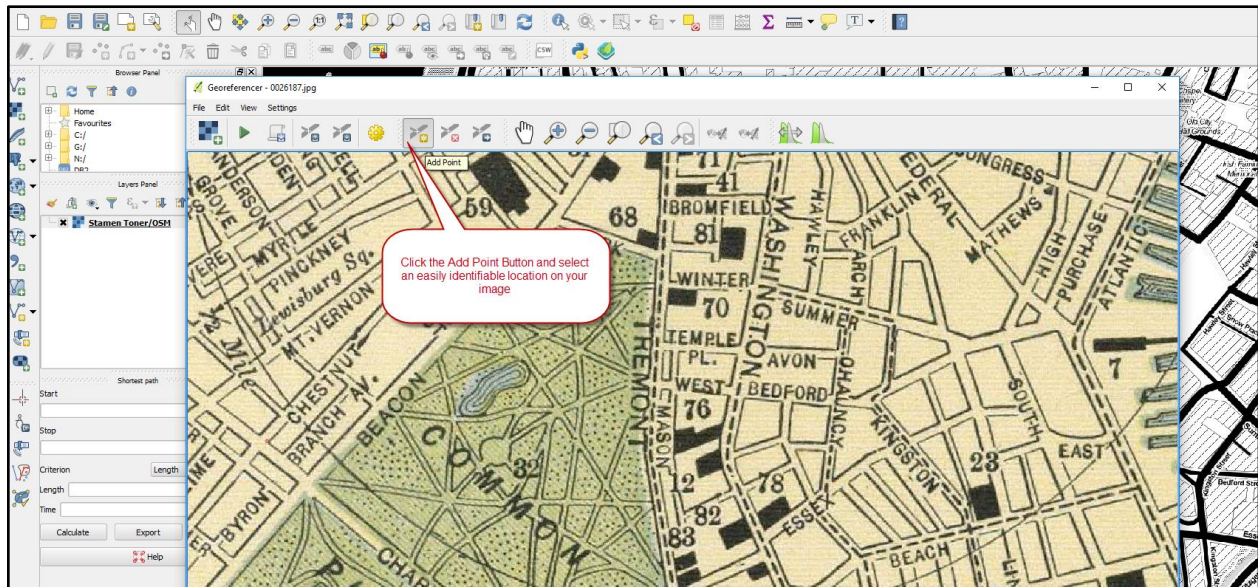
Step 6: . In the Georeferencer window, go to File › Open raster. Navigate to the downloaded JPG file and click Open.



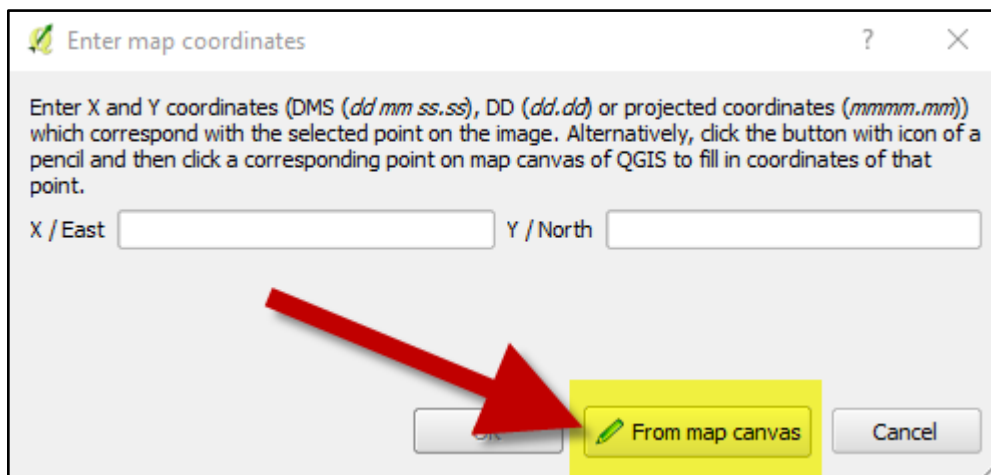
Step 7: In the Coordinate Reference System Selector, choose EPSG:3857 Pseudo Mercator. Use the filter to navigate to the correct CRS. Try searching **Pseu** in the filter search box to locate EPSG:3857 Pseudo Mercator. Click OK.



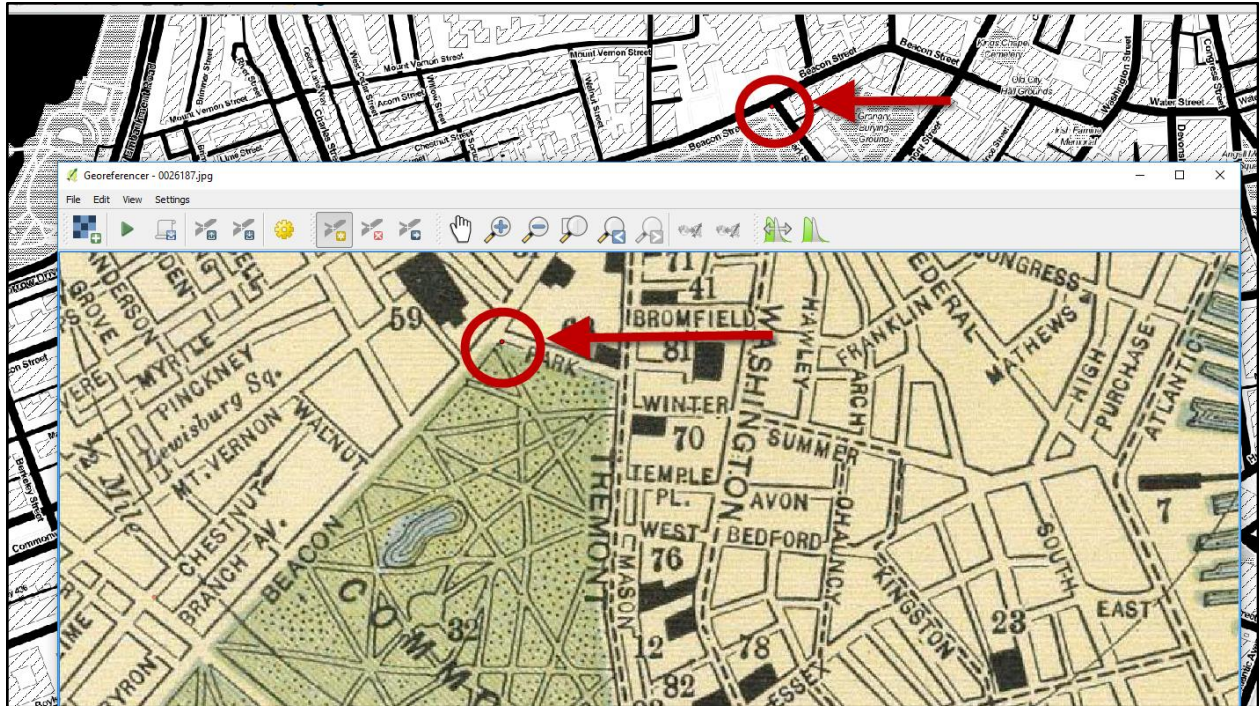
Step 8: Now click on the Add Point button on the toolbar and select an easily identifiable location on the image. Corners, intersections, poles etc. make good control points.



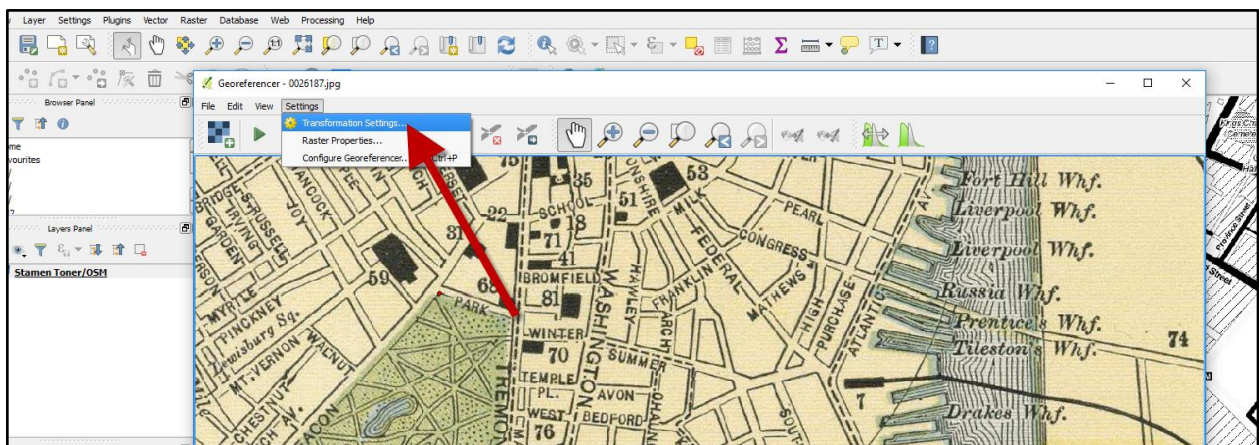
Step 9: Once you click on the image at a control point location, you will see a pop-up asking you to enter map coordinates. Click the button From map canvas.



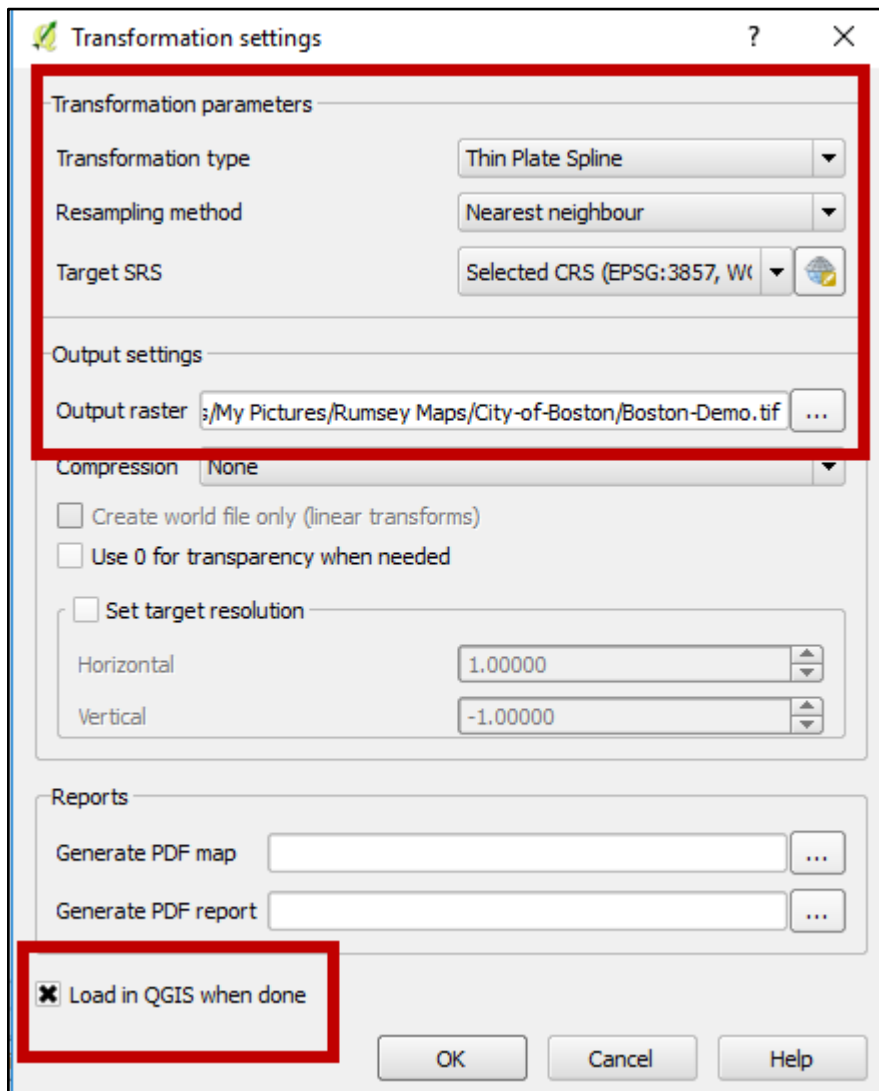
Step 10: Find the same location in your reference layer, i.e. the Stamen Toner/OSM layer and click there. The coordinates are auto-populated from your click on the map canvas. Click Ok. Similarly, choose at least 4 points on the image and add their coordinates from the reference layer.



Step 11: Now go to Settings ▸ Transformation settings.



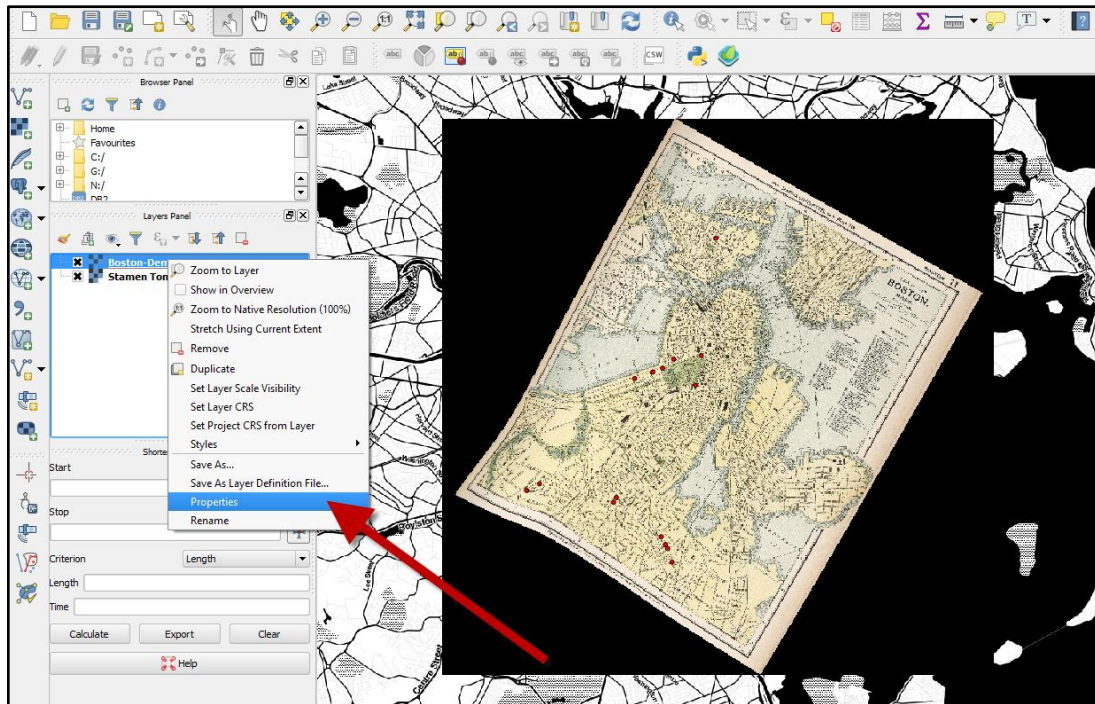
Step 12: The Transformation setting will open in a separate window on top of the Georeferencer window. Choose the Transformation settings as shown below. Make sure the **Load in QGIS when done** button is checked. Click OK which will close the Transformation settings window. Back in the Georeferencer window, go to File › Start georeferencing. This will start the process of warping the image using the GCPs and creating the target raster.



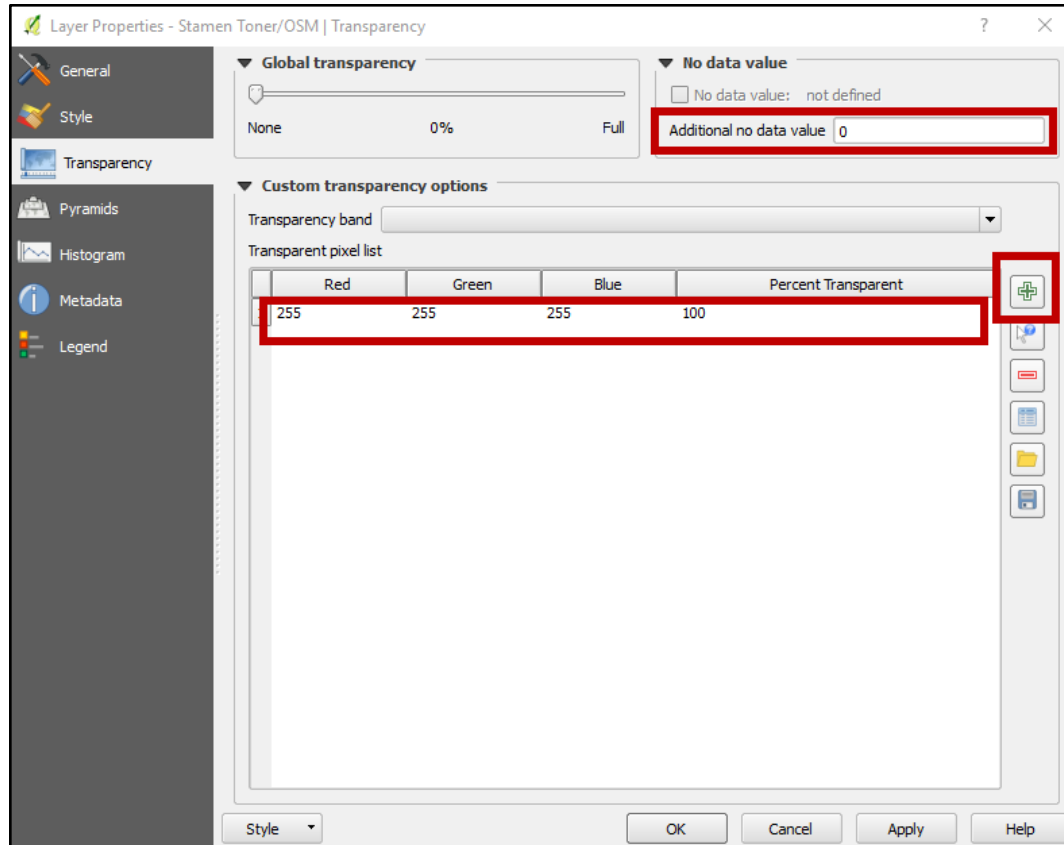
Step 13: Once the process finishes, you will see the georeferenced layer loaded in QGIS. If all went well, you will see it nicely overlay the Stamen Toner/OSM layer.



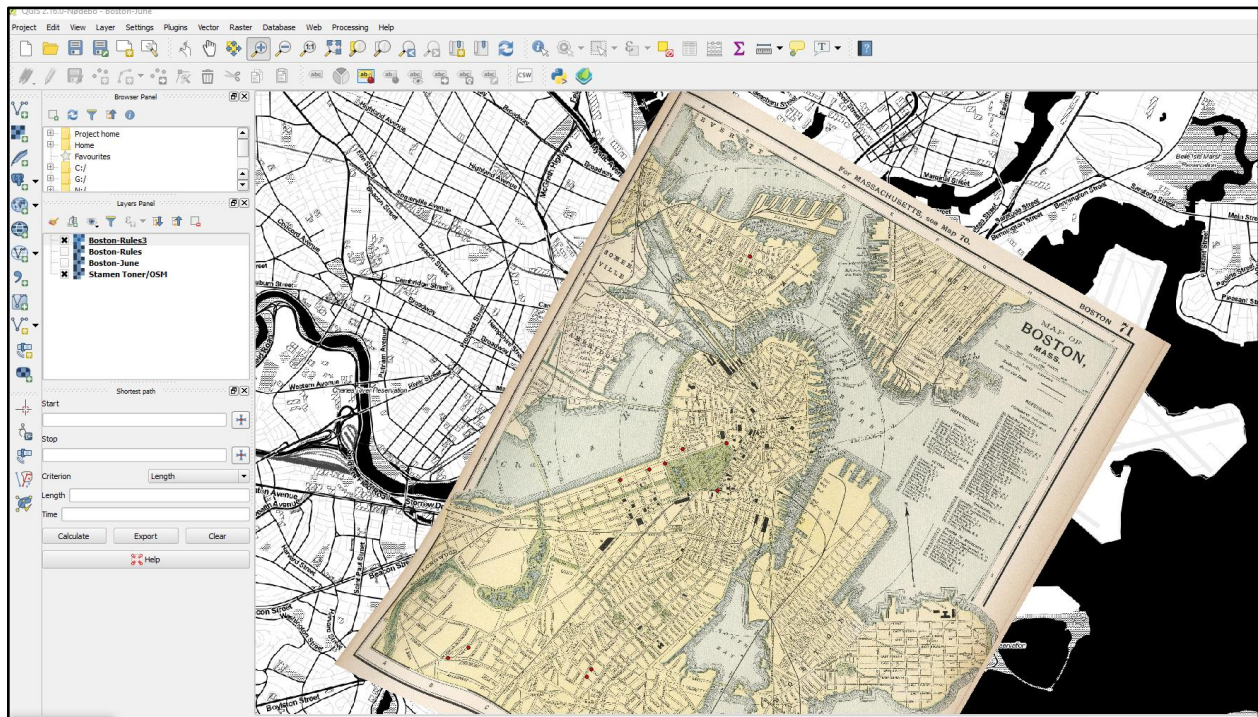
Step 14: To make our output look nicer, let's remove the black and white no-data values. Right click on the image layer and choose Properties.



Step 15: Click on the **Transparency** tab. We want to indicate that any black or white pixels in the image are no-data values and should be made transparent. Input 0 as the Nodata value. Also, in the Custom transparency options, click the green plus button and add 255 as the transparent pixels for each band and enter 100 as the Percent transparent. Click OK.



Step 16: Now you will see your georeferenced image nicely overlaid on the base layer.



Step 17: Remember to save your project before exiting QGIS!