

Exercise

Creating a Map

In this exercise you will learn how to:

- **Creating a new print layout**
- **Adding & Editing map elements**
- **Printing the map composition**

Estimated time: 45 minutes

The purpose of this exercise is to understand map composition.


Data layer to use: “**LU_LC.shp**”

In order to communicate the output result of GIS analysis we need to create a map that can be printed or published. QGIS has a powerful tool called “**Print Composer**” that allows you to take your GIS layers and package them to create maps.

The print layout provides growing layout and printing capabilities. It allows you to add elements such as the QGIS map canvas, text labels, images, legends, scale bars, basic shapes, arrows, attribute tables and HTML frames. You can size, group, align, position and rotate each element and adjust their properties to create your layout. The layout can be printed or exported to image formats, PostScript, PDF or to SVG (export to SVG is not working properly with some recent Qt4 versions; you should try and check individually on your system). You can save the layout as a template and load it again in another session. Finally, generating several maps based on a template can be done through the **atlas generator**.

Step 1: Load the data layer into QGIS


Before starting with the map composition (print layout), first load the required data layers (raster or vector layers) in the QGIS map canvas and adapt their properties (classification, labelling [Step 5 of Ex 1], etc.) to suit your own convenience.

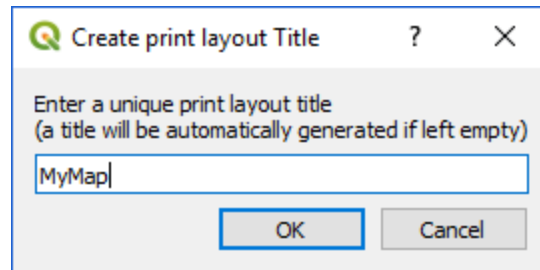
- Load “**LU_LC.shp**” layer and classify and label the loaded data layer, if required
- To classify the layer, right-click on the layer name in the layers panel and select **Properties...** option. Click on **Symbology** tab on left side and select  **Categorized** option from drop down menu. From the **Value** field select, **Description**. Click **Classify** button at the bottom of the window. Select a proper **Color ramp** and click **Apply** button at the bottom.

The displayed layer is classified.

Step 2: Open Map composition window

After everything is rendered and symbolized as per requirement, open the map composition window


- Click on  **New Print Layout** icon on Project Toolbar or Go to menu **Project > New Print Layout....** You will be prompted to enter a title for the composer
- In the prompted Create print layout Title window type a name for your map, say “**MyMap**” and click **OK** button




A map composition window is opened. Leaving the composer name empty will assign a default name such as “**Composer 1**”.

- Set the page size by right clicking on empty print layout window and select **Page Properties....** In the Item Properties panel, define the page parameters


Step 3: Add data layer to print layout window


- Click on  **Add new map** button on the side toolbar (Toolbox toolbar) or click on menu **Add Item > Add Map** and draw a box on the canvas holding down the left mouse button. Inside the drawn box the QGIS map view to the canvas. i.e., the drawn box will be rendered with the map from the main QGIS canvas

Note: While drawing a box on map canvas keep in mind to leave sufficient margin on all four sides of layout canvas for considering printer margins and adding grid labels.


- To move the copied data layer in the drawn box on the map / print layout window click on  **Move item** content icon on the side toolbar (Toolbox toolbar) or click on menu **Edit > Move Content** to pan the map data in the defined box



Step 4: Adjusting scale of the data layer

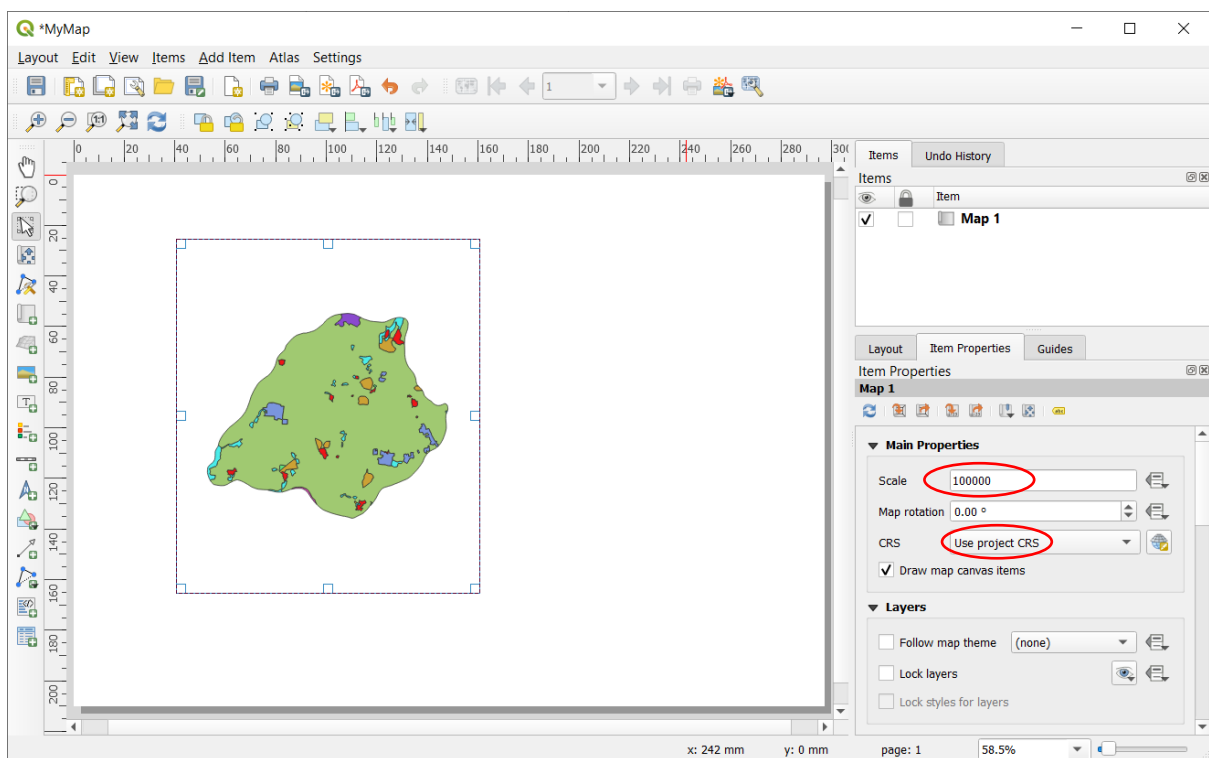
- To adjust the scale of the added data layer on map layout window, first select the added data layer by clicking on  **Select/Move item** icon on the side toolbar (Toolbox toolbar)
- Click on the **Item Properties** tab on the right side of the layout window and enter **20000000** for Scale value.

Also, the drawn box size can be changed by pulling the handles of the drawn box using  **Select/Move item** icon or using Extent values in **Item Properties** tab.


By default the project CRS is considered for adding grids to data layer on the print layout window. In case a different CRS is required, change it using **CRS** of Main properties of **Item Properties** tab.

Note: While adding map elements whenever you want to change the parameters of any of the map element, **first the element should be selected using  Select/Move item icon**. Then only you can access the properties of the relevant map element.

If, for any reason, the map view does not refresh correctly, you can force the map to refresh by clicking Refresh view  button on Navigation toolbar or clicking on menu **View >  Refresh** or by pressing **F5** key on keyboard





Step 5: Adding Map elements – Grid



- To add a grid and zebra border to the main map, in the **Item properties** tab, scroll down to the **Grids** section. Click the  **Add a new grid** button and **Grid 1** is added
- Select Draw “**Grid 1**” grid check box and click on **Modify grid ...** button to modify grid parameters
- Under the **Map Grid Properties**, you can change **Appearance** (Grid type, CRS, Interval units, offset, width of cross marks, line style, blend mode), **Frame** (Frame style, size, line thickness, divisions, etc.) and **Draw coordinates** (coordinate format, font type, font colour, coordinate precision, ...). To draw coordinates, first select the **Draw coordinates** check box

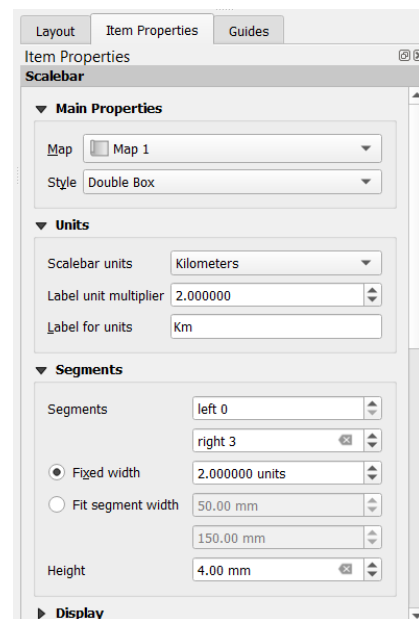
- 1) By default, the grid lines use the same units and projections as the currently selected map projection. However, it is more common and useful to display grid lines in degrees. Hence, change CRS to **EPSG 4326** (Lat / Long with WGS 84 datum)
- 2) Select the **Interval** values as **0.01** degrees in both *X* and *Y* direction. You can adjust the **Offset** to change where the grid lines appear. Select **Blend mode** to **Normal**
- 3) Scroll down to the **Grid frame** section and select a frame style that suits your taste. Also check the **Draw coordinates** box and select **Decimal with suffix** for **Format**
- 4) Adjust the **Distance to map frame** till the coordinates are legible. Change the **Coordinate precision** to 2 so the coordinates are displayed only up to the second decimal.

Step 6: Adding Map elements – North Arrow



- Now we will add a North Arrow to the map. The Print Composer comes with a nice collection of map-related images - including many types of North Arrows. Click  icon on the side toolbar or click menu **Add Item** >  **Add North Arrow**
- Holding your left mouse button, draw a rectangle on the top-right corner of the print layout canvas. On the right-hand panel, click on the **Item Properties** tab and expand the **Search directories** section and select the required North Arrow image. The QGIS folder where north arrows are available is C:\Program Files\QGIS 3.10\apps\qgis-ltr\svg\arrows.

Step 7: Adding Map elements – Scale Bar

- Now we will add a scale bar. Click on  icon on the side toolbar or click menu **Add Item** >  **Add Scalebar**
- Click on the layout where you want the scalebar to appear. A scalebar will be added to the canvas. In the **Item Properties** tab, make sure you have chosen the correct map element for which to display the scalebar. Choose the **Style** that fit your requirement. In the **Segments** section, adjust the number of segments required and their size. You can adjust other properties, namely, **Fonts** and **colors**, **Position** and **size**, **Rotation**, etc. See the adjacent figure for details





Step 8: Adding Map elements – Title or any text

- It is time to label our map. Click on  **Add label** icon on the side toolbar or click menu **Add Item >  Add Label**
- Click on the map and draw a box where the label should be. In the **Item Properties** tab, expand the Label section and enter the required title
- Similarly add another text / label as required


Step 9: Adding Map elements – Legend

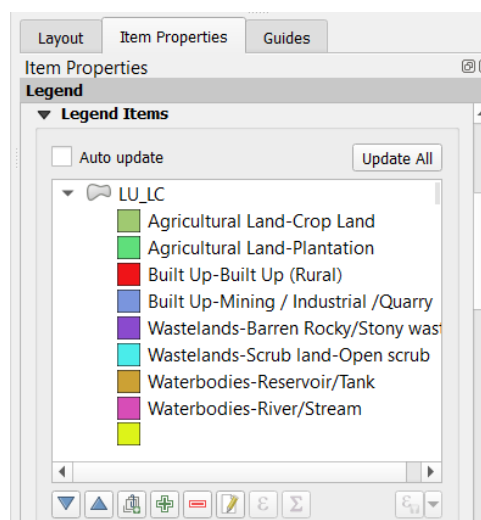
The map reader needs to be able to see what various things on the map actually mean. This is possible by looking at map legend

- Click on  **Add Legend** button on the side toolbar (Toolbox toolbar) or click on menu **Add Item >  Add Legend**
- Click on the page to place the legend, accept the suggested values in the New Item Properties dialog, and then move it to where you want it




Customizing Legend Items

Not everything on the legend is necessary, so some unwanted items can be removed




- Select the Legend by clicking on it
- In the **Item Properties** tab, you'll find the **Legend items** panel
- Click on **Auto update** check box to deselect
- Select the last entry (parrot green box) without any text matter
- Delete it from the legend by clicking the  button

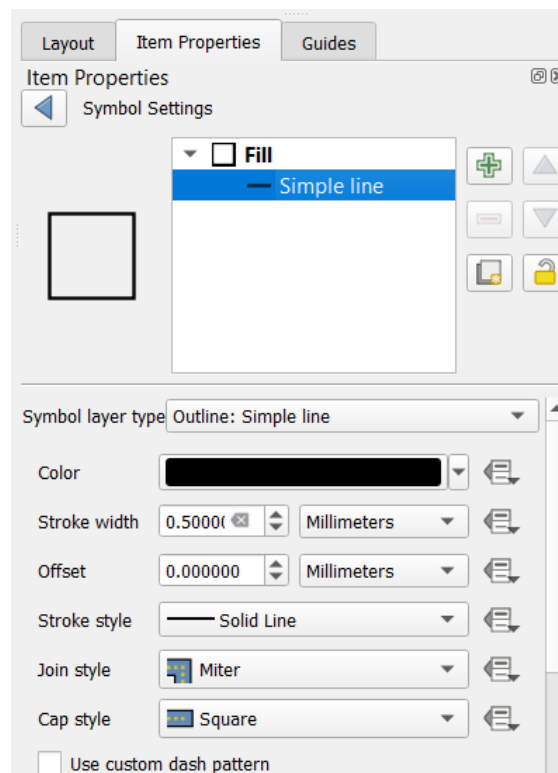


Similarly, by double clicking on a particular legend item, a pop-up window with legend item text is displayed. Now it can be edited as required.



Other elements like pictures, shapes, tables, etc. can be added using  Add Picture,  Add Shapes (graphic elements),  Add Attribute Tables, etc.

Step 10: Adding Map elements – Bounding box






- Click on  **Add shape** button and select **Add Rectangle** option on the side toolbar (Toolbox toolbar) or click on menu **Add Item >  Add Shape >  Add Rectangle**
- Click on the **Style** box and it displays symbol settings and select required **Symbol layer type** as shown in the following figure



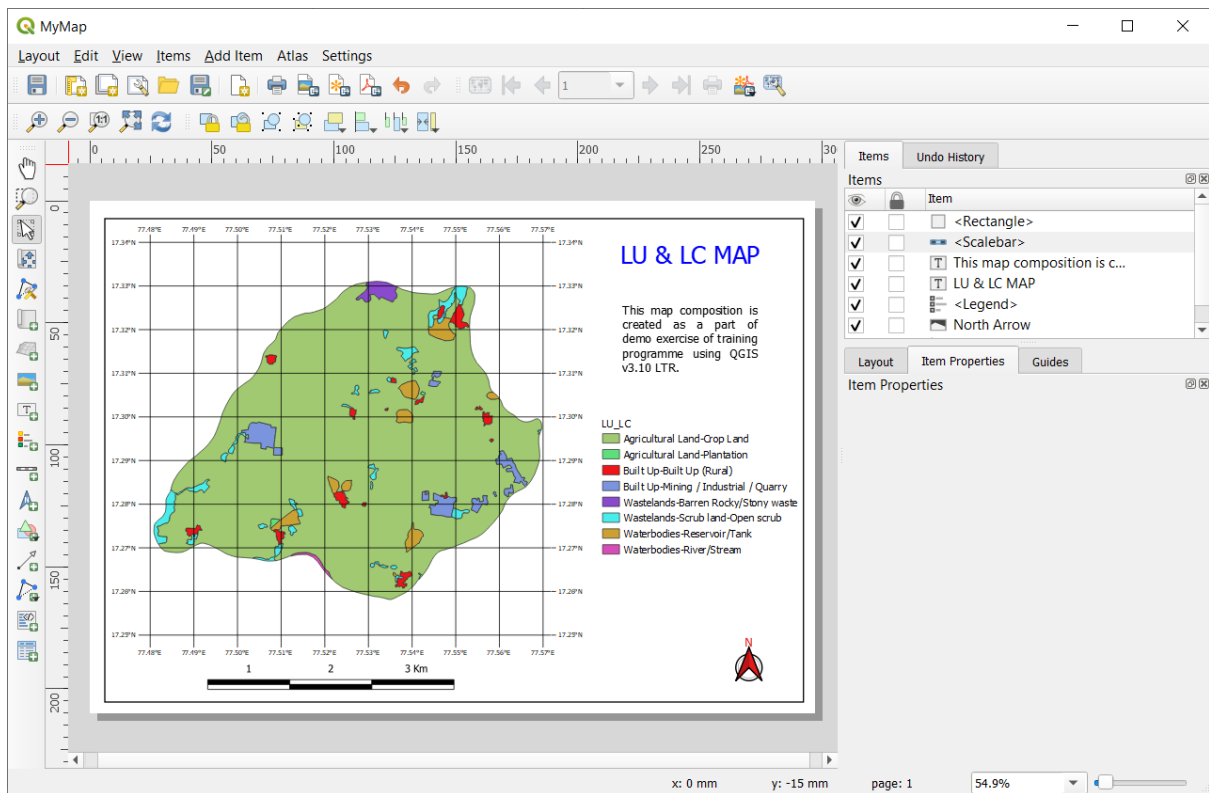
Step 11: Save your map composition


- Finally, save the map composition / print layout within the project file with the  **Save Project** button on the **Layout** Toolbar or select menu **Layout >  Save Project**



Step 12: Print or Export the map

- Once you are satisfied with the composed map, you can export it as **Image** () , **PDF** () or **SVG** () . For this tutorial, let's export it as an image. Click  **Export as Image** icon on the **Layout** toolbar or select menu **Layout >  Export as Image...**
- Save the image in the format of your liking (PNG, JPEG, TIFF, etc.)
- To print the map, select menu **Layout > Print**

Your final map composition may appear as follows.



If required to remove any element from the layout canvas, select the element by clicking on it and press the **Delete** or **Backspace** key on the keyboard or selecting menu **Edit** >  **Delete** option.

To open a saved map composition, in the main QGIS window click on  (Show Layout Manager icon) or click on menu **Project** >  **Layout Manager...** and select saved print layout (**MyMap**) from the pop-up **Layout Manager** window. The saved print layout window is opened.

Finally, you can use Item panel on the right side of Print layout window and you can select any map element / item by clicking it from the list. Similarly, you may use Undo History tab.
