QGIS FAQs

Frank Donnelly, GIS & Data Librarian, Brown University

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1 Installation

1. **Which version of QGIS should I use?** QGIS comes in two flavors: the latest release which is updated quarterly, and a long term release (LTR) which is supported for at least one year. New users and those who value stability over new features should use the LTR release.

2. **After installing the software, which program do I launch?** The plain "QGIS Desktop" option. The other options (visible to MS Windows users under the Program Menu) are other open source GIS packages that are bundled with QGIS to provide additional functionality.

2 Basics

1. **What are vector and raster files?** Vector files model discrete geographic features as points, lines, or polygons (areas) whose geometries are stored as strings of coordinates. Vector features have associated attributes that are stored in a table. Common file formats include shapefiles and geopackages. Raster files model geographic features as a continuous surface divided into grid cells of equal size, where each cell has a value that denotes an attribute or measurement. There are many file formats, similar to those used for storing digital images. Both vector and raster files are drawn or warped to a specific coordinate reference system (CRS), that ties them to actual locations on the earth and allows them to be overlaid. QGIS has separate sets of tools for working with vectors and rasters.

2. **How do I add data to my project?** Two options. First, you can use the Data Source Manager and choose the type of file (vector, raster, etc.), drill down through your file system and select the files (you can make multiple selections using a combination of the CTRL or Shift keys). Second, you can use the Browser Panel, which displays your machine's file system. Drill down through the folders, and drag the files you want into the map view. Files you add to a project will be listed in the Layers Panel.

3. **How do I open an existing project?** Go to Project - Open or hit the folder button.

4. **How can I reset the zoom to see all of my layers?** The Zoom to Full button will reset your view to the full extent of all your layers.

5. **How do I change the drawing order of layers?** Select the layer in the Layers Panel, hold down the left mouse button, drag it above or below the other layers, and release.

6. **Why won't some of my layers draw together? Some don't appear, others look odd.** Some layers may be in different coordinate reference systems that cannot be overlaid. See section 6.

7. **How can I access properties (symbols, labels, attributes) for a layer?** Select a layer in the Layers Panel, right click, and choose the Properties option to access the symbols and labels tabs, or the Attribute Table option to view the table. Alternatively, you can double click on a layer to open its properties menu.

8. **I accidentally closed a toolbar or panel. How do I get it back?** Right click on a blank area of any toolbar to see a list of toolbars and panels that you can check on or off.

9. **I opened a project, and received a message that some of my files can't be found.** Each project file saves links to data files that are part of the project. If you created a project and subsequently moved either the project or data files, the links to the data become broken. QGIS allows you to restore the link to each data file by browsing through your file system and selecting the appropriate one. To prevent this from happening, store your projects and data files together in folders and subfolders, and move the top-level folder that contains them all.

10. **I shared my project file with someone. Why can't they see my data?** Data is not stored in a project file; project files store links to data files. If you want to share a project with someone, you must share both the project and the data. If you have them stored together in the same folder, you can ZIP the folder and share the ZIP file. If you just need to share a final map, take a screenshot or export a finished map from the print layout as an image or PDF.

3 Making Selections

1. **Why can't I identify or select features in a specific layer?** Select the layer in the Layers Panel to make it active. Then use either the identify ![identify] or select ![select] tools to select the features you are interested in.

2. **How can I select multiple features manually?** While using the select ![select] tool, hold down the CTRL key (Command key on a Mac) while clicking on features to select or deselect them.

3. **How do I select features in a layer that meet specific criteria?** Select the layer in the Layers Panel, then use the Select By Expression ![expression] button (access it via the drop down beside the Select by Value ![value] button) to create a query to select features based on their attributes. Or use the Select by Location tool under the Vector - Research Tools menu to select features based on their geographic relationship with other features.

4. **How do I create a new layer from a subset of features in an existing layer?** First, select the features by attribute or location (see above). Then, select that layer in the Layers Panel, right click, and choose Export - Save Selected Features As. In the dialog specify the file format, browse to the location ![browse] where you want to save the new file, assign it a name and save it.

4   Editing

1. **Can I add and delete columns? And modify attributes?** Open the attribute table for the layer. Open the field calculator ⊞ and check the box to create a new field, giving it a name and data type. Length is the total number of characters that the field can hold, while precision is the number of values to the right of the decimal place (inclusive of length). You can use the expression builder to do basic math (multiply or divide one column by another, or by a constant), convert values and data types, and generate area, length, and coordinates from the geometry. Calculating fields is done within an edit mode; you will need to save and exit ✏ this mode before the resulting data from the calculation renders properly. You can delete columns and modify individual values in the attribute table while in the editing mode.

2. **Can I add or delete individual features?** Select the layer in the panel and hit the edit ✏ button. Use the selection ▦ tool to select a feature and delete it. This can also be done within the attribute table. There are separate tools for adding features; this is simple to do for points but requires extra time and skill for lines and areas.

5   Joining Tables and Plotting Coordinates

1. **How do I join a data table to a vector layer?** Add the layer and table to the project; you add tables to a project using the Browser, or the Vector option ⊞ in the Data Source Manager ⬤. Open the properties menu of the *spatial layer*, and go to the Joins tab. Click the plus symbol to add a new join. In the menu, choose the *data table* that you want to join to the spatial file, the unique ID in the data table, and the matching unique ID in the spatial layer. Optionally, you can choose specific columns from the data table to include, or take them all. Delete the text in the Custom Field Name Prefix option to avoid long column names in the joined table. Click OK, and OK again. Open the attribute table for the *spatial layer*, scroll to the right, and you should see all the joined columns from the table.

2. **I joined a table to my layer, but all of the joined columns are missing.** First, verify that you joined the data using the correct ID columns, that these ID columns in fact have matching identifiers, and that they are of the same data type (text or numeric). If this is not the issue, it is likely that your data table is not well structured. Remove the join and go back and edit the table. Data tables must consist of rows that represent geographic features (no summaries, subtotals, footnotes, titles, extraneous text, merged cells, or formulas), have a unique ID column, have only one header row, and have column headings that *begin* with text (not numbers or punctuation) and contain *no spaces or punctuation* except for underscores.

3. **I joined a table to my layer, but some of the rows are missing.** Either there were rows that were in your spatial layer but not in your data table or vice versa, or there were non-matching ID codes for those records.

4. **I joined a table to my layer, but can't use any analytical tools on the joined columns.** After the join, save the spatial layer as a new file (right click on the layer in the Layers Panel, choose Export - Save Features As, and specify file type, location ▦, and file name). This new spatial

file will have the table data permanently fused to it, and you will be able to perform operations on the columns.

5. **How do I plot coordinates from a text file?** Your data must be saved in a CSV or TXT format. Go to the Data Source Manger ![icon], select delimited text ![icon], and specify: the delimiter (separator) used in the file (comma, tab, pipe, etc.), whether the file has a header row, and the columns that contain the X and Y coordinates (longitude is X and latitude is Y). When prompted, specify the coordinate system that the coordinates *are in* (basic long / lat is usually WGS 84, US federal government sources are NAD83). Once plotted, right click on the plotted coordinates in the Layers Panel and export / save them as a new spatial layer.

6. **I plotted coordinates from a text file, but they appear in the wrong places.** First, verify that you specified the X and Y coordinates correctly (longitude as X, latitude as Y). Second, verify that you specified the coordinate reference system of the points correctly. This must represent the system the coordinates *are in*, not the system you ultimately want them to be in. Once they're plotted in their original system, you can subsequently convert them to another system when exporting / saving them as a spatial layer.

7. **Why can't I perform spatial operations on plotted points?** Points plotted from a text file lack geometry; they are simply plotted on the fly from coordinates stored as attributes. After plotting, right click on the points in the Layers Panel and Export them to a new vector file that contains geometry.

6 Coordinate Reference Systems and Map Projections

1. **How can I identify what CRS a layer is in?** Right click on the layer, open its properties menu, and go to the Information tab. Alternatively, outside of QGIS you can navigate to the folder where the file is stored, and if it's a shapefile you can open the .prj file in a text editor to view it. You can also refer back to the source; the website where you downloaded the file and any associated documentation or metadata.

2. **How do I transform the CRS of a layer?** You can right click on the layer in the panel, choose Export - Save Features As, and when saving the new file you can modify the CRS from the current one to a new one. Or, you can go to Vector - Data Management Tools and select Reproject Layer. In both cases, you are creating a brand new file that has a different CRS. General advice: instead of re-projecting files in different systems in an existing project, open a blank project to transform them, and add the newly transformed files to your existing project.

3. **I just transformed the layer to a new CRS, so why does it look exactly the same as before?** The map window in QGIS also has a CRS; it assumes the CRS of the first file that is added to the window. You can see what this is by looking at the EPSG code in the lower right-hand corner of the interface and hovering over it to see the system name. When you add a new file that does not match the window, QGIS will redraw the layer on the fly to match it (but the file remains in its original system). To see what the new file really looks like, select the newly projected layer in the panel, right click, choose Set CRS - Set Project CRS From layer. The window will be set to the new system and the layer will redraw.

4. **What is an EPSG code?** EPSG is an open source CRS library on which QGIS and most open source GIS software rely. The codes are shorthand for referencing different systems. For example, EPSG 4326 is WGS 84 and 4269 is NAD83. QGIS has augmented the EPSG library to include many additional systems found in ArcGIS. For most applications it's best to use a projected coordinate system that's appropriate for the area you are studying.

7 Mapping

1. **Why can't I select a column that I want to classify as graduated symbols?** In the Symbology tab in the layer's properties menu, you select Graduated and the column you want to map in the Value drop down. If a column does not appear it probably is saved as text and not as a numeric type. If it was from a joined table, go back and modify the source. Note that if any text appears in a column that's supposed to be numeric (a footnote for example) that column will be saved as text. You will need to clean the data to remove text. If the column is part of a spatial file, you can add a new column and populate it with data from the existing one while using one of the data conversion formulas; see section 4.

2. **What are the different classification schemes?** Each class can have the same range of values (equal interval), the same number of data points (equal count), or can be divided based on the presence of large gaps in the range of values (natural breaks). Pretty breaks uses a consistent range irrespective of the data values. Classes can be defined or adjusted manually (click on the values to edit the ranges).

3. **How do I access the map layout, to create a finished map with a legend, scalebar, etc?** Click the new print layout button to create a new map, or the print layout button to open existing maps.

4. **How do I change the page size and orientation in the print layout?** Right click on the canvas and select Page Properties. The default canvas is set to A4, which is the international standard for letter-sized paper. The "Letter" option is the 8 1/2 by 11 standard used in North America and parts of Latin America.

5. **Why doesn't my map appear in the map canvas?** You begin with a blank canvas and need to add your map. Select the add map button, click and hold in the upper left-hand corner of the canvas, and then drag to draw a box and release. Whatever was last shown in your map view will be displayed. Clicking on the map item (or any item in the print layout) makes its properties menu available on the right.

6. **How can I change the zoom to get my map to fit well within the map canvas?** The simplest approach is to zoom to the optimal extent for your map in the map window, *prior* to entering the print composer. Once you add your map to the composer, it will reflect the view displayed in the map window. You can change the area of focus by using the move item content button and dragging the content of the map. Changing the zoom is trickier; you can use the mouse wheel to move in and out one click. Or, select the map in the composer, click on its item properties on the right, and scroll down to the scale option. You can modify this number manually to zoom in (smaller number) or out (larger number). It takes some practice.