LAB 9: Introduction to QGIS Interface

QGIS Interface:

- Creating new Project
- Opening Vector data
- Changing the look of your data layer
- Navigating around your map
- Saving your first project
- Viewing data attributes
- Other Tips

Creating a new project

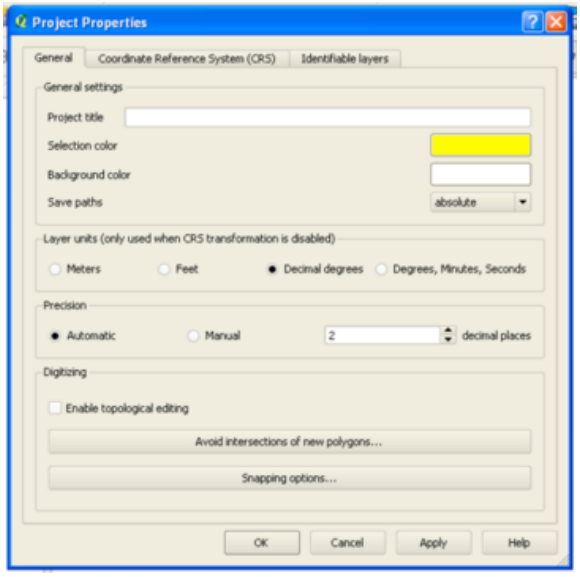
1. Launch QGIS by clicking **Start** > **All Programs** > **QGIS Desktop**
2. Create a new project. **File** > **New Project**.

A QGIS session is considered a Project. QGIS works on one project at a time. Settings are considered as being per-project or as a default for new projects. The kinds of information saved in a project file include:

- Layers added
- Layer proper ties, including symbolization
- Projection for the map view
- Last viewed extent

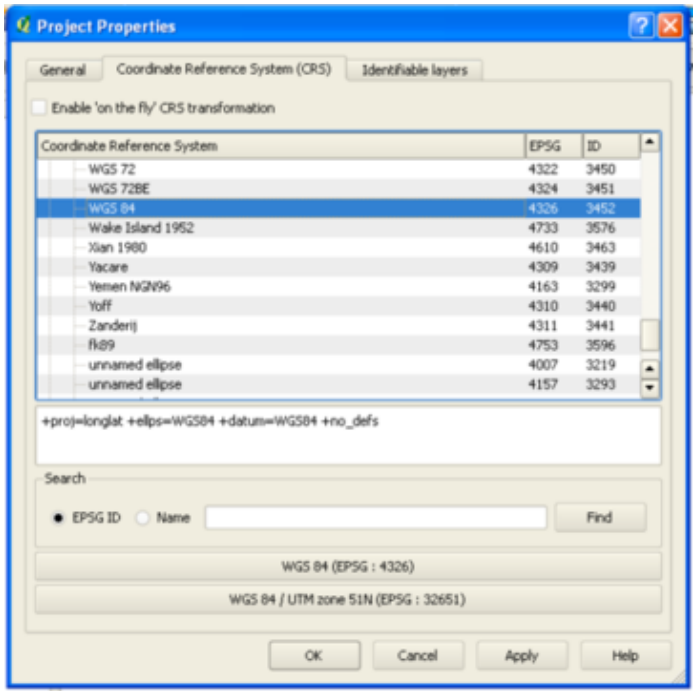
The project file is saved in XML format, so it is possible to edit the file outside QGIS if you know what you are doing.

3. Open the project properties. In the **Menu**, select **Settings** > **Project Properties**.



- In the **General** tab you can define the project title, selection and background color, layer units, precision, and the option to save relative paths to layers. In addition, the topological editing and layer wise snapping options are set here.
- The **Coordinate Reference System (CRS)** tab enables you to choose the CRS for this project, and to enable on-the-fly re-projection of vector layers when displaying layers from a different CRS. However, on-the-fly re-projection is only available for vectors data layers.
- With the third **Identifiable Layers** tab you set (or disable) which layers will respond to the identify tool.

4. Select the **Coordinate Reference System (CRS)** tab. Click the small *plus/minus* sign on the left side of the **Geographic Coordinate System**. This shows another list of CRS. Choose **WGS 84**. Click **Apply** then, **OK**.

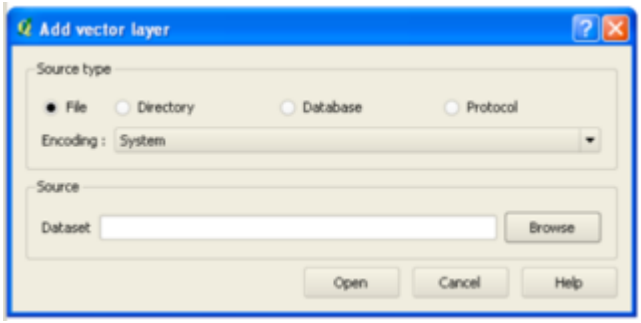


Tip

Most GIS application open any geospatial data (vector or raster) without asking for the coordinate referencing systems. QGIS follows a similar behavior. However, it is good practice to select the correct CRS whenever you start a new project. This habit can help you with problems in the future.

Opening Vector data

1. Add vector layers. In the **Menu**, select **Layer** > **Add Vector Layer**.



In the **Source Type**, choose **File**. Click **Browse** and double-click to your extracted *naturalearth_10m* directory.

Select multiple vector layers by holding the **Ctrl** button of your keyboard while selecting files. Select the following files:

```
10m_populated_places.shp
10m_admin_0_countries.shp
10m_coastline.shp
10m_lakes.shp
10m_river_lake_centerlines_scale_ranks.shp
10m_urban_areas.shp
10m_land.shp
10m_ocean.shp
```

Once all the files are selected, Click **OK** > **Open**. All vector layers will be loaded within your **Map View** area.

Vector data are represented as either point, line or polygon. The type of vector depends on what information you wish to convey.

- points - represented by a single X,Y coordinate. A point normally represents a geographic feature that is too small to be displayed as a line or area; for example, oil wells and fire hydrants.
- lines - A set of ordered coordinates that represent the shape of geographic features too narrow to be displayed as an area at the given scale or linear features with no area (county boundary lines). For example, railways, roads, rivers.
- polygons - A feature used to represent areas. A polygon is defined by the lines that make up its boundary and a point inside its boundary for identification. Polygons have attributes that describe the geographic feature they represent. For example, forest stands, lakes.

2. Arrange the display order of layers by selecting a layer in the **Map Legend** and then drag to either above or below the other layers.

Arrange the data according to this list from top to bottom:

```
10m_populated_places
10m_coastline
10m_lakes
10m_river_lake_centerlines_scale_ranks
10m_urban_areas
10m_admin_0_countries
10m_land
10m_ocean
```

Tip

Mapping standards suggest that point's layers should be on top followed by lines and finally polygons.

Changing the look of your data layer

1. Changing vector layer properties like color and symbolization. Select the:

   ```
   10m_ocean layer
   ```

   and right-click on the layer and select **Properties** from the pop-up menu.

The **Layer Properties** dialog for a vector layer provides information about the layer, symbology settings and labeling options. This dialog box allows you to customize the overall look of your vector data layers.

Select the Symbology tab. This provides you several ways to control how vector features are displayed.

For the ocean layer, we will change the fill color to a light blue color and remove the outline color.

In the Legend Type, select Single Symbol.

In the **Fill Options**, click on the **Fill Color**. Another window showing the **Color Palette** will then appear. Set the Red, Green, Blue (RGB) values to *170,255,255*.

Set **Outline Options** to **None**. Click **Apply**.

Select the **General** tab. This provides ways to change the display name, set scale dependent rendering options, create a spatial index of the vector file and view or change the projection of the specific vector layer.

Change the **Display Name** to `Ocean`.

Click **Create Spatial Index**.

A spatial index will improve the speed of both zooming and panning. Spatial indexes used by QGIS have a .qix extension.

Click **Apply** > **OK**.

2. Repeat all the steps above to change layer properties of each vector.

Follow the table below:

Layer	Display Name	Legend Type	Icon	Outline Options (RGB)	Fill Option (RGB)
10m_populated_places	Populated Places	Single Symbol	small black circle	n/a	n/a
10m_river_lake_centerlines_scale_ranks	Major Rivers	Single Symbol	n/a	0:0:255	n/a
10m_lakes	Lakes	Single Symbol	n/a	None	0:170:255
10m_coastline	Coastline	Single Symbol	n/a	85:255:255	n/a
10m_admin_0_countries	Countries	Single Symbol	n/a	Black	None
10m_land	Land	Single Symbol	n/a	None	253:246:229
10m_urban_areas	Urban Areas	Single Symbol	n/a	None	255:170:0

3. Explore the other options of the vector properties. The **Layer Properties** provides several options to customize the look and feel of your layers. Try to explore the other options until you're satisfied with the look. Try the following:

- Line styles
- Fill Options
- Different markers for points
- Transparency

Navigating around your map

Basic tools for navigating around the **Map View** involve the use of the zoom and pan functions. Each tool is explained below:

- **Pan** - Interactively move the center of the map
- **Zoom In** - Zoom in

- **Zoom Out** - Zoom out
- **Zoom Full** - Zooms to the full view of of all the layers
- **Zoom to Layer** - Zoom to the active or selected vector
- **Zoom to Selection** - Zoom to the selected object within a vector layer
- **Zoom Last** and **Zoom Next** - Goes back and forth to the previous zoom
- **Refresh** - Redraw all data layers

Zooming and panning with the mouse wheel. You can also press the mouse wheel to pan inside of the main window and you can roll the mouse wheel to zoom in and out on the map. For zooming, place the mouse cursor inside the map area and roll it forward (away from you) to zoom in and backwards (towards you) to zoom out. The mouse cursor position will be the center of the zoomed area of interest.

Zooming and panning with the keyboard. Place the mouse cursor inside the map area and click on the right arrow key to pan east, left arrow key to pan west, up arrow key to pan north and down arrow key to pan south. The **PgUp** and **PgDown** keys on your keyboard will cause the map display to zoom in or out

Tip

While you can do most navigation using the mouse, using the arrow keys on the keyboard for map navigation is very useful in many cases especially during digitizing.

Saving your first project

In the **File** menu, select **Save Project**. In the **Filename** field, type:

```
myfirstqgisproject.qgs
```

Click **Save**. You have saved your first QGIS project.

3.6. Viewing Data Attributes

Attributes for a vector data are stored in a table. (In a shapefile vector format, this is contained in a separate file with `dbf` extension). A table is like a spreadsheet. Each column in the table is called a field. Each row in the table is a record. Each of the records in the attribute table in a GIS corresponds to one feature. The application links the attribute records with the feature geometry so that you can find records in the table by selecting features on the map, and find features on the map by selecting features in the table. Each field in the attribute table contains contains a specific type of data – text, numeric or date.

In QGIS you can easily view data attributes by either selecting the feature within the layer of interest or opening the full table.

1. Using the **Identify Features** Tool.

In the **Map View**, select the Countries layer. This activates the Countries layer.

In the **Menu**, select **View** > **Identify Features**. Or just click the **Identify Features** in the toolbar.

Select on any polygon in the map to show the feature attributes. Try to **Zoom In** to the Philippines and display the attributes.

In QGIS you can easily view data attributes by either selecting the feature within the layer of interest or opening the full table.

1. Using the **Identify Features** Tool.

In the **Map View**, select the Countries layer. This activates the Countries layer.

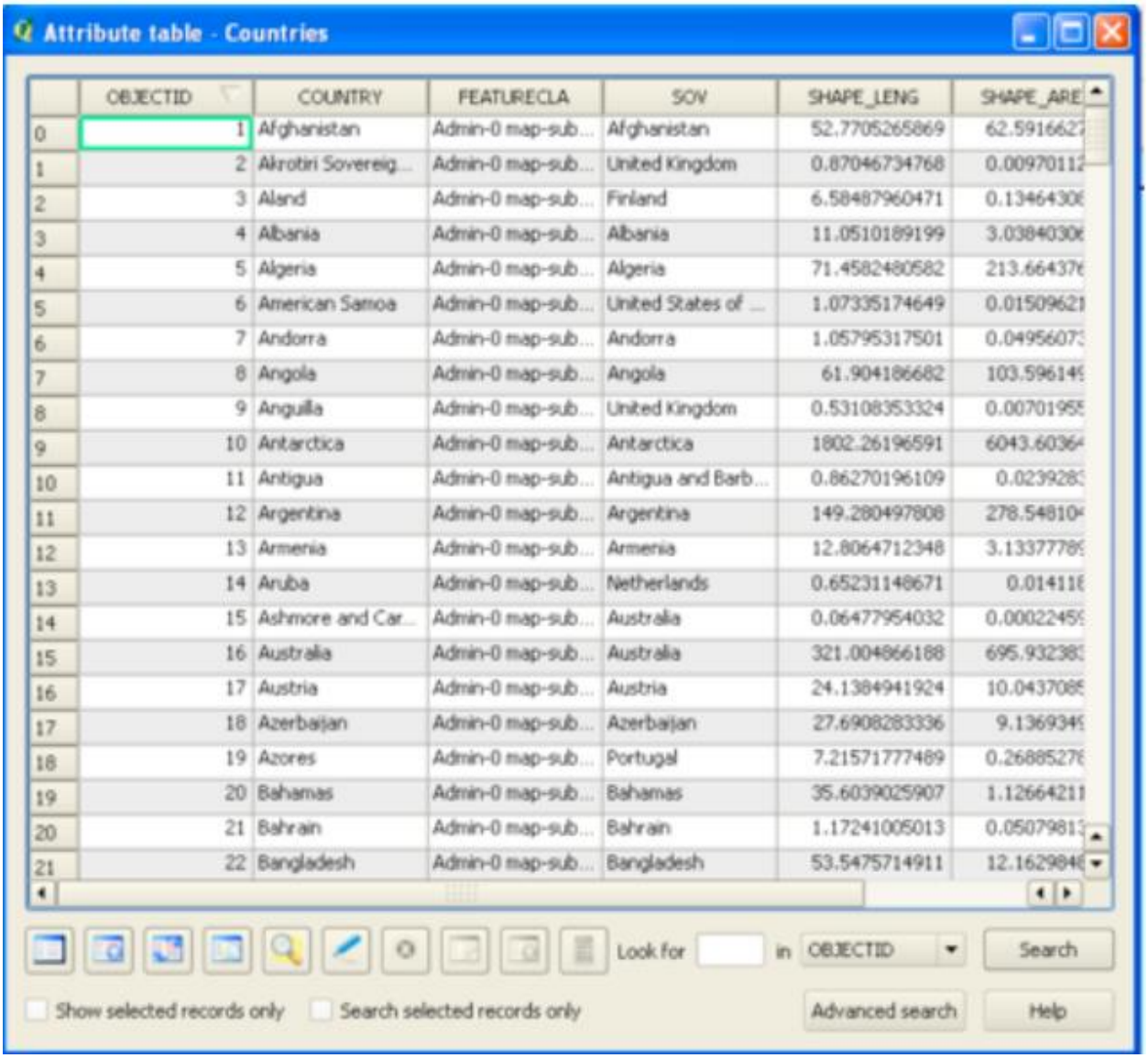
In the **Menu**, select **View** > **Identify Features**. Or just click the **Identify Features** in the toolbar.

Select on any polygon in the map to show the feature attributes. Try to **Zoom In** to the Philippines and display the attributes.

2. Viewing the attribute table.

To view the attribute table similar to a spreadsheet, select the Countries layer in the **Map Legend**. Right-click the layer and select **Open Attribute Table**

A new window will appear showing the full table of the Countries data layer. You can browse and edit the attribute table within this window.



A full explanation of the tools within the Attribute table window is presented below:

- **select All** - Remove selection from previous selected records
- **Move Selection to Top** - Move the selected records to the top of the table
- **Invert Selection** - Invert selection
- **Copy Selected Rows** - Copy selected rows to clipboard
- **Zoom Map to Selected Rows** - Zoom map to selected rows

- **Toggle Editing Mode** - Toggle editing mode to edit single values of attribute table and to enable functionalities described below.
- **Delete Selected Features** - Delete selected features
- **New Column** - This adds a new column in the attribute table. You will be asked to provide attribute details in a new window (name, field type, etc.).
- **Delete Column** - Delete column (only for PostGIS layers yet)
- **Open Field Calculator** - Open field calculator to update attribute data based on arithmetic, logical and other calculations

Try to explore the different tools to understand how each one works.

Tip

Shapefiles store attribute data in a separate file with a dbf extension. This is a widely used database format. You can edit database files outside QGIS using spreadsheet applications such as MS Office Excel and OpenOffice Calc, however, caution should be taken in order not to corrupt the files. Make sure you create a backup before editing the data outside QGIS.

Other tips

1. **Map Overview**

The map overview panel provides a full extent view of layers added to it. Within this panel is a rectangle showing the current map extent. This allows you to quickly determine which area of the map you are currently viewing.

To activate the **Map Overview**, in the **Menu**, select **View** > **Panels** > **Overview**. A new panel will be added below the **Map Legend** (no map is displayed at the moment).

We will add the Countries layer in the overview map. Select the *Countries* layer, then right-click and select **Show in Overview**.

The Countries layer should appear in the **Overview** panel

You can also add more layers or remove them. If you click and drag the red rectangle in the overview that shows your current extent, the main map view will update accordingly.

Warning

Do not add too many layers into the Overview Panel as this can slow down rendering of the overview map.

2. **Line and Area measurements**

To interactively measure length and area, use the:

- **Measure Line**
- **Measure Area**

The tool then allows you to click points on the map. Each segment-length as well as the total shows up in the measure-window. To stop measuring click your right mouse button. Areas can also be measured. The accumulated area-size will be visible in the measure window.

Warning

Length and area results inherit the default projection and ellipsoid units! If you are using the Decimal Degrees (which is the case in our current project) as the layer units, the length and area results will be in decimal degrees as well.

3. Using the Labeling Tool.

The Labeling provides smart labeling for vector point, line and polygon layers and only requires a few parameters.

Zoom in the map to the Philippines within the Cagayan River north of Luzon. Select the MajorRivers layer.

Open the labelling plug-in, in the **Menu**, select **Layer** > **Labeling**.

A new window will appear for the **Layer Labelling Settings**.

Select **OK**. The label for Cagayan River should be placed above the river line. As you pan around the map, you'll find the label placed nicely along the curve of the river.

Note

The smart labelling plugin is a preview of what will eventually replace the default labelling tool (which lacks smart placement etc). Using QGIS 1.4, you can only print using the default labelling, not the smart labelling plugin.

4. Import Image

To import the map view into an image, in the **Menu**, select **File** > **Save as image**.

Select your preferred filename and image type. Click **Save**. You now have you first map image which you can add in any document or report.

5. Save your project. To save your project, select **File** > **Save Project**.

Tip

It is good practice to save your project after every major editing activity. Make sure you save your project frequently. Or better practice the keyboard shortcut to save projects: **Ctrl + Shift + S**.