Tutorial: GeoRerencing in QGIS

- What is Geoferencing?

 A Process of inserting spatial information (geo coordinated information) to a scanned image map that has no spatial information associated with it.

- Why do you need to do this?

So your scanned image map can be overlaid on top of any spatial layers to do further analysis in GIS.

- What do you need for this exercise?
  One scanned image (a map or any digital object. Usually jpeg format) and a georeferenced base map.

Before following the steps below, check "**Geoferencer**" tool is plugged in your QGIS desktop (How to check? : Raster>Georeferencer should display if plugged in).

Steps

1) Add a vector file (e.g. A VA County shape file below) related to the scanned image area that you need georeferening or a web base map (Google Physical or Open Street map— a bit slow to bring it up) in QGIS 2.14.
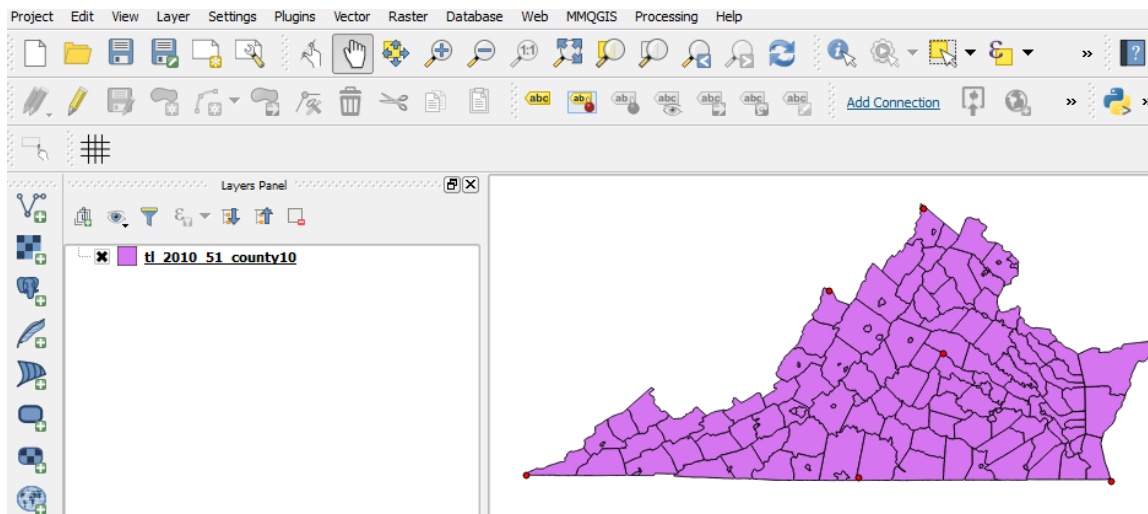

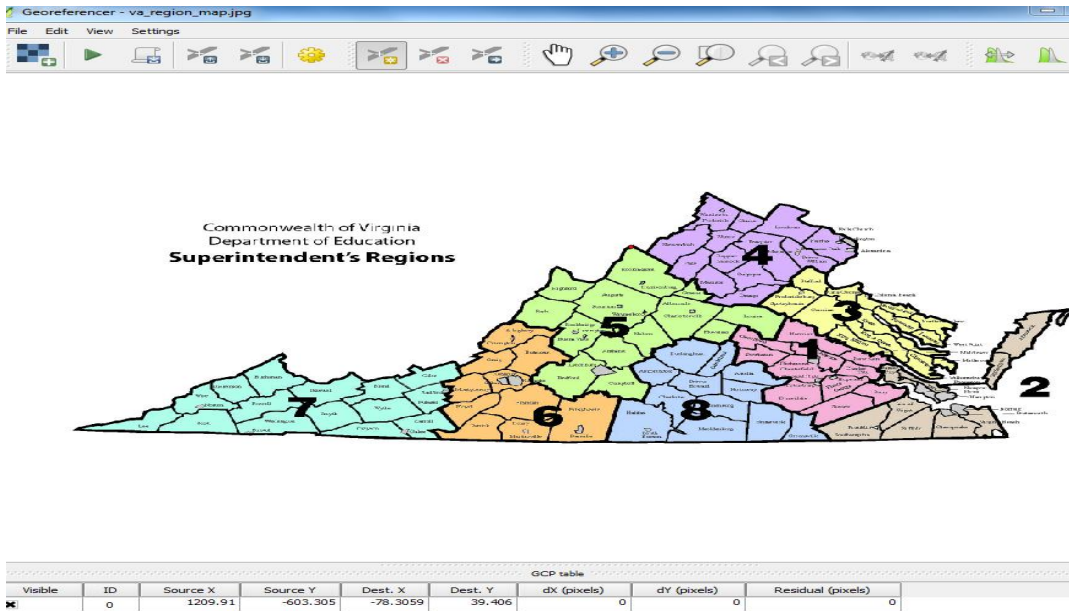2) Click **Raster>Georerencer** tool on the top menu, you will see the following screen
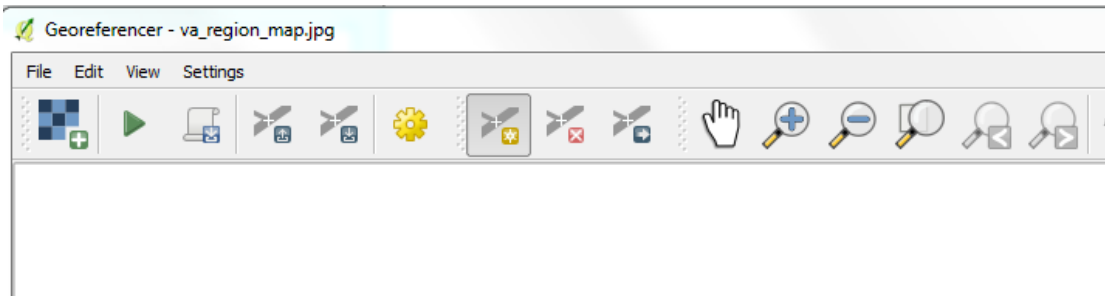
3) Go to **File> Open Raster**, and add an image file (e.g. va-region_map.jpeg) that you are georeferencing (NOTE: Specify CRS for your image such as WGS 84)
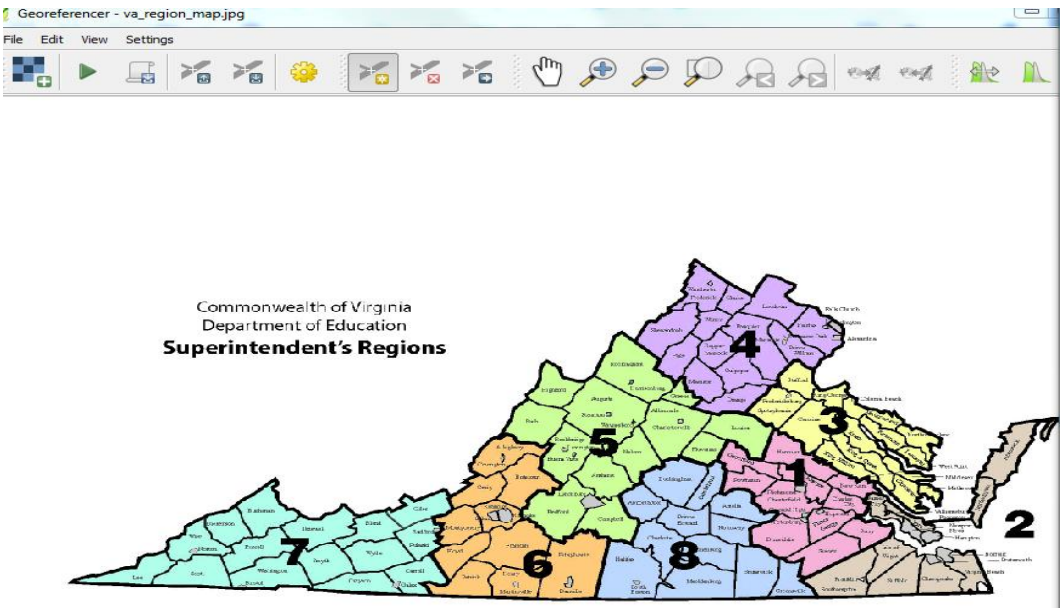

4) Click in Georeferencer tool bar and put a curser to a point that you want to use as a control point. Then, you will see the box below. Click the " **from Map Campus**" box, then move your curser to the point on your reference map (the left one in this case) to pick up XY Coordinates of the control point (if you collected the XYs of the control points from other sources rather than the reference layer that you are using, you don't have to use "from Map Campus." Just put down XY manually when you click your curser on a point) Then, click on OK.
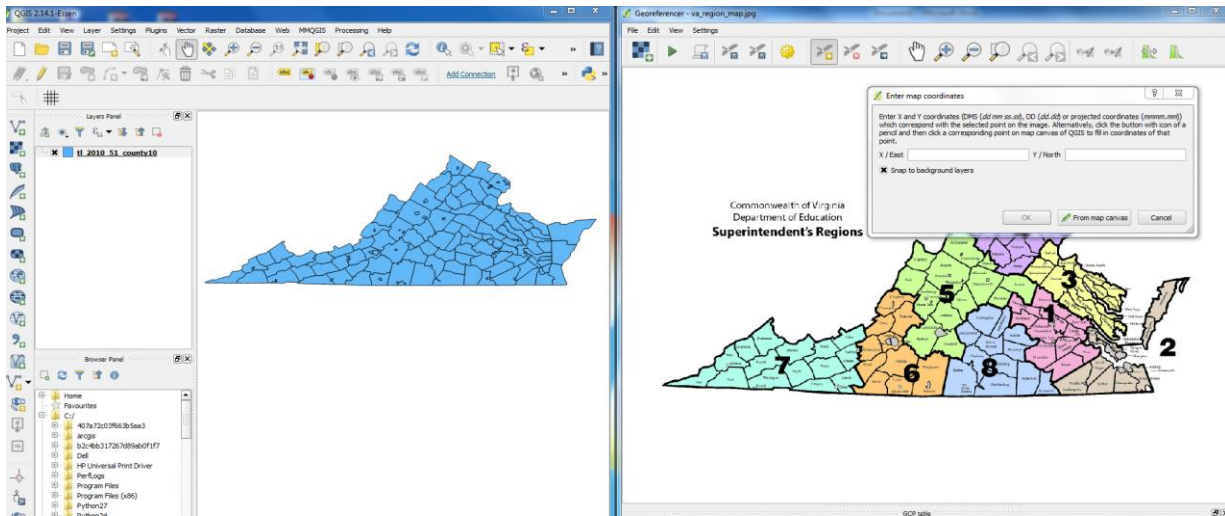
You will see the XY coordinates displayed in your scanned image map. Then pick up more different points (at least 5 or 6) throughout the map.


Visible	ID	Source X	Source Y	Dest. X	Dest. Y	dX (pixels)	dY (pixels)	Residual (pixels)
✗	0	1209.91	-603.305	-78.3059	39.406	0	0	0

5) After done, click on _____ OR **Setting>Transformation in Georeference**r menu bar. Then you will see a transformation setting box similar to the one below.
   o Choose, transformation type as Polynominal 1
   o Choose CRS as WGS84 (EPSG:3857) the same coordinate system you chose to set up the image file (NOTE: your reference map and your scanned image map coordinate system should be same)

o Choose a directory and folder that you want to save your output (georeferenced image file—should be in geotiff format).
o Click, OK.
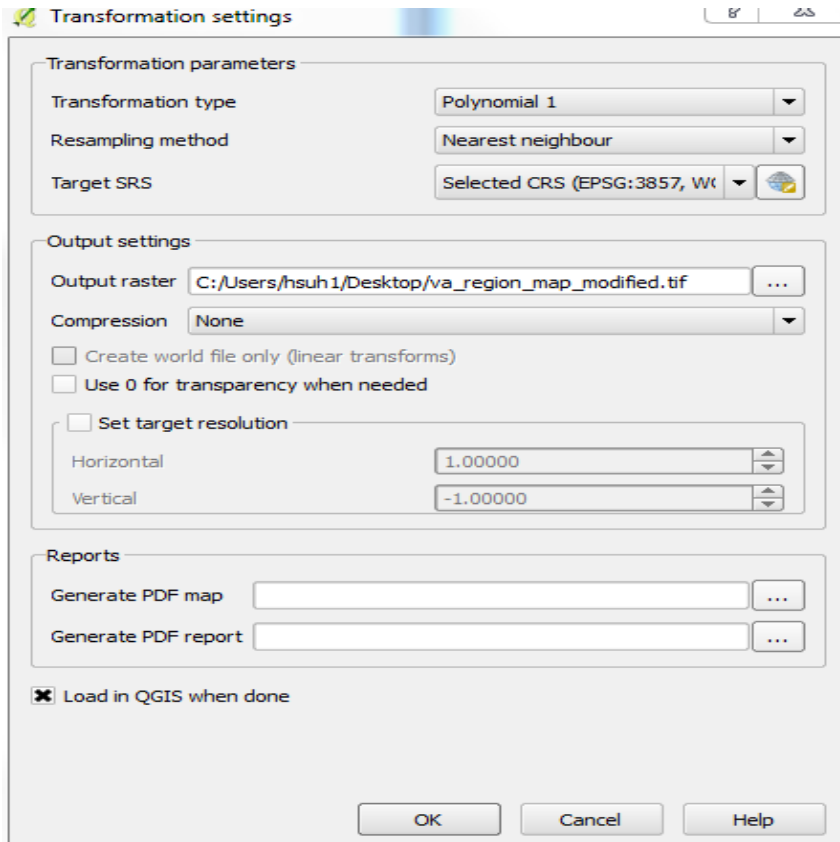
Check whether two maps are overlaying perfectly (Add two maps in QGIS below). If does, your job is successfully done. You can import your geotiff image file in any GIS environment to use

further GIS analysis.
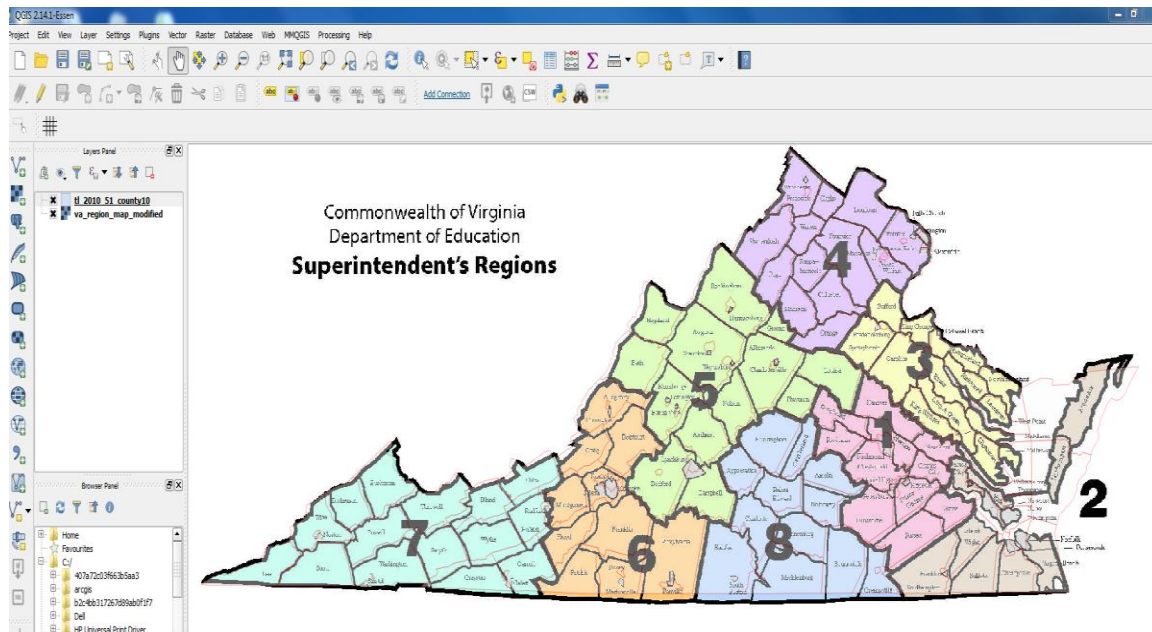
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