Carrying on: georeferencing

Summer School on Digital Humanities

Course material available at

https://bitbucket.org/augusto_ciuffoletti/digitalmaps4ssdh

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Carrying on: georeferencing

- The ability to turn an image into a map is called georeferencing
- In essence it consists in turning an image file (like a jpg), into a raster
- Intuitively, the operation consists in giving to a specialized tool a number of pairs of points
- The two points in a pair are taken one from the image (e.g., plant.jgp), another from a raster (e.g. OSM raster)
- At least three points are needed, but the more the better...
- Points must be distant, not aligned
- The georeferencing tool *morphs* the image, creates a raster of cells, and assigns coordinates to each of them
- As you might expect, qGis has an embedded georeferencer: let's give it a try

Georeferencing: preparation

- The first step consists in selecting a reference raster
- Start a new project and load the OSM raster, as we did previously
- Scale it to represent the area in your image map
- Annotate the SR (System Reference) shown in the bottom right corner of the screen: EPSG3857
  - this is the standard used to associate coordinates to OSM raster cells
- Select Raster -> Georeferencer...: a new window appears
- If EPSG3857 is not listed among the *recently used* you need to find it in the scroll list below
  - use the Filter box, there are too many
- This ensures that we use the same reference system in both maps
- We are ready to start associating points in the two maps

Associating two points

- Find a detail on the map that you can locate also on the raster
  - for instance, in an ancient map of France *Lutetia* corresponds to Paris
  - for better precision you can move the map using keyboard arrows, and zoom with mouse wheel, or use the tools on the toolbar, but you can't click!
- Click when the crosshair in on the detail
- The map disappears and a dialog appears asking the coordinates of the point
- Hit the From map button and you are brought to the raster
- Find the corresponding point on the raster
- qGis computes the geographical coordinates on the raster, and fills the dialog.
- Hit OK and repeat the above procedure for three or more points
- Remember: reference points must be distant and not aligned

Run the georeferencer

- Once you have finished associating points, you are ready to apply the geo-referencing algorithm
- Select Preferences -> Transformation settings to configure its operation
  - Transformation type is the kind of morphing: TPS is OK
  - Check the SR is EPSG:3857
  - Define a target file for the result
  - Tick "Load in qGis when done"
- Hit the green triangle in the toolbar
- A pop-up informs you when the process terminates

Inspecting the result

- Close the georeferencing dialog
- The image is pasted as another raster in the qGis window
- To evaluate the work of the georeferencer, we make the new layer semi-transparent
- Right click on the new layer (in the Layer frame) and select Properties
- Regulate Opacity around 50%
- The next slide shows the OSM raster of France with a georeferenced map of ancient french tribes
- The reference points are in Paris, Marseille and Bretagne
- There is an evident imprecision on the North coastline

Georenferencing result