

# Intro to QGIS – Make a Map

Avid Geo Conference – LocationTech Tour 2014

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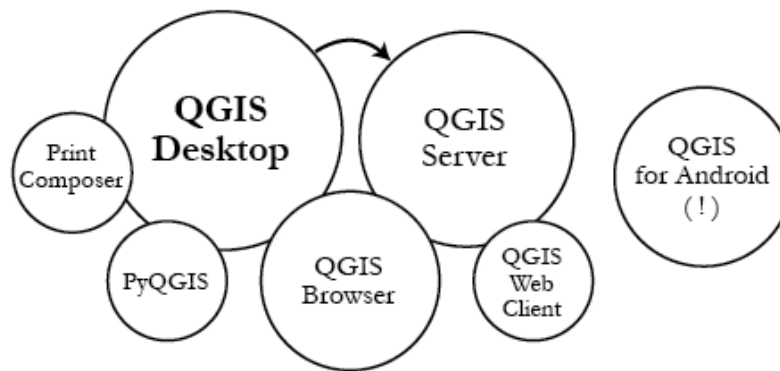
12:30-1:55pm – December 8, 2014

Presentation and Exercise: [www.graphicarto.com/qgis-101](http://www.graphicarto.com/qgis-101)

**What is QGIS?:** QGIS is a free and open source software (FOSS) alternative to commercial desktop GIS software. Formerly known as Quantum GIS, QGIS is an official project of the Open Source Geospatial Foundation, which is a community of developers dedicated to collaborative geographic technology development.

**History of QGIS:** Development began on QGIS in 2002 by Gary Sherman. In 2007 it became an official incubator project of OSGeo. 2013 saw the release of version 2.0, which included major updates to the user experience and interface, along with a streamlining of features. Current version is 2.6.1.

**Components of QGIS:** QGIS is a traditional desktop GIS, with local, network, and web oriented components. The QGIS ecosystem consists of the following various pieces of software and libraries:



## Highlights of the Software:

*Adding Data and Interoperability:* QGIS has a rich ability to open, import, export, and save many different file types. One common use of QGIS is for file conversion, there are a number of file formats it will open that other GIS software may or may not.

Vector Data Formats: [http://www.gdal.org/ogr\\_formats.html](http://www.gdal.org/ogr_formats.html)

Raster Data Formats: [http://www.gdal.org/formats\\_list.html](http://www.gdal.org/formats_list.html)

*Projections and Reprojecting:* Reprojecting a file, along with choosing a file type (such as JSON or Shapefile), is handled in the *Save as...* window. There is no explicit projection tool in the toolbox.

*Editing:* Editing is handled through the *Digitize* toolbar, along with the *Edit...* menu. We won't use this in the exercise today, but should be noted for future use.

*Geoprocessing:* QGIS has many rich built-in geoprocessing and analytical tools. It also allows for an easy connection to PostGIS for further robust geoanalytic tasks.

*Print Composer:* Map composition, including legends, scale bars, and north arrows, is handled in the Print Composer, a separate but integrated component of QGIS Desktop. Export to image format, SVG, and PDF is available if you want to print or continue work in graphics software.

*Plugins:* Plugins are one of the most important (and favorite) parts of QGIS. It is a collection of community created tools and add-ons that allow for numerous additional capabilities, such as time management and geocoding. These are located in the *Plugins* menu at the top of your interface.

**QGIS Documentation, Read Me, and Tutorials:** <http://www.qgis.org/en/docs/index.html#26>

## Exercise: Make a Map – Boston 311 Data: Rodent Incidents (Rat Map!)

This is a hands-on exercise, introducing the software and going over some basic map creation tasks, including adding data, projecting files, symbolization, map design, and basic geoprocessing. The final output will be a map of Boston neighborhoods, with each colored according to the number of Rodent Incidents as reported through the Boston 311 system as of September 2013. Download the data package here:

<http://www.graphicarto.com/qgis-101/data-package>

### I. Familiarize with the User Interface

Explore and click around the UI to familiarize yourself with the location of elements.

### II. Add Data

- Click on **'Add Vector Layer'** in the *Manage Layers* panel. Add the **Boston Neighborhood shapefile** from the Data Package. This will display the file and default our map to NAD83 Massachusetts Mainland projection.
- Click on **'Add Delimited Text Layer'** in the *Manage Layers* panel and add the **rodent incident data** to the map. Populate according to the proper latitude and longitude fields. A point events layer will appear on your map.

### III. Export and project the Rodent Data

- Right click on the *Rodent layer* and select **Save as...** A dialog will appear. Choose shapefile as the file type and *NAD83 Massachusetts Mainland (ftUS) EPSG:2249* as the projection. Save to your local drive, and make sure you add a copy to your map.

### IV. View Attributes

- Remove the point events layer created from CSV from your map, make sure you are working with the shapefile. Right-click and select **Open Attribute Table**. Note the various attributes of the data. In the next step we will symbolize using the **Source** field, telling us where the report came from.

### V. Symbolize the Points

- Right-click on the layer again and select **Properties**. In properties, choose the **Style** tab. Set the type to be *Categorized*, then set the column to *Source*. Click **Classify** to classify the data. Select your colors and symbols.

### VI. Basic Geoprocessing – Points in Polygon

- Geoprocessing and Analysis tools are located in the *Vector* and *Raster* menus at the top of the interface. Select **Vector -> Analysis Tools -> Points in Polygon**. Set *neighborhoods* to be our polygon layer, and *rodent* points to be our point layer. This will spatially join our two layers, giving a count for how many points fall in each polygon.

### VII. Symbolize your Polygons

- In layer properties on the new neighborhoods layer, symbolize according to the count. This is a total count we are working with, you could normalize by area if you wanted to normalize the map.

### VIII. Layout your Map in the Print Composer

- Once happy with your data and analysis, navigate to the *Print Composer* to layout your map. Go to **Project -> New Print Composer**. Name your new *Print Composer* 'Rat Map'. Here, **add your map, legend, scale bar, north arrow, etc.**

### IX. Export your Map to PDF, SVG, or an image.

- In the *Print Composer*, navigate to the **Composer** menu, then **Export to...** (selected format). You have created a 'Rat Map'!

### EXTRA: Explore and Add Plugins (specifically the OpenLayers plugin)

Plugins add many capabilities that can be useful. Plugins are found by navigating to the **Plugins** menu at the top of the interface. **Plugins -> Manage and Install Plugins** will load the dialog where you can search and install. I recommend starting with the Open Layers plugin, which will let you add Google Maps, Bing Maps, OpenStreetMaps, Stamen, and others as basemaps to your map layouts.