Data pre-processing in QGIS

Note: For functions described below you need Semi-Automatic Classification Plugin (SCP) to be installed. It is completely free, you may install it using Manage and Install Plugins tool (Figure 1).
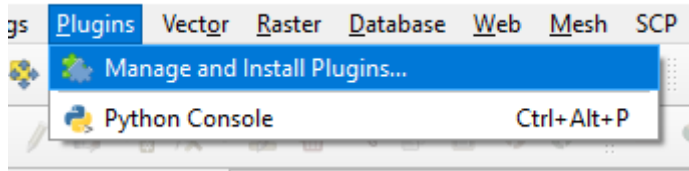

Figure 1. Manage and Install plugins option within QGIS.

To explore other functions of this plugin visit the full documentation: https://readthedocs.org/projects/semiautomaticclassificationmanual/downloads/pdf/latest.

Content

Data loading

To load the data into QGIS choose *Add Layer*, and then *Add Raster Layer*. *Data Source Manager* window appears. Leave "File" selected like it is in default. Under *Datasets,* you can navigate to the data directory. You may load more than one file (e.g. all needed satellite bands), see Figure 2.
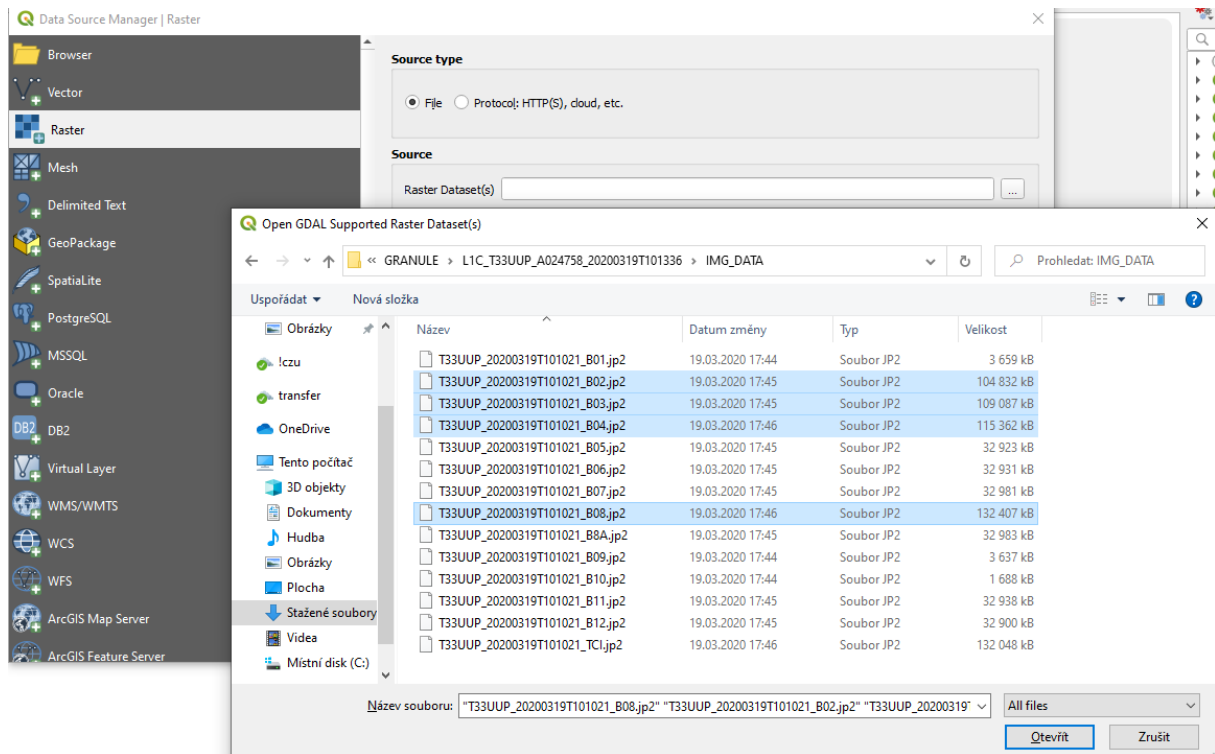

Figure 2. Raster data loading.

Adjusting the extent (data clip)

Since the area of the picture is very large it is reasonable to work with just a section of the image (i.e. clip the data and only work with a part of the image). Navigate to the *SCP* button and under *Preprocessing* tab you find *Clip multiple Raster*. To clip the data, press the orange button with the plus and define the area you want to work with while clicking with the right button on your mouse. After defining the section under *Clip coordinates* there should occur coordinates (Figure 3). Click *RUN* and define an output folder. *Note: Layer you want clip have to be loaded in the Band set tab.*
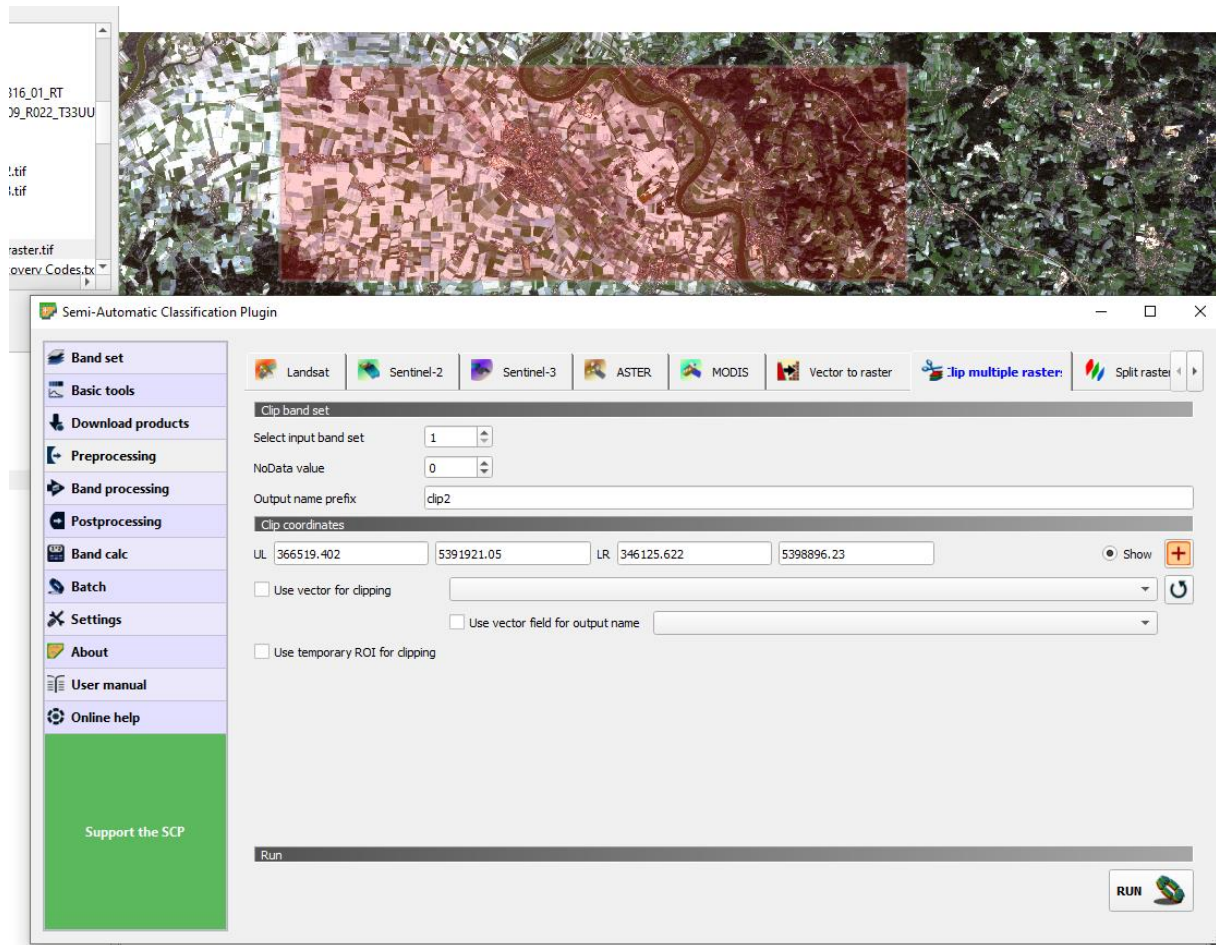

Figure 3. Clip the extent of imagery.

Creating a stack

You may want to create a layer stack, i.e. from several bands create one band-set. Once you have a layer stack, you can create colour compositions (i.e. true or false colours). Navigate to the *SCP* tab and select *Band set*, within *Multiband image list* you can load the images you want to stack together. Under *Quick wavelength, units* select the proper satellite sensor. As you see, the layers have numbers (e.g. B01) which are the band numbers. Make sure the bands are in the order you want (should be in ascending order) and that you have checked option *Create raster of band set*, see Figure 4. *Note: It takes some time to create a layer stack. The new layer should be added automatically to your Layer list.*
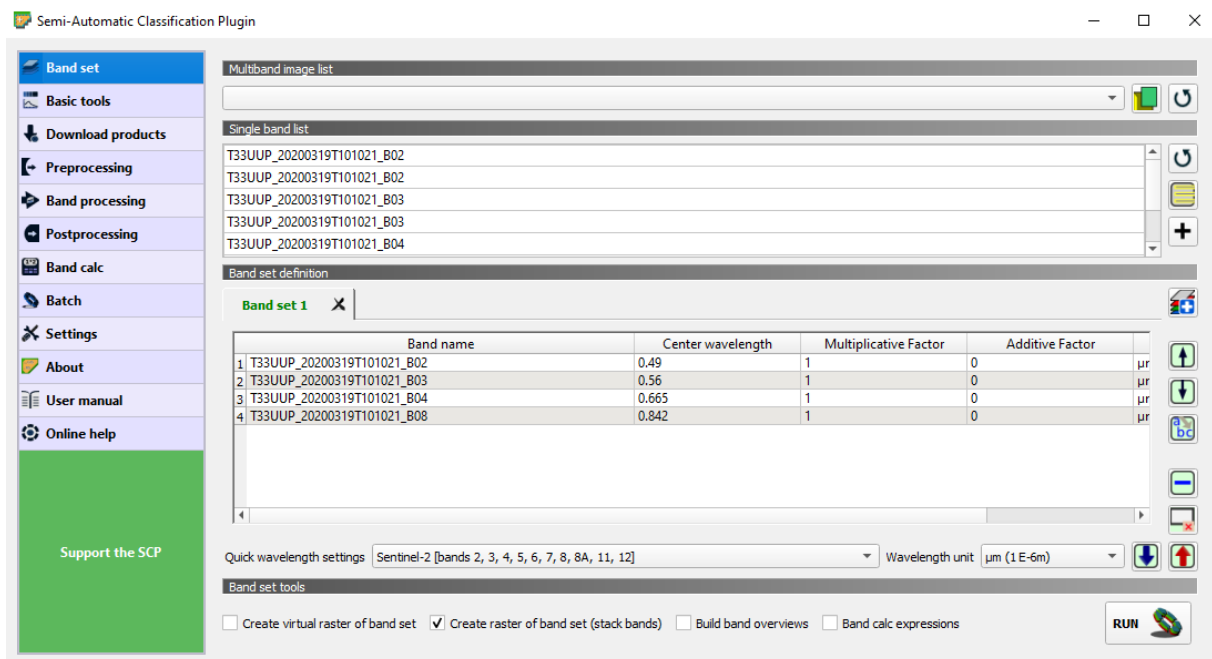

Figure 4. Layer stacking - creating a band- set from bands 2, 3, 4, 8 of Sentinel 2.

Colour compositions

Once you have a layer stack, you can create various colour compositions (true or false). True colour composition means the colour of your image looks naturally (like you can see them by your eyes). It means you load into RGB composition the bands in the right order (red band to the red channel, green band to the green channel and blue band to the blue channel), that's true colours. But you may create false ones, e.g. to better distinguish some phenomenon (Figure 5). You can set and change the colour composition in *Layer properties – Symbology* (Figure 6).

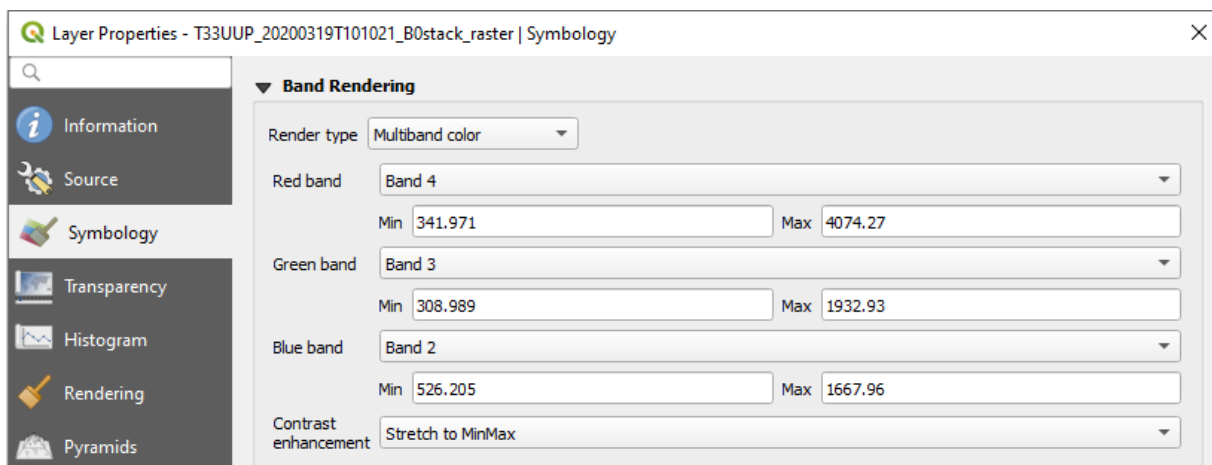*Figure 5. Various colour compositions: true colours (R-G-B) on the left and false colours (NIR-R-G) on the right.*

Figure 6. Symbology options of the layer.