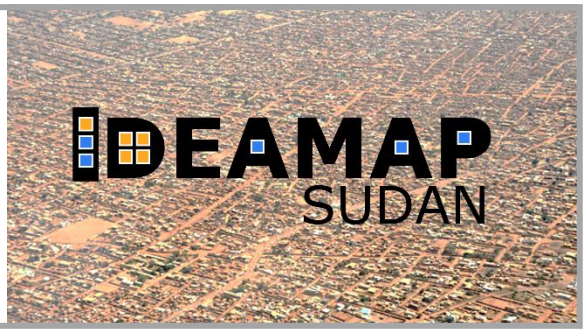
Accuracy Assessments

Practical Exercise



General Information

Goal:

- Assess the accuracy of a supervised classification

Content:

- Accuracy assessment
- Improving classification results.

Software Requirements:

- QGIS
- The "dzetsaka" QGIS plugin (see instructions in the practical exercise Part 1)
- The data for this practical which can be downloaded from Canvas.

New for Part 2:

- The "AcATaMa" QGIS plugin (see instructions below).

Data to be used:

- **ESACCI-LC10-Map-20m-2016-MLPractical.tif** – Land cover dataset raster
- **ESACII-LC-colormap.clr** – QGIS style for the Land Cover dataset
- **S2_20170101_Year_20m-MLPractical.tif** – Satellite imagery
- **MLPractical_Training_Points.geojson** – Training points
- **CCI_L10_Training_Points_Style** – QGIS style for the training points

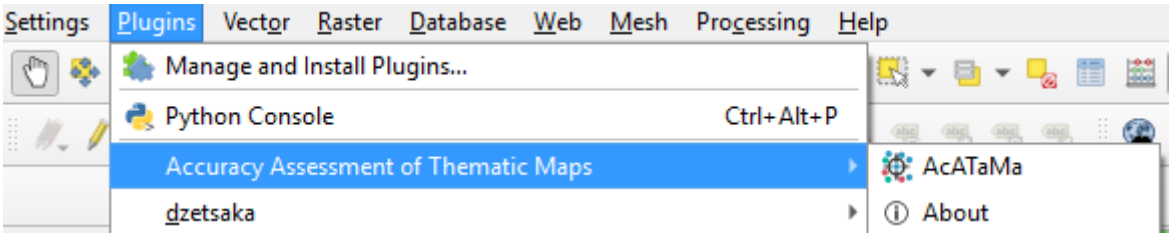
New for Part 2:

- Your classification layer from Part 1 (you can use **MLPractical_ExampleClassification.tif** if you didn't save yours)
- **MLPractical_Reference_Points.geojson** – Testing data points
- **MLPractical_Reference_Points_atacama.yml** – Description of testing points for the Atacama plugin.

Software Installation

We will be using QGIS as you installed in Topic 2. You will also need to install the dzetsaka plug-in in QGIS (instructions in the Machine Learning Part 1 practical exercise).

We also need the "Accuracy Assessment of Thematic Maps" plugin. In the top menu of QGIS, select "Plugins" → "Manage and Install Plugins". Then type **AcATaMa** in the search bar. Select it and then install (or upgrade) the plugin. After it is correctly installed you should see it under the list of installed plug-ins and in the Plugins menu like in the screenshot below.

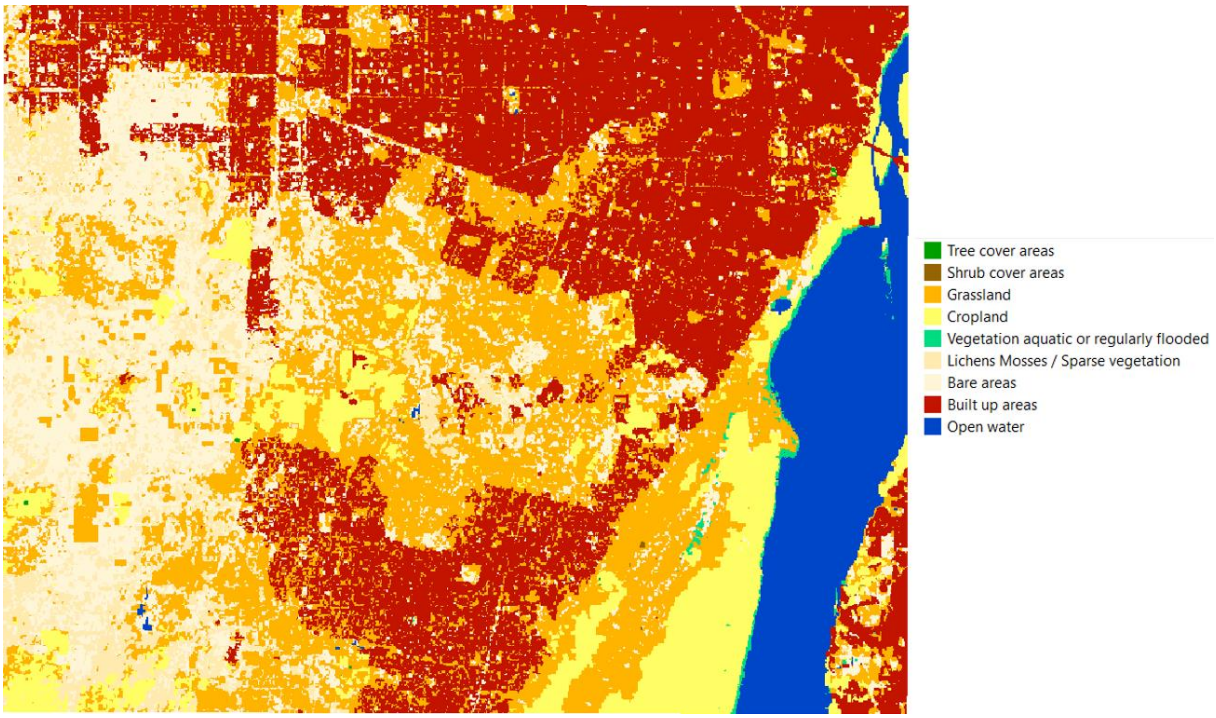


A detailed description of it can be found here: https://smbyc.github.io/AcATaMa (last accessed 07.06.2021).

Datasets

Reference data

We will be using Land Cover data from the **CCI Land Cover dataset**. It has a spatial resolution of 20m and was generated from one year of Sentinel 2A observations from December 2015 to December 2016. More information can be found here: http://2016africalandcover20m.esrin.esa.int/ . A part of Khartoum was subsetted for this practical exercise.



Input data

The classification will use a **Sentinel 2a image** mosaic of 2017. The input bands 2 – 8A are available.

Training samples:

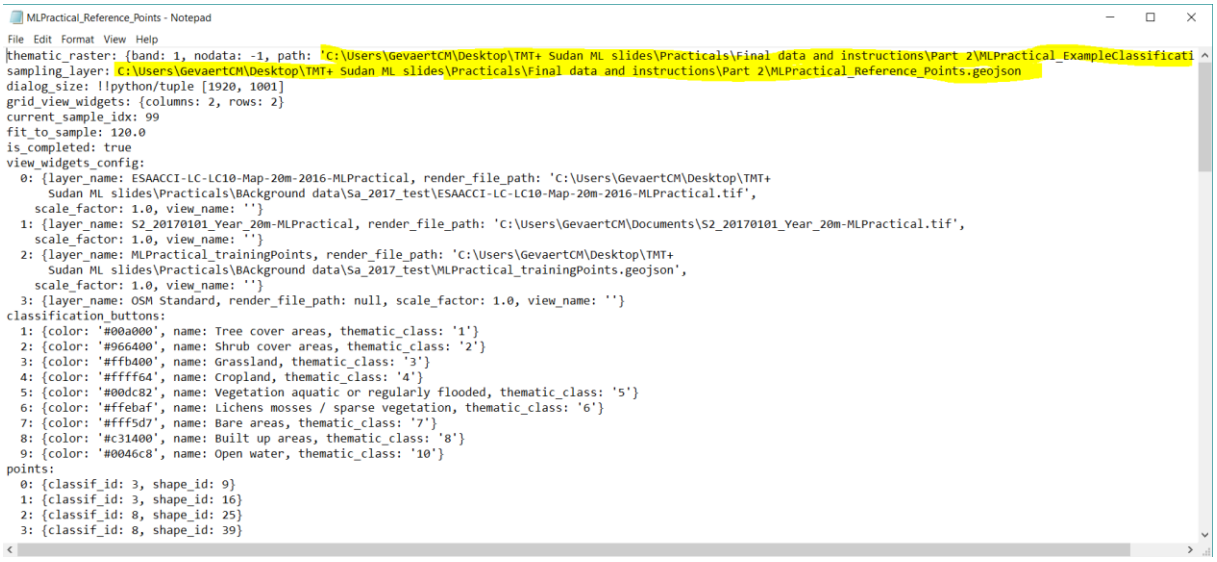
To train the classifier, 150 points were randomly selected and labeled according to the CCI land cover layer.

Testing samples:

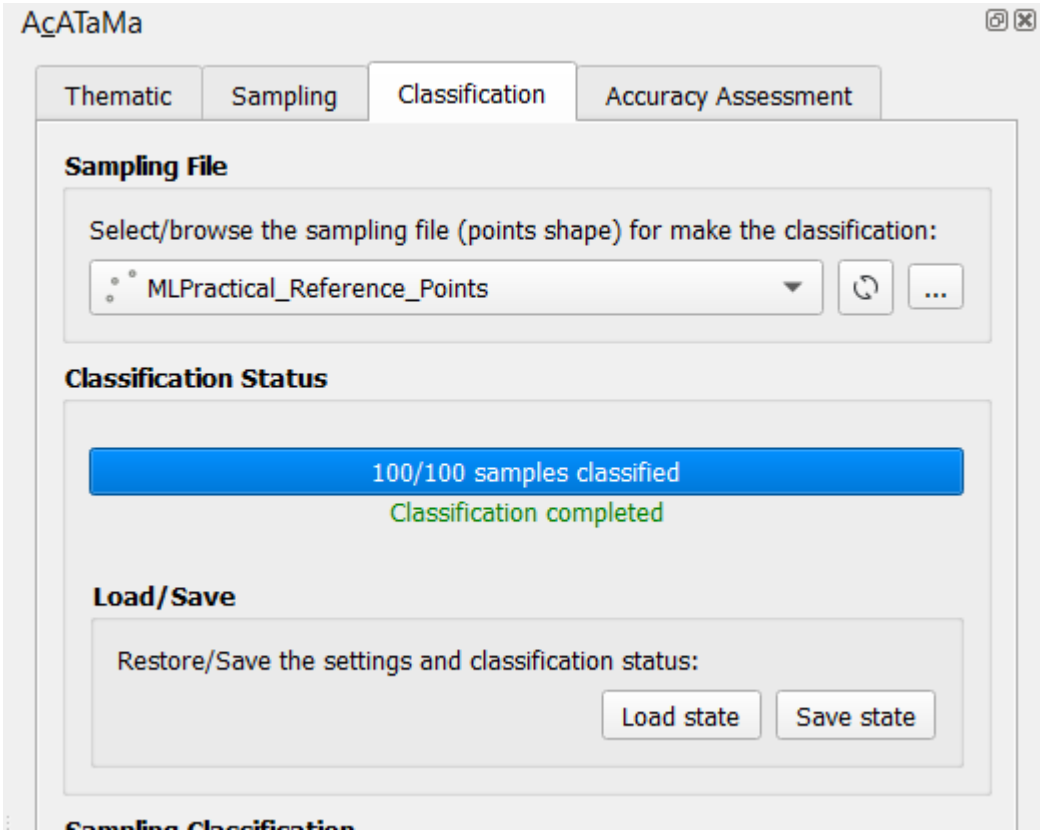
To test the classification results, 100 points were randomly selected and labeled according to the CCI land cover layer.

Instructions

1. Load your QGIS project from Part 1 (or start a new project and load all of the layers listed under "Data to be Used" above.
2. The AcATaMa plug-in has a native .yml file. You will need to change the file to fit your filenames. Open **MLPractical_Reference_Points.yml** in Notepad. Change the filenames highlighted in the image below to match the names and paths to the classification raster ("thematic_raster") and the reference points ("sampling_layer").



3. Open the AcATaMa plug-in (at the top 'Plugins → Accuracy Assessment of Thematic Maps → AcATaMa'). Select your classification result under the "Thematic" tab. Go to "Classification" tab and select **MLPractical_Reference_Points** as the Sampling File and click on "Load State" and open **MLPractical_Reference_Points.yml**.



4. Finally – look at the confusion matrix. Go to "Accuracy Assessment → Open the accuracy assessment results". Answer the questions below.

> ***ADVANCED:*** *The dzetsaka plug-in also lets you do different types of classifications. Try a different classification and compare the results by performing an accuracy assessment with AcATaMa.*

> ***ADVANCED:*** *Try making your own reference data. Use the "Sampling" tab and the "Classification" tab to randomly generate samples and assign them the correct label.*

Analysis questions

- What is the overall accuracy of your result?
- Which class has the highest producer's accuracy? And which has the highest user accuracy?
- Which classes are well classified and which are more confused?
- Compare the reference CCI Land cover map to what you see in the Sentinel-2 image. Do you think it is good?
- How do you think you can improve the classification? → try it!