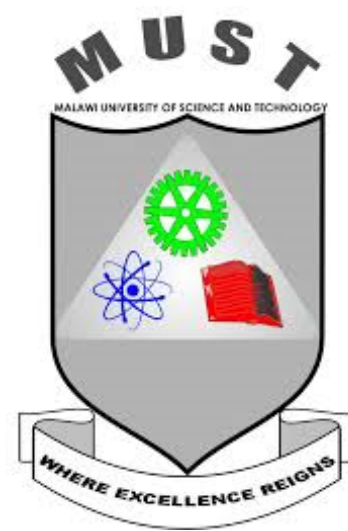# African Drone and Data Academy (ADDA)

## Data Visualization and Cartography Day
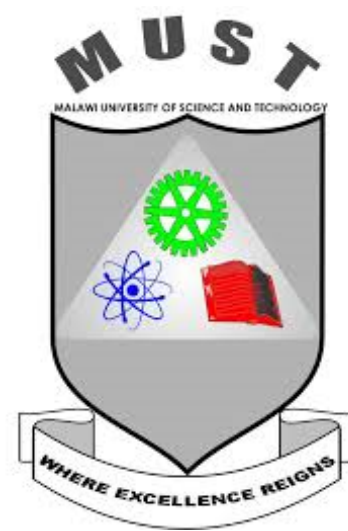
# DATA VISUALIZATION AND CARTOGRAPHY

## Map Elements and Map Template
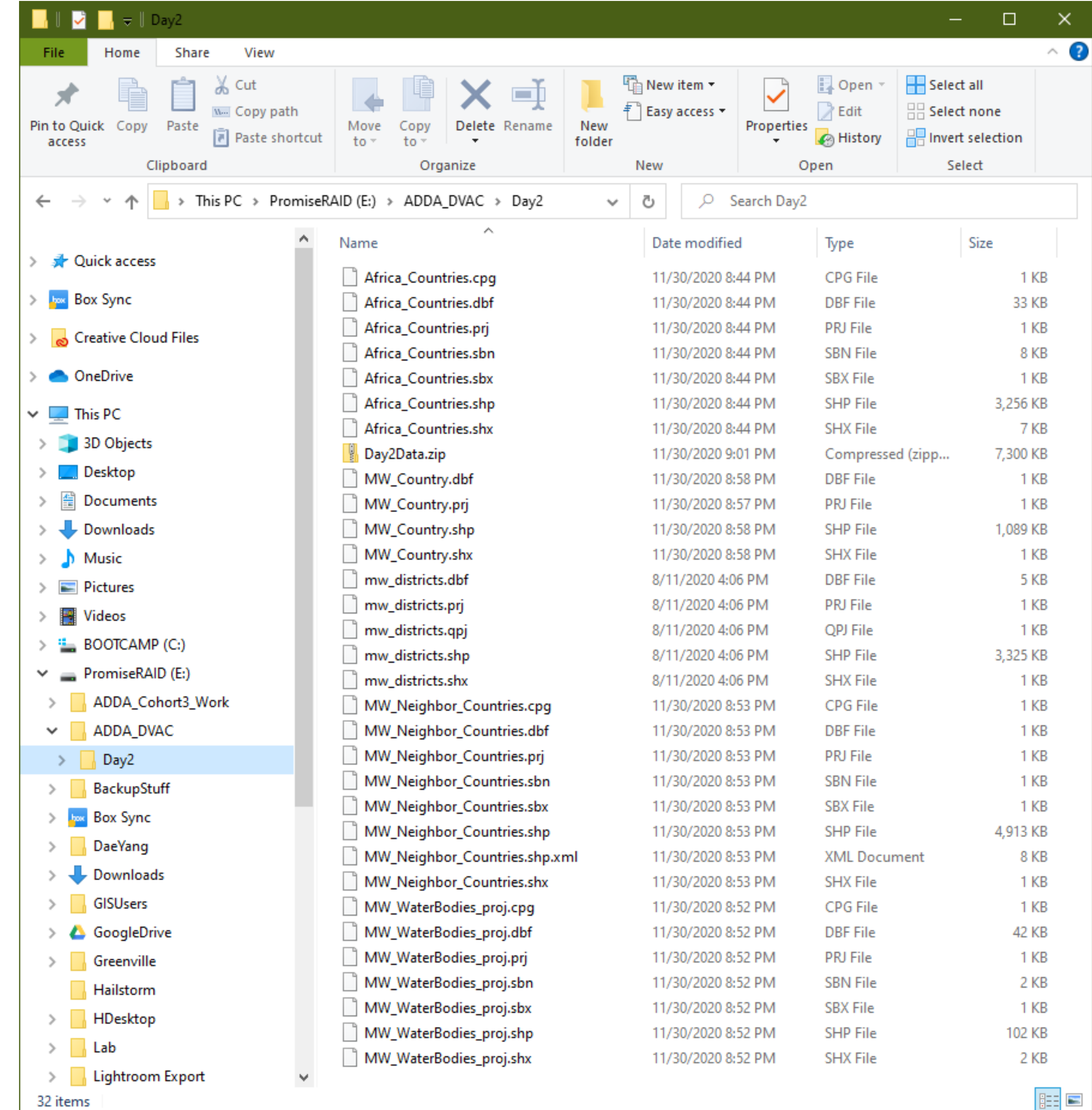
# Map Elements and Map Template

Today, we will focus on learning how to make a simple map with most of the critical map elements we have discussed in lecture.

Save your project as you make progress.  We will continue working on this project tomorrow but add more advanced features to the map tomorrow.

# Data Download and QGIS Start

- On Moodle, look for "**Day2Data**" link under Day 2 and click to download it.

- It should download **Day2Data.zip** file to your **Downloads** folder

- Move the zip file from **Downloads** folder to your **Day2** folder.

- Go to **Day2** folder and **Right Click** on **Day2Data.zip** and click **Extract All**
    - This folder contains several vector GIS data layers that will be used for the lab today that include:
        - Africa_Countries (Countries layer for African Continent)
        - MW_Country (Country Boundary for Malawi)
        - mw_districts (Districts Boundary for Malawi)
        - MW_Neighbor_Countries (Malawi's Neighboring Countries Boundary)
        - MW_WaterBodies_proj (Major Waterbodies in Malawi)

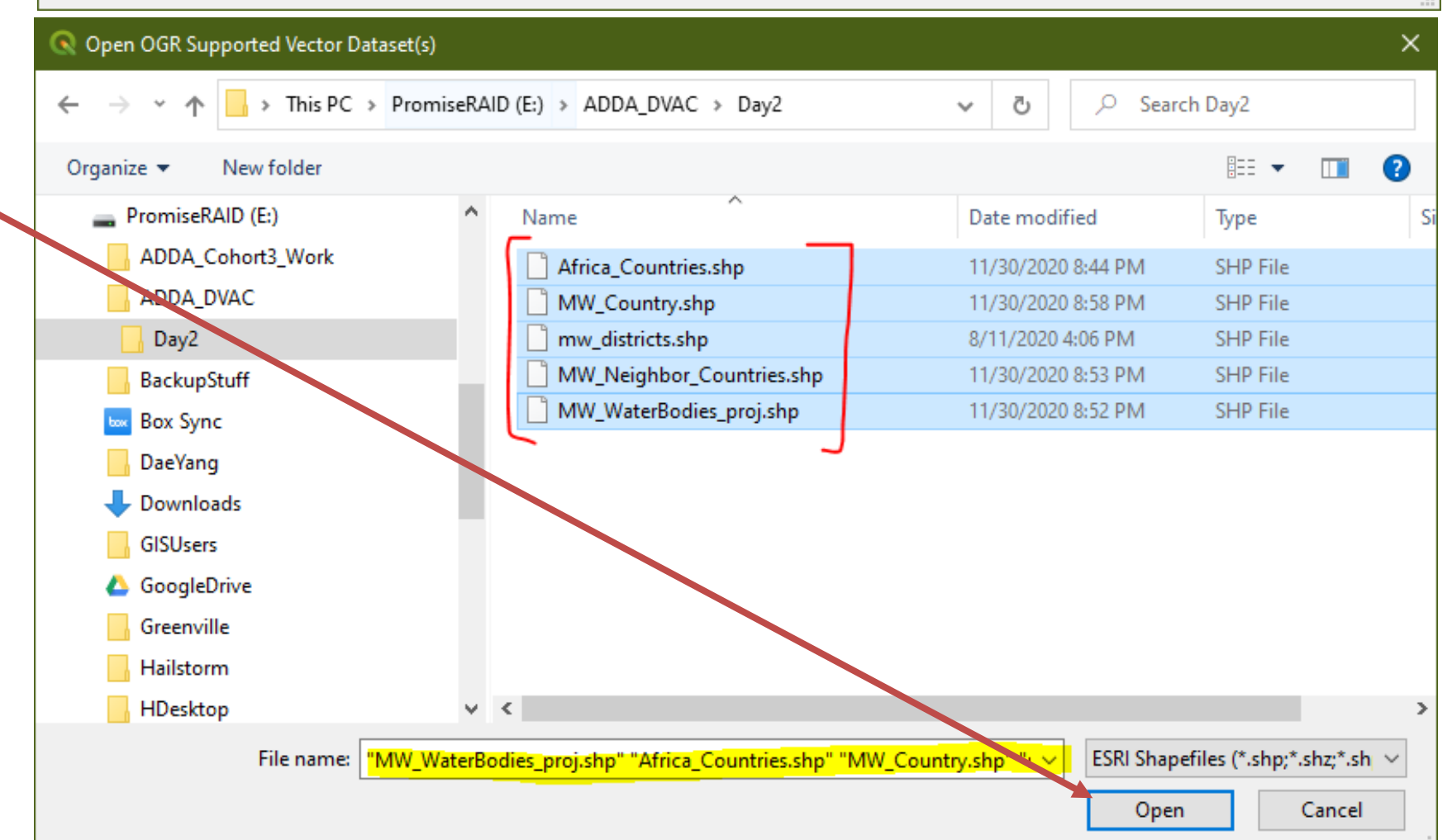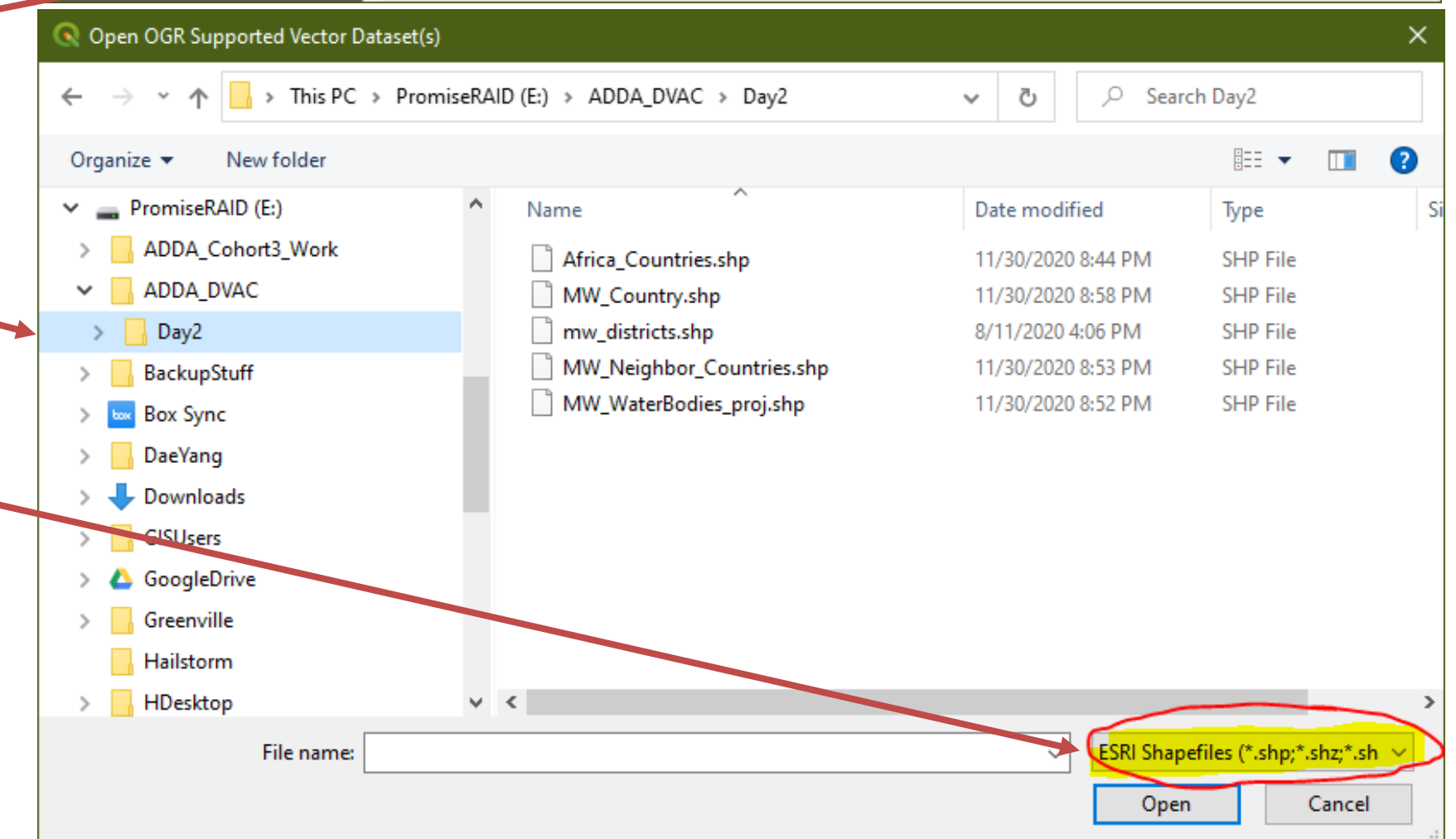- Click Start Menu on your computer and look for and open **QGIS Desktop 3.16.1**
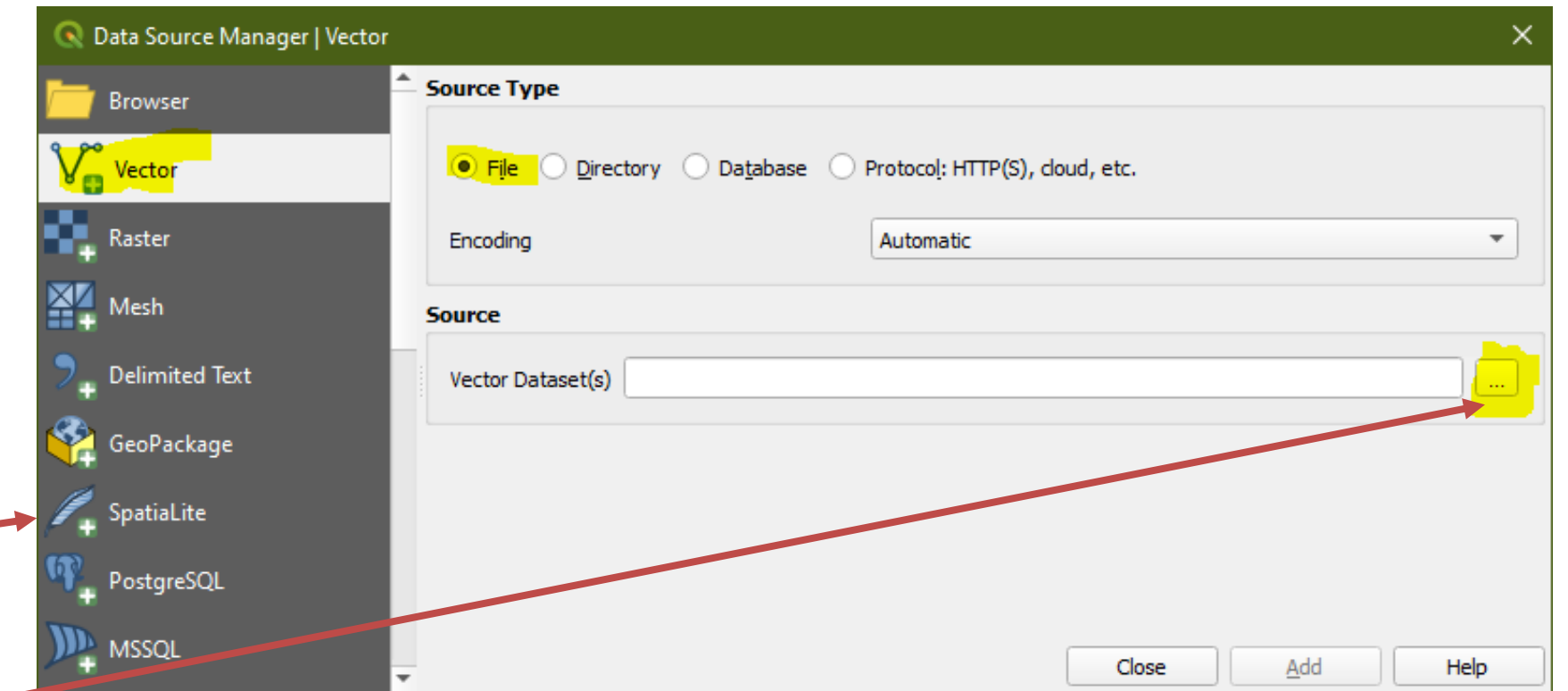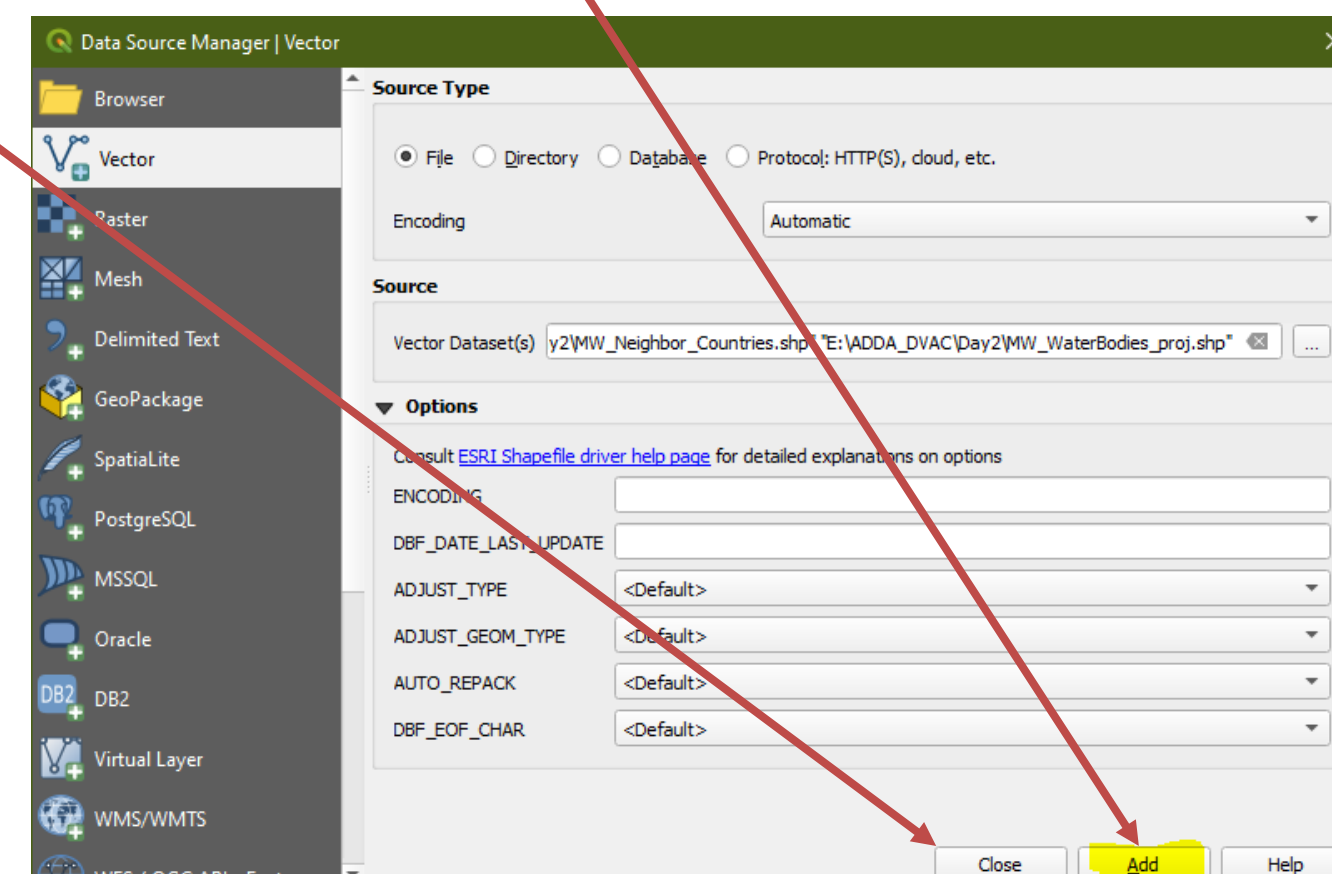
# Add Vector Data Layers

- From QGIS Menu, click **Layer → Add Layer → Add Vector Layer** option

- Data Source Manager Window will open

- In the **Vector Dataset(s) box,** click on the box with three dots

- It will open folder explorer to pick the files we want to open

- Under the file type box, select **ESRI Shapefiles**

- This will filter the data to only show the files with **.shp** file extension

- You can select all **.shp** files and click **Open**

- Back on **Data Source Manager**, click **Add** button

- In the background QGIS window, all the layers will get added

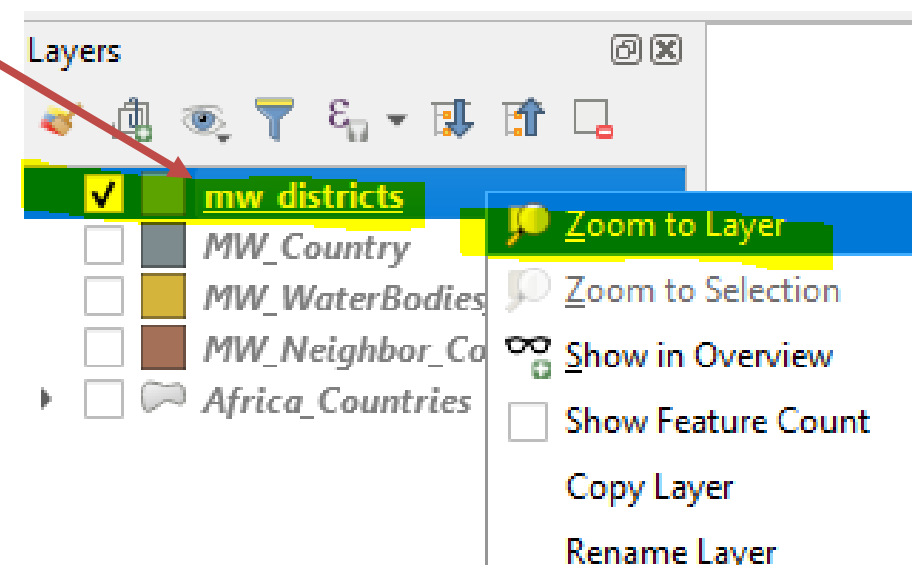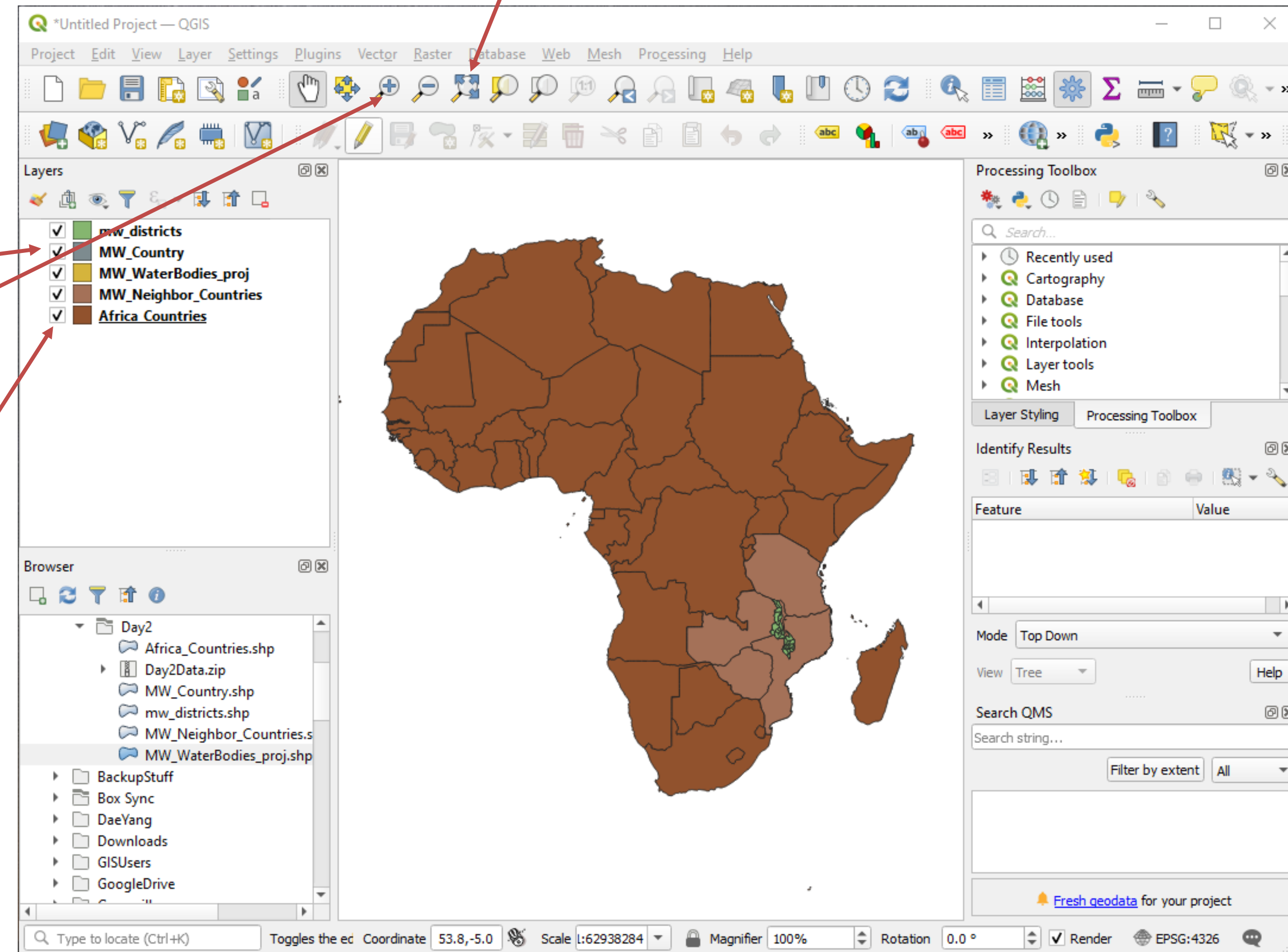- You can click **Close** and get out of the Data Source Manager

# Explore the Layers

- You should see five GIS layer files displayed in QGIS window
  - Note that colors assigned is random, and every time you do this, it might assign different colors to the layers.
  - If you only see African Countries layer and nothing else is visible where Malawi is, that is okay. They are hiding behind Africa Layer. We can fix it.
  - On the **Table of Contents**, you can move the layers and re-arrange their order. Click on any layer and drag them up or down to re-arrange their order to make it more like what I have here.
    - When you have point, line, and polygon data layers, it is best to put all point layers above line layers and keep the polygon layers at the bottom
  - Explore the layers, turn them on or off using the **check box**
  - Using the **Zoom buttons**, zoom in to Malawi and look at the layers
  - Let's turn **OFF** all layers except Malawi Districts
  - Right click on **mw_districts** layer and choose **Zoom to Layer** option

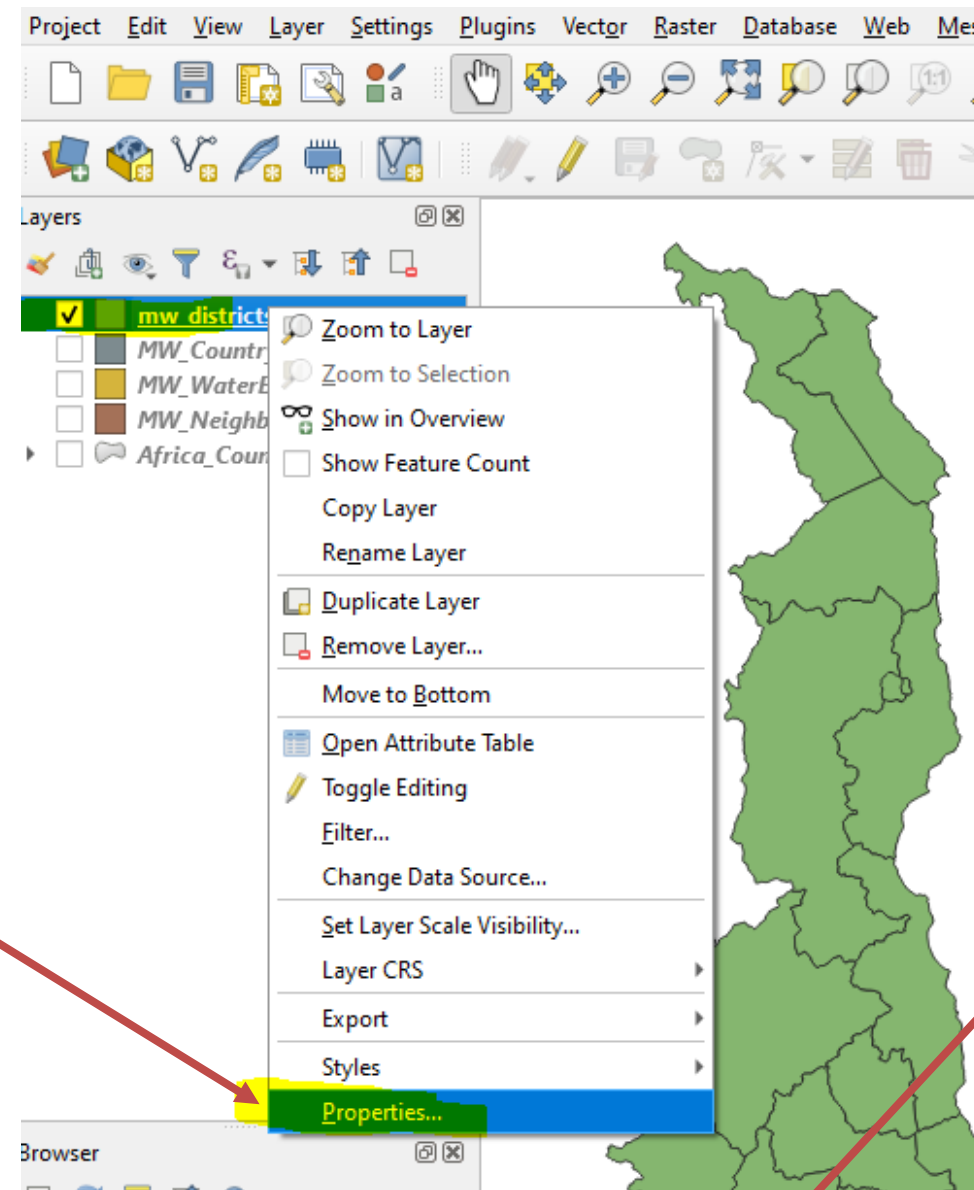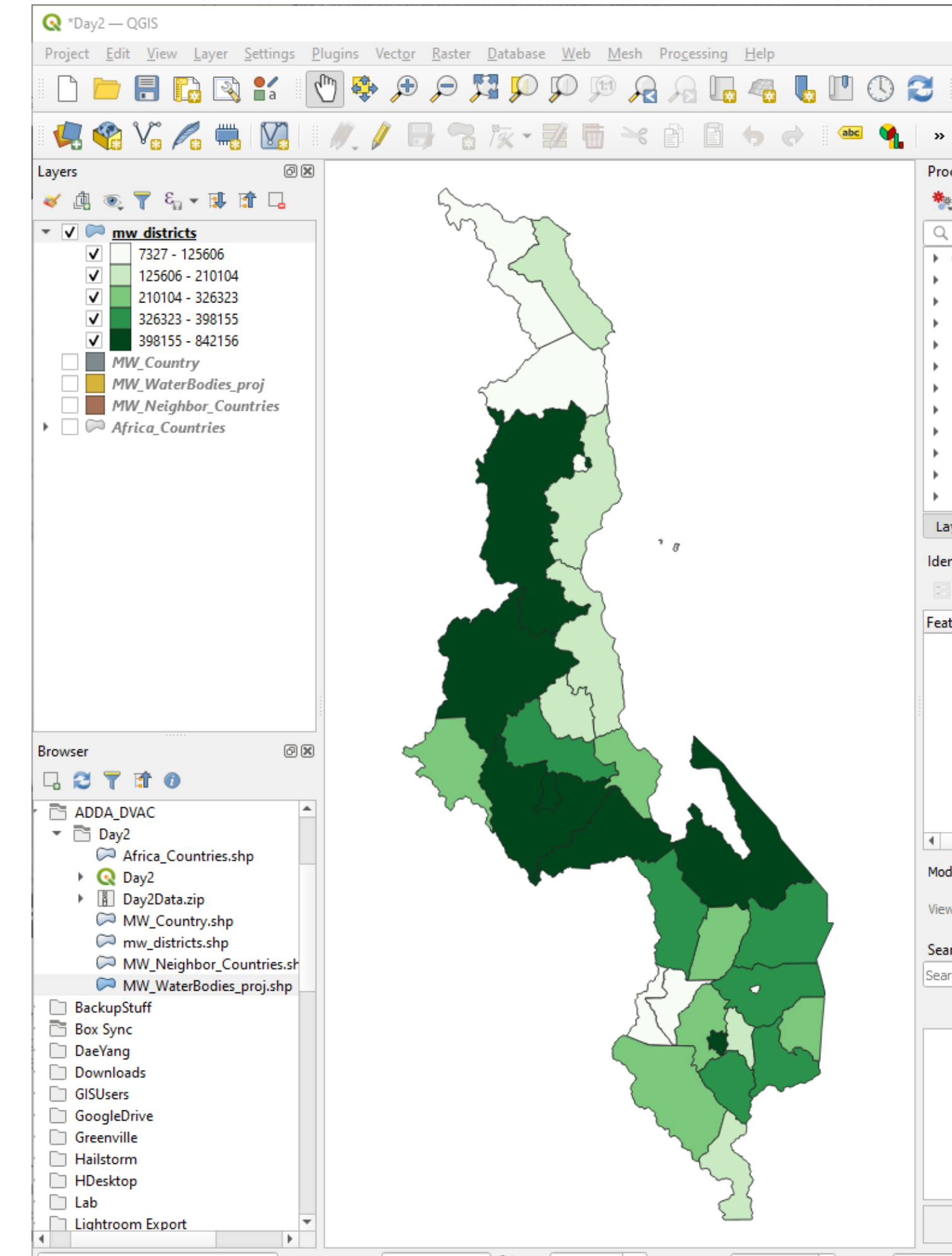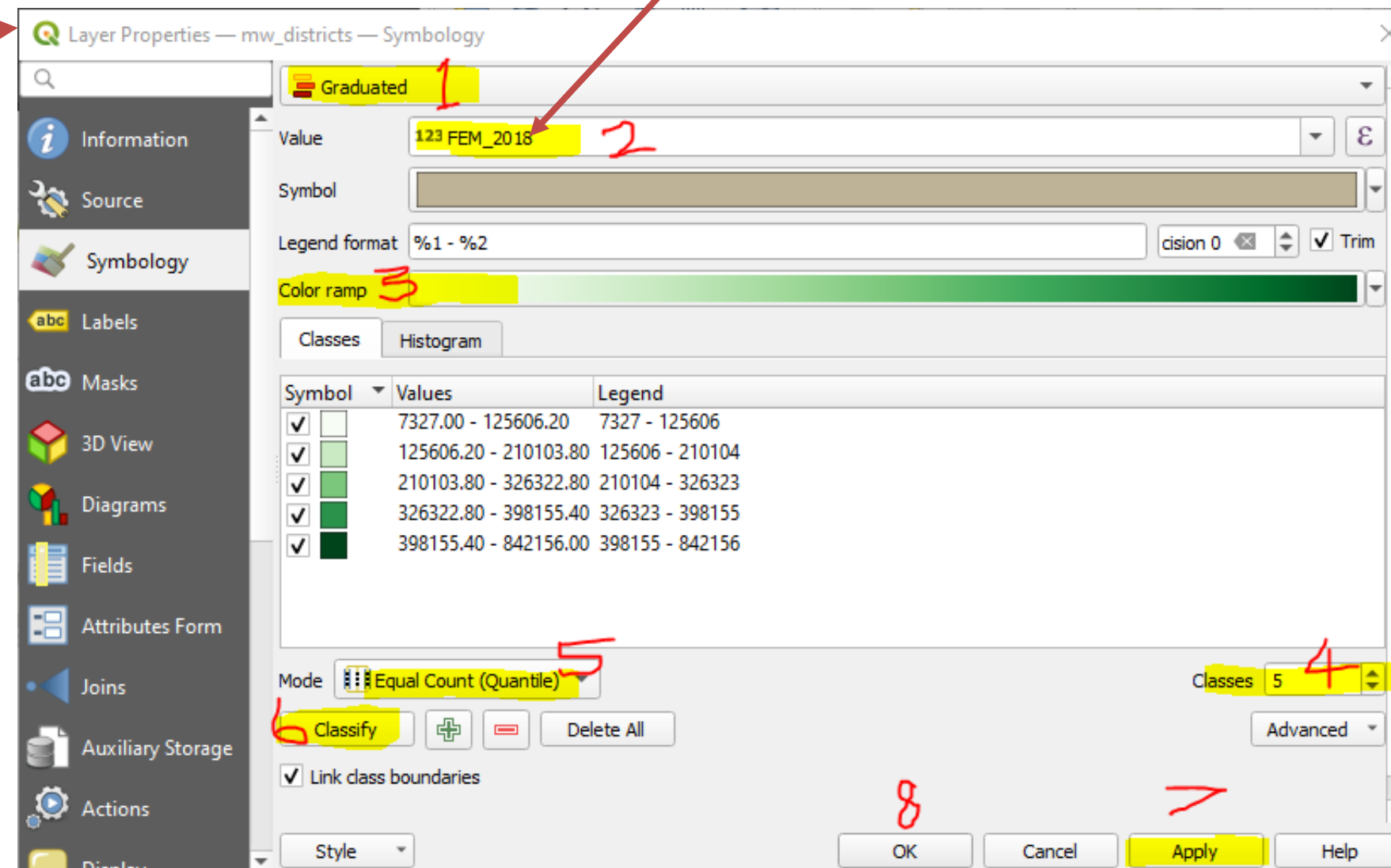This button will zoom you back to Full Extent of all map layers

# Symbolize Malawi Districts Layer

- Right Click on **mw_districts** → select **Properties**



The list of choices (called attributes) under **Value** come from the **.dbf** file
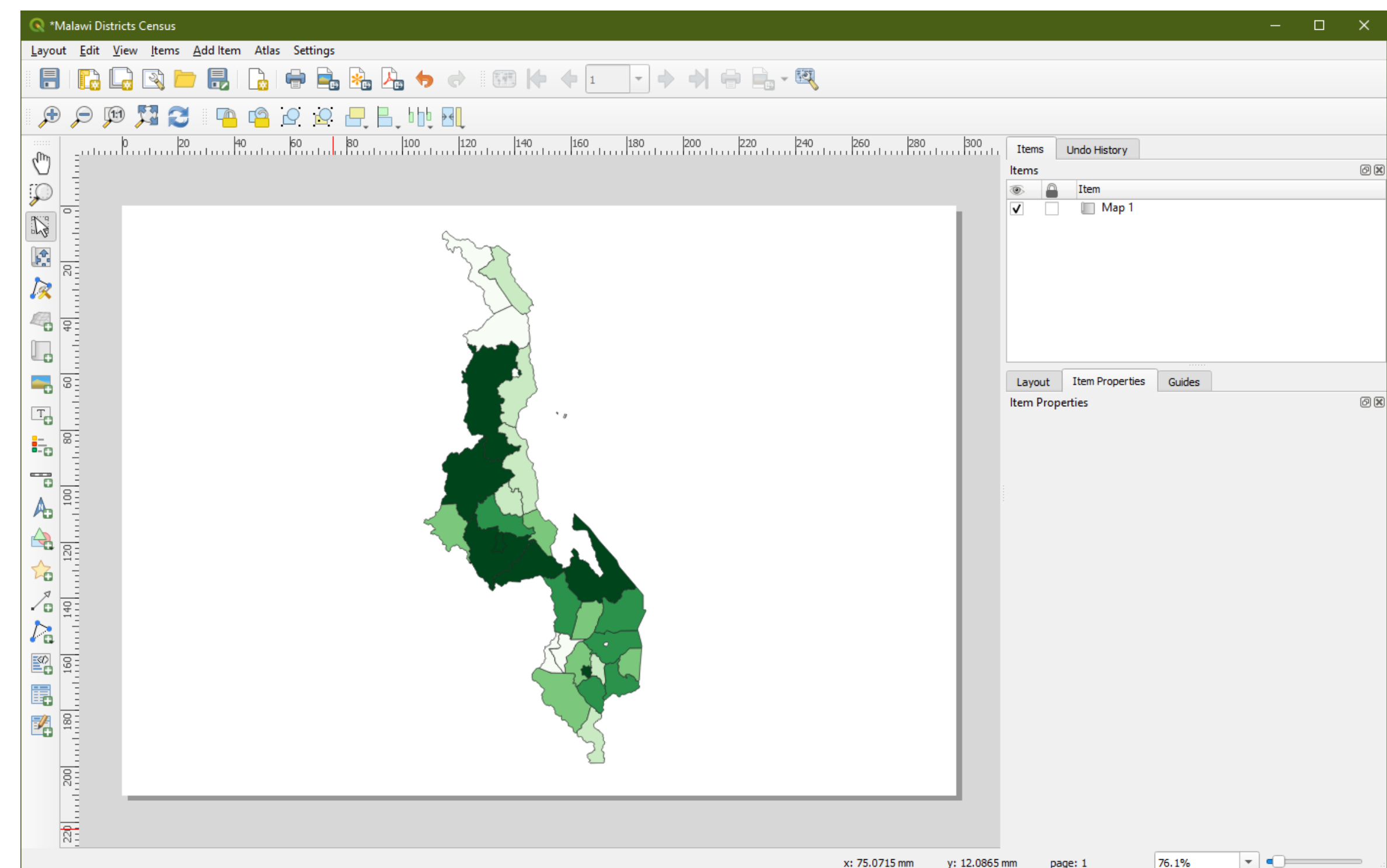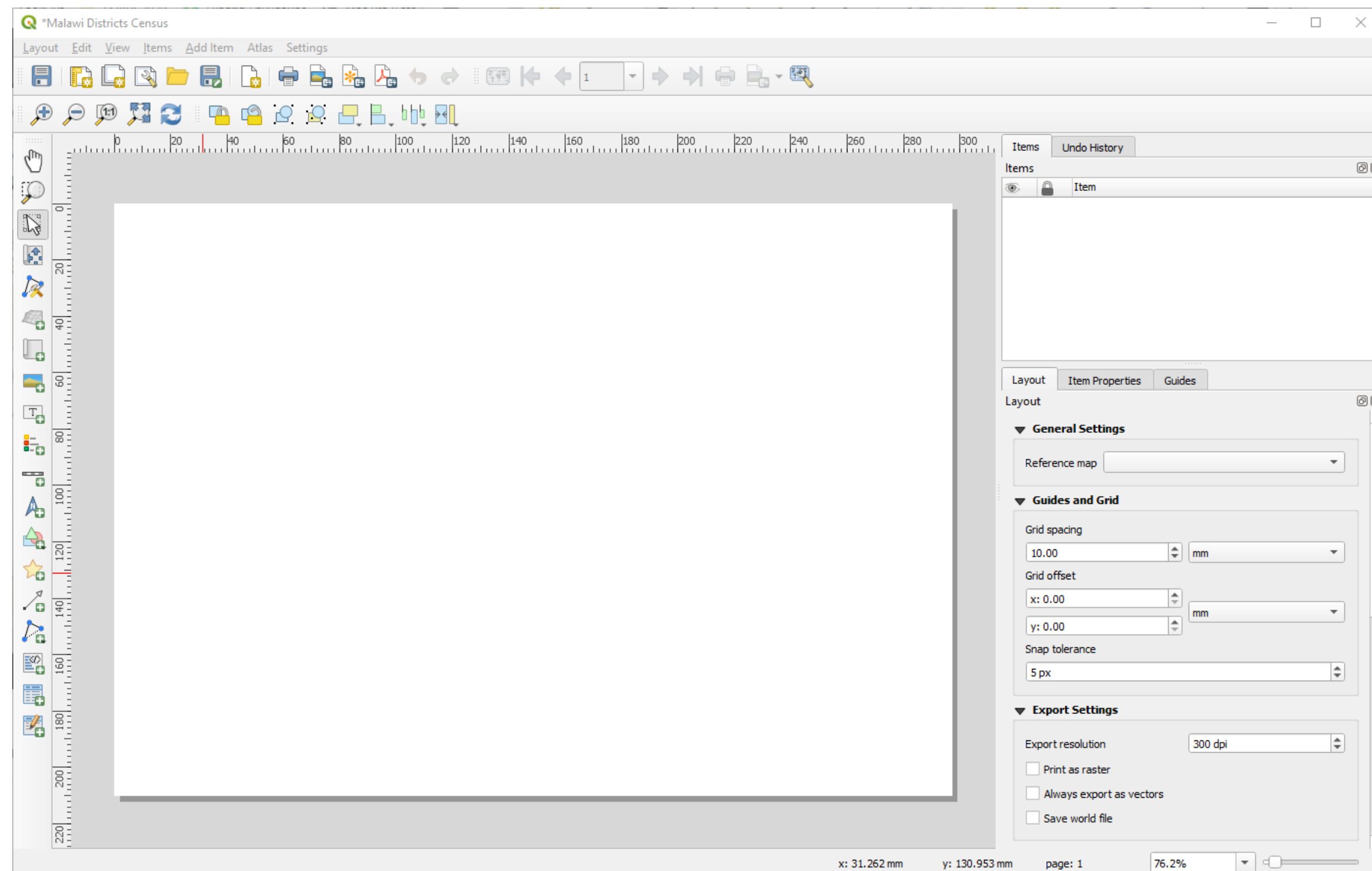
- In the **Properties** window, make the changes indicated by yellow highlights in the order the numbers are arranged

- When done, click **OK** and close the properties window

- Malawi map now represents a thematic map showing the number of Female by District

# Prepare Layout Template

- On QGIS, click **Project → New Print Layout…**

- You will be asked to provide a title/name for the layout

- When you have provided and clicked **OK,** a new map template will be created and appear

- On QGIS Print Layout window, click **Add Item → Add Map**

- The mouse pointer changes to +

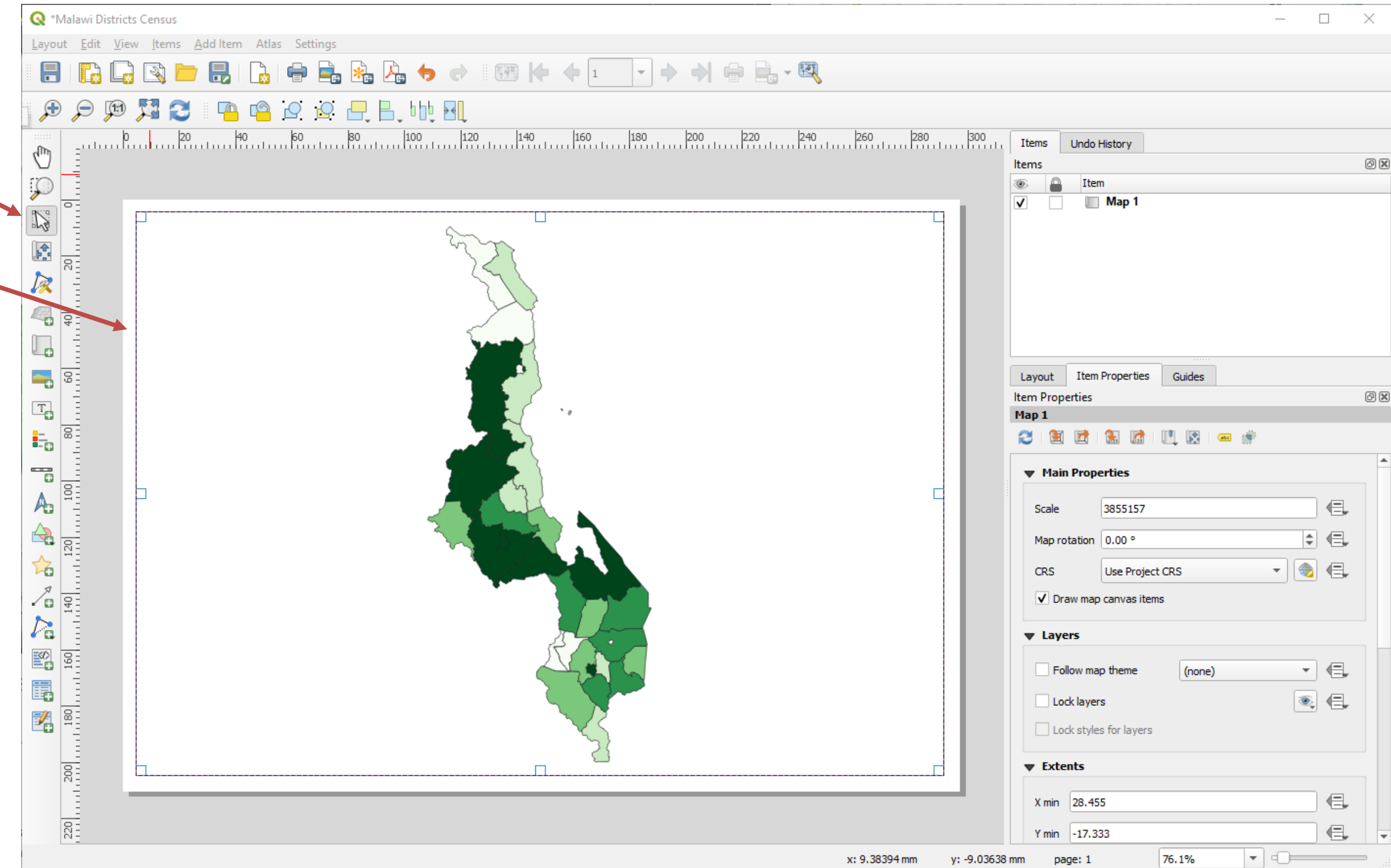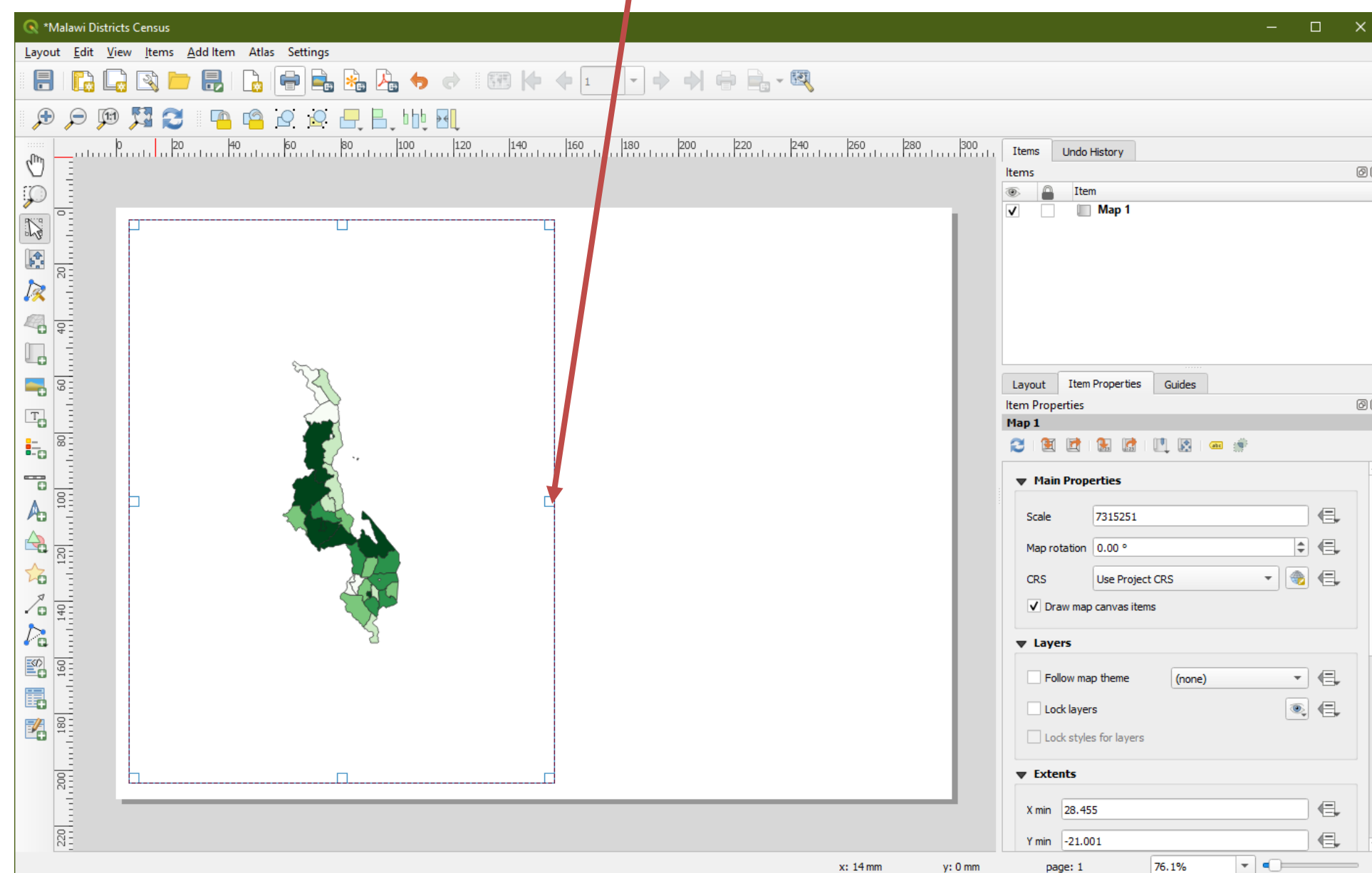- Click and draw a rectangle that nearly covers the map canvas
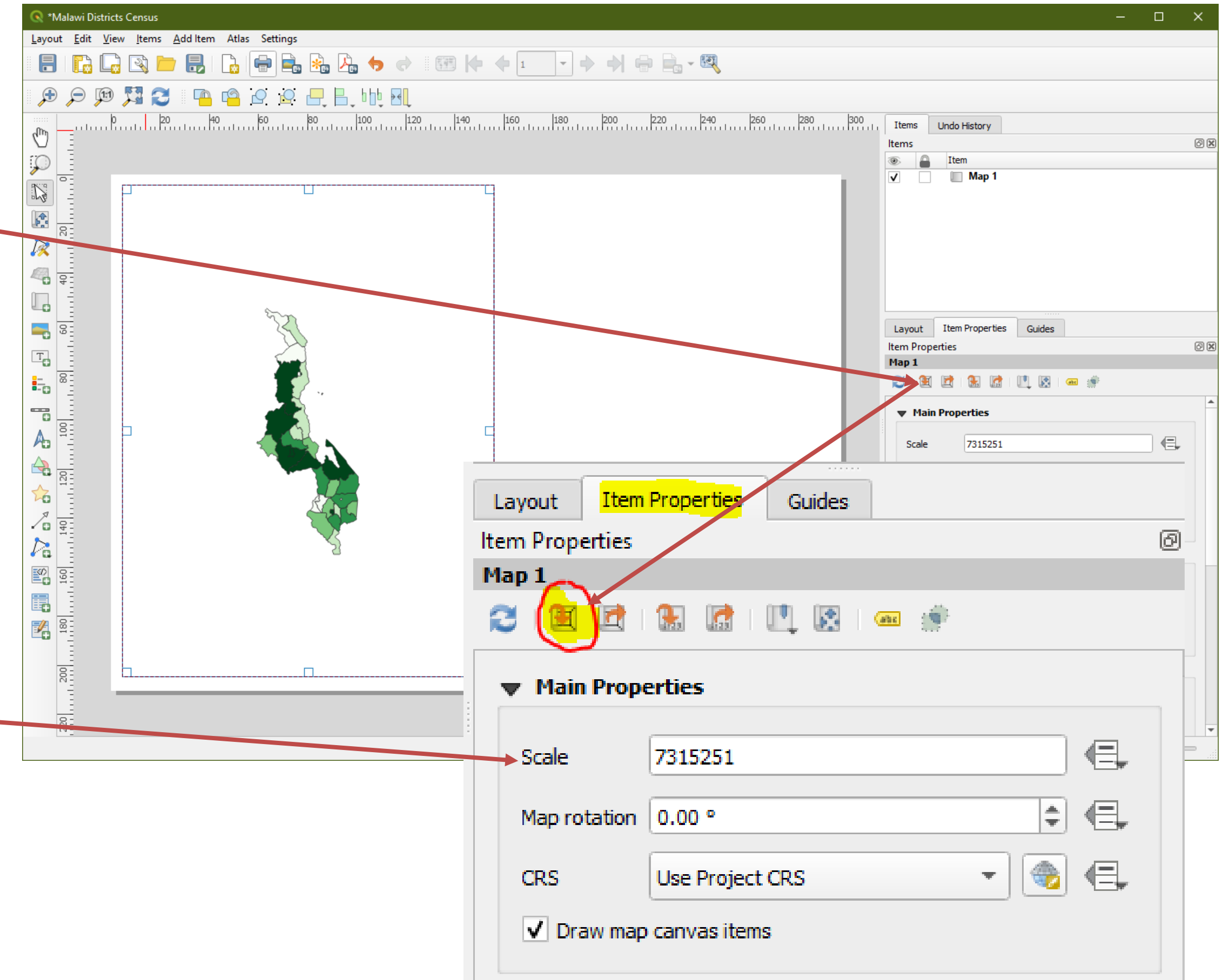
# Adjust the Map Layout

- Now, click on **Select / Move an Item** button on Map Canvas

- Click on the Map Item to select the map box that you just created. It will get selected.

- Now, holding the right edge of the map element, re-size it to fit half the window
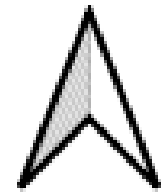
# Adjust the Map Layout

- With the map in the Canvas still selected, click **Set Map Extent to Match Main Canvas Extent** button under **Item Properties Tab**

- This will adjust the zoom level so that Malawi fits to the window size in the canvas

- You can also accomplish similar outcome by adjusting the scale value (increasing or decreasing the value in the scale box).
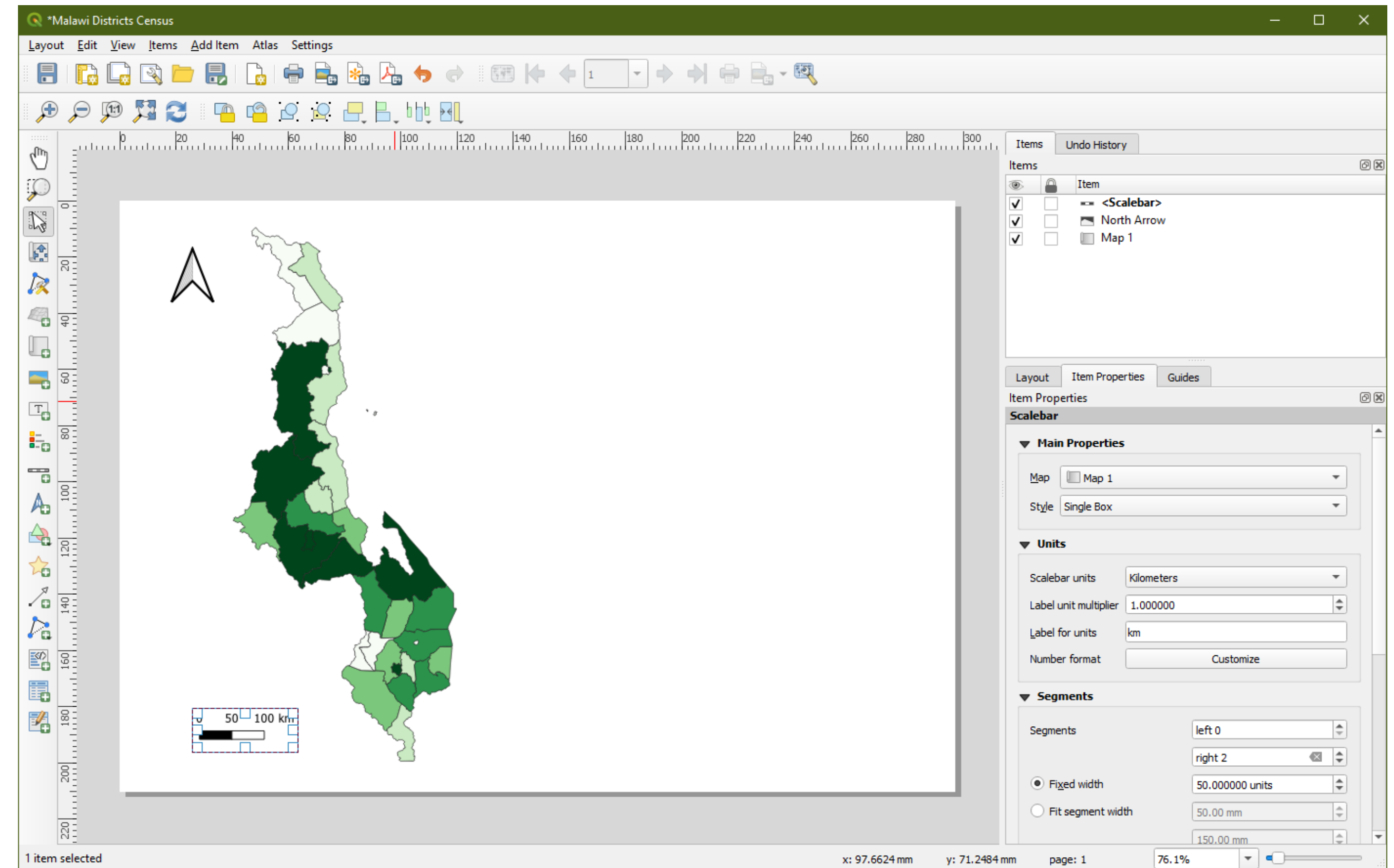
# Add Map Elements

- Click **Add Item → North Arrow**

- The mouse pointer changes to drawing mode +

- You should draw a small square or rectangle not more than few cm on both sides somewhere within the map canvas

- It will create a default North Arrow on your canvas

- Click **Add Item → Scale Bar**

- The mouse pointer changes to drawing mode +

- Draw a rectangle somewhere near the lower part of the canvas.

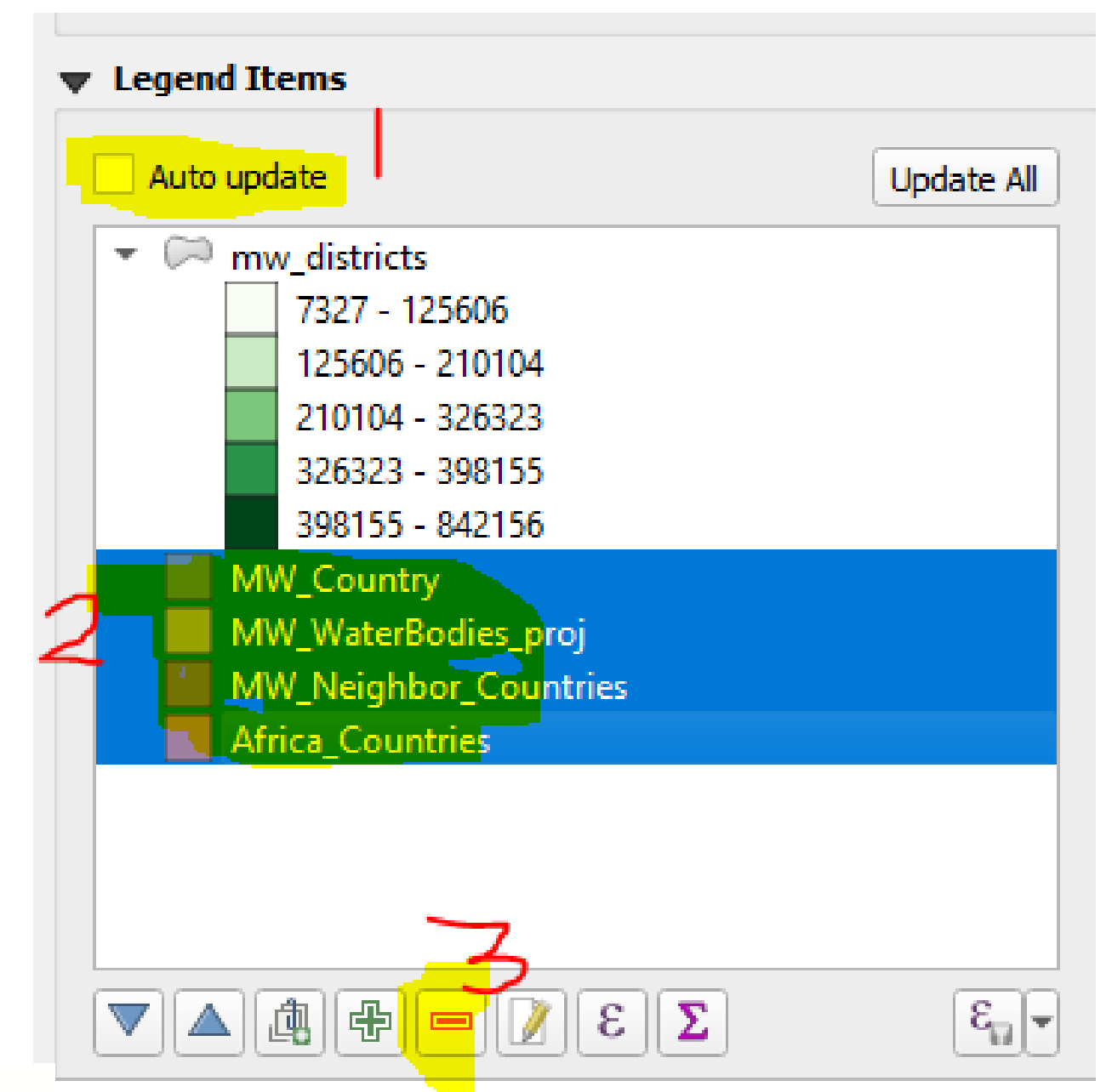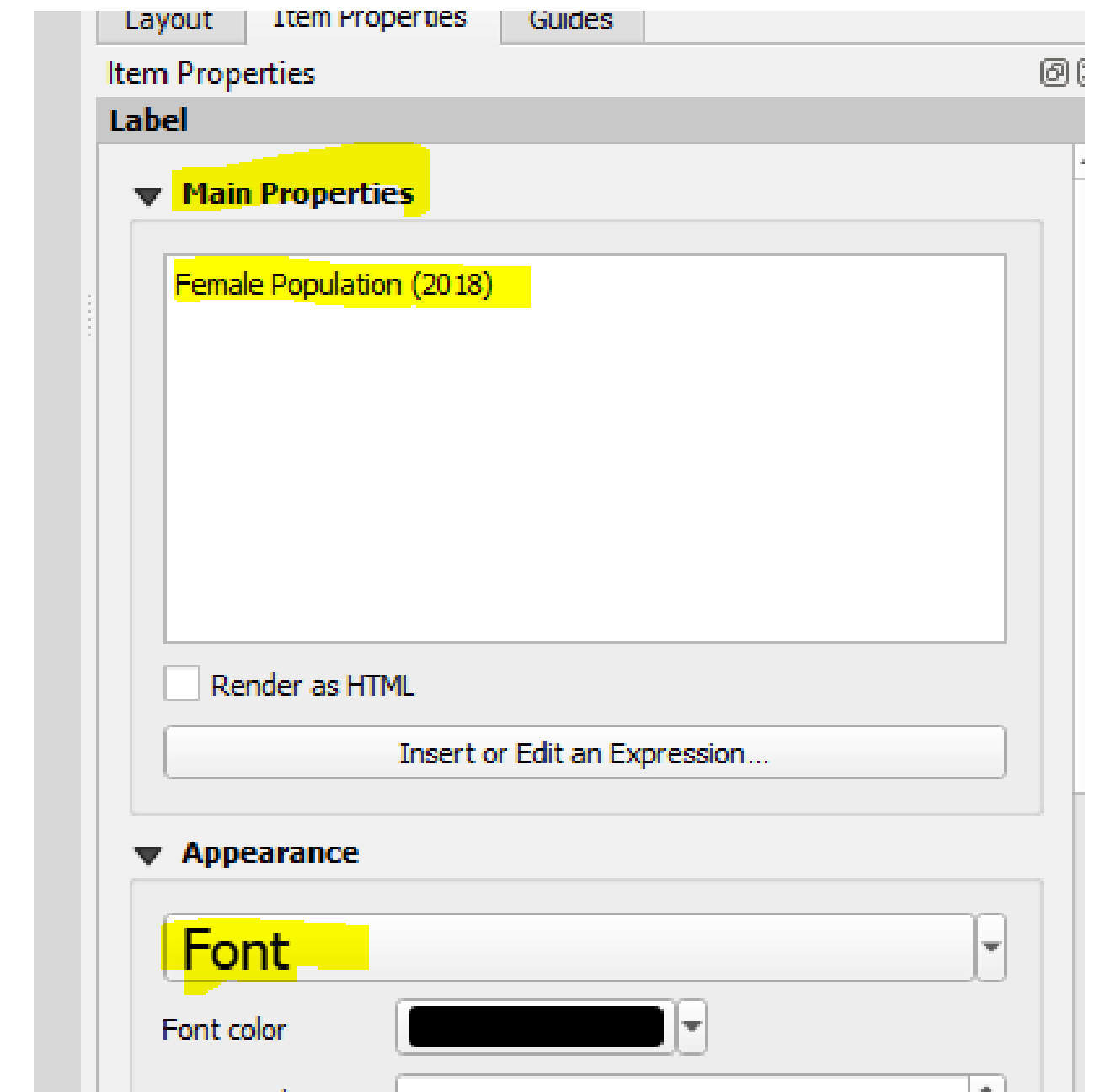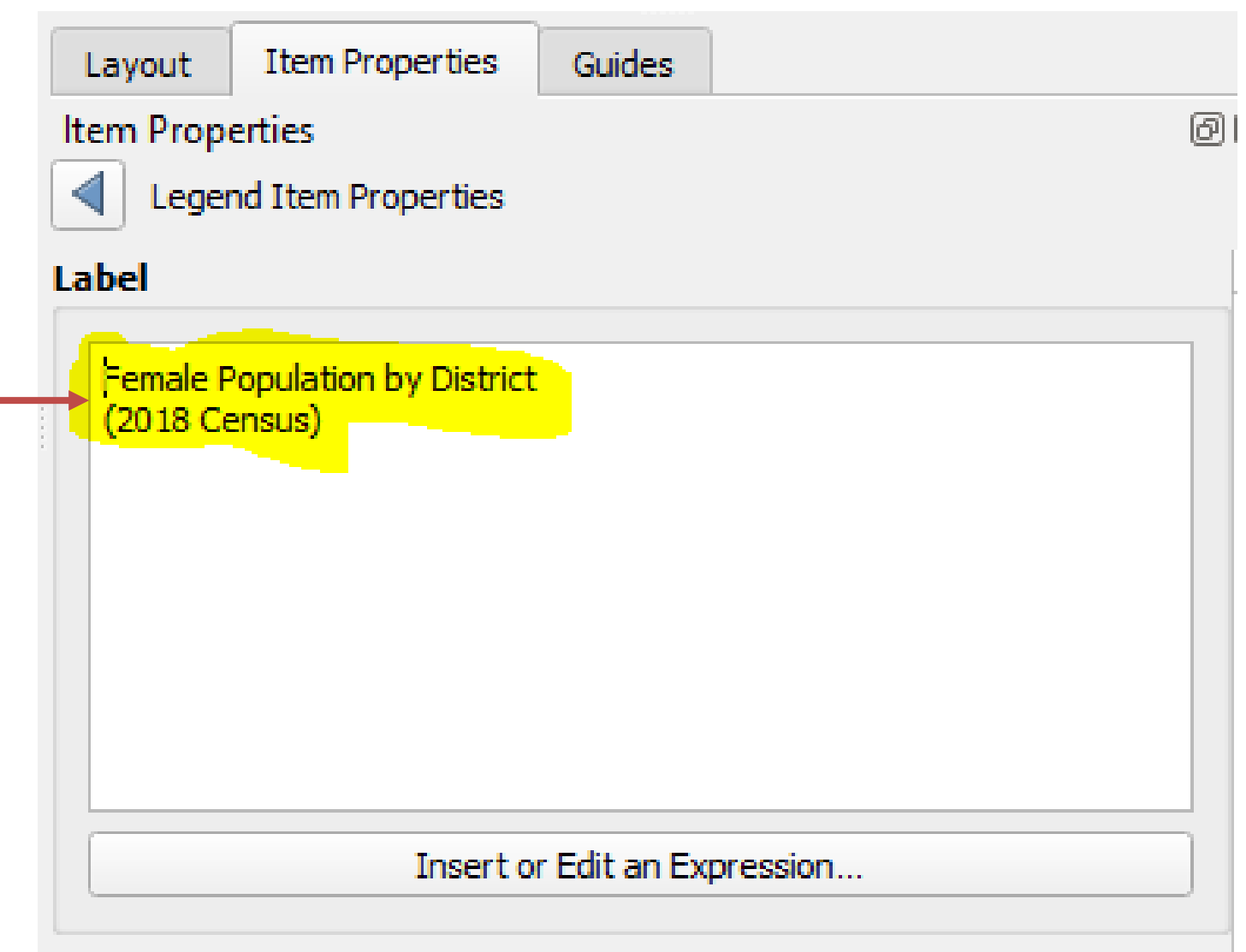- A scale bar with default distance units appears on the canvas
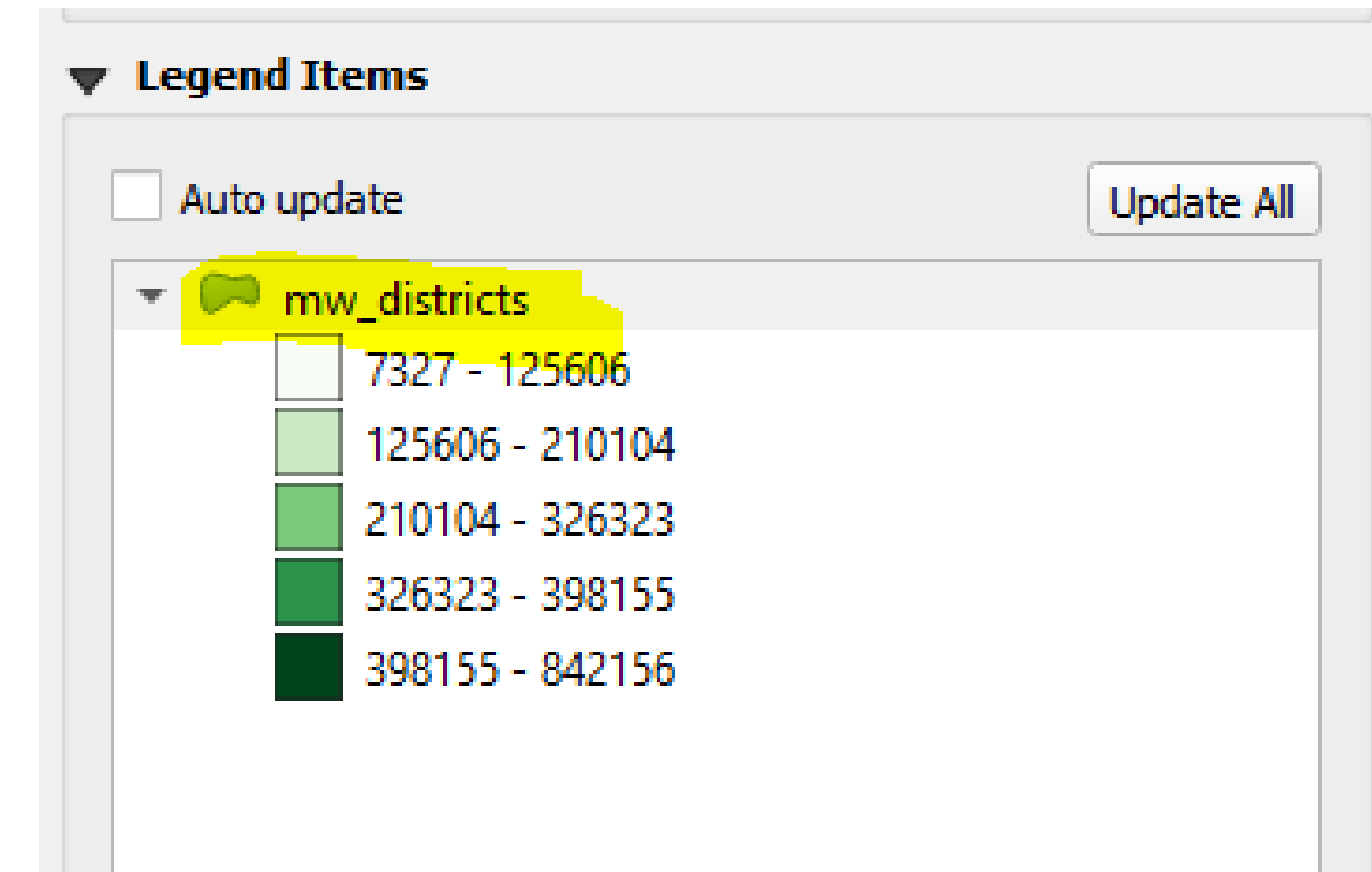
# Add Map Elements

- Click **Add Item → Add Label**
- The mouse pointer changes to drawing mode +
- You should draw a small rectangle near the top where we can enter the title for the map
- Drawing a rectangle creates an empty title box
- Under **Item Properties** window on the right side, type **Female Population, 2018**
- Adjust the **Font** size to make it appropriate for the map size.

- Click **Add Item → Add Legend**
- The mouse pointer changes to drawing mode +
- Draw a rectangle somewhere to the right of the Malawi map
- A legend with all layers that are on your QGIS project will appear.
- We don't need all layers listed there. We need only the districts layer and get rid of other layers.
- On the **Item Properties** window on the right, disable **Auto Update** option, then select the list of layers except mw_districts, and hit – button at the bottom to remove those layers from the legend entry
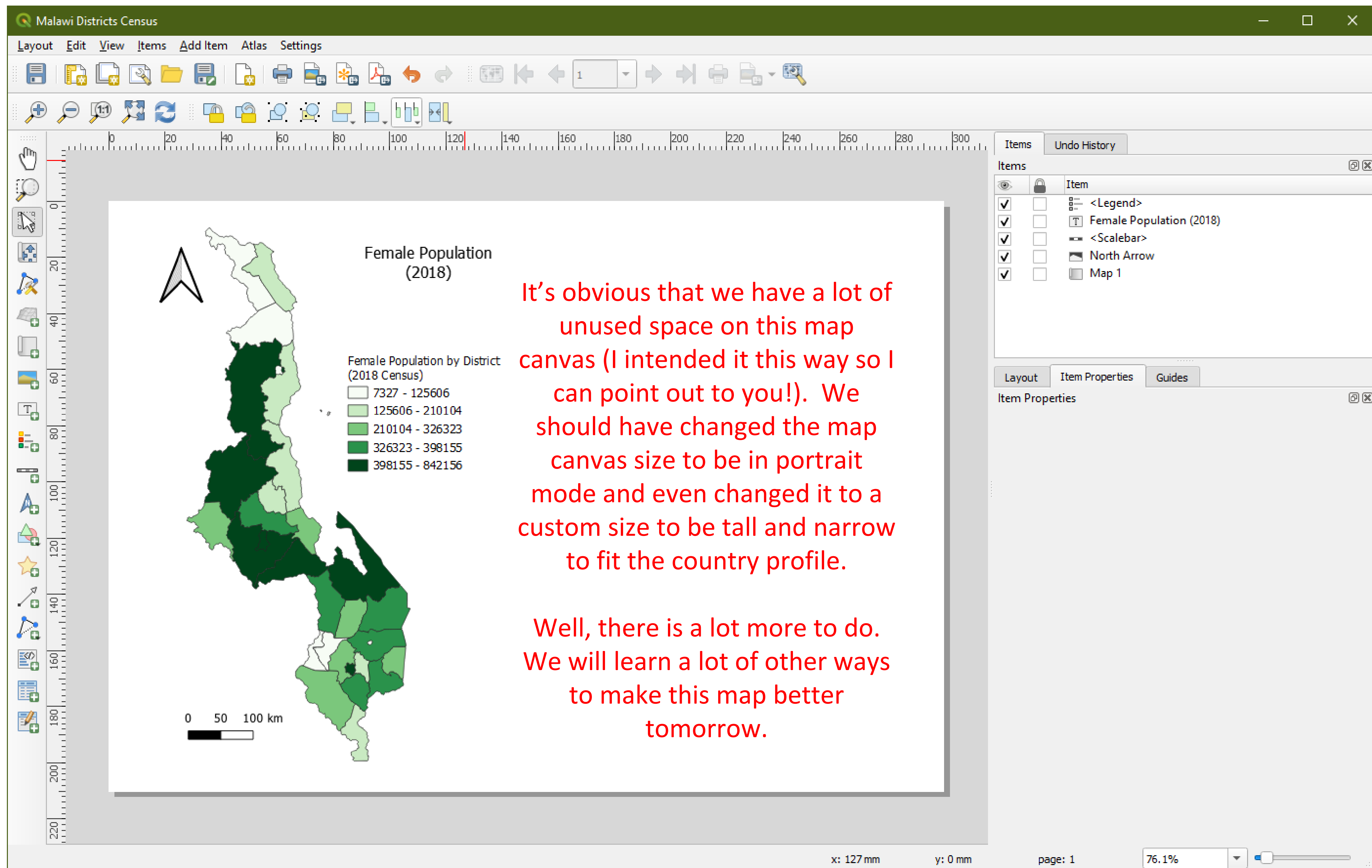
# Add Map Elements



- Let's clean up the legend more
- Double click on the word **mw_districts** under the legend items box on the right



- Type "**Female Population by District**" press enter to get to the next line, then add **(2018 Census)** as shown in the example here

- Now, make sure to save your project.  Even if you close the project now, you can get back to the template and start from where you left.  All map templates are stored within the project.

- On QGIS main window, click **Project → Layout Manager** to see your existing layouts.

**Let's Look at Your Very First Map!**

It's obvious that we have a lot of unused space on this map canvas (I intended it this way so I can point out to you!). We should have changed the map canvas size to be in portrait mode and even changed it to a custom size to be tall and narrow to fit the country profile.

Well, there is a lot more to do. We will learn a lot of other ways to make this map better tomorrow.

# End of Map Template
# Design Overview and Practice

Nice work!

What do you feel you did well?  What would you have liked to do with the map to make it look better?