

# Mapping Regions of Excess Carbon Dioxide in Hawaii Using AVIRIS

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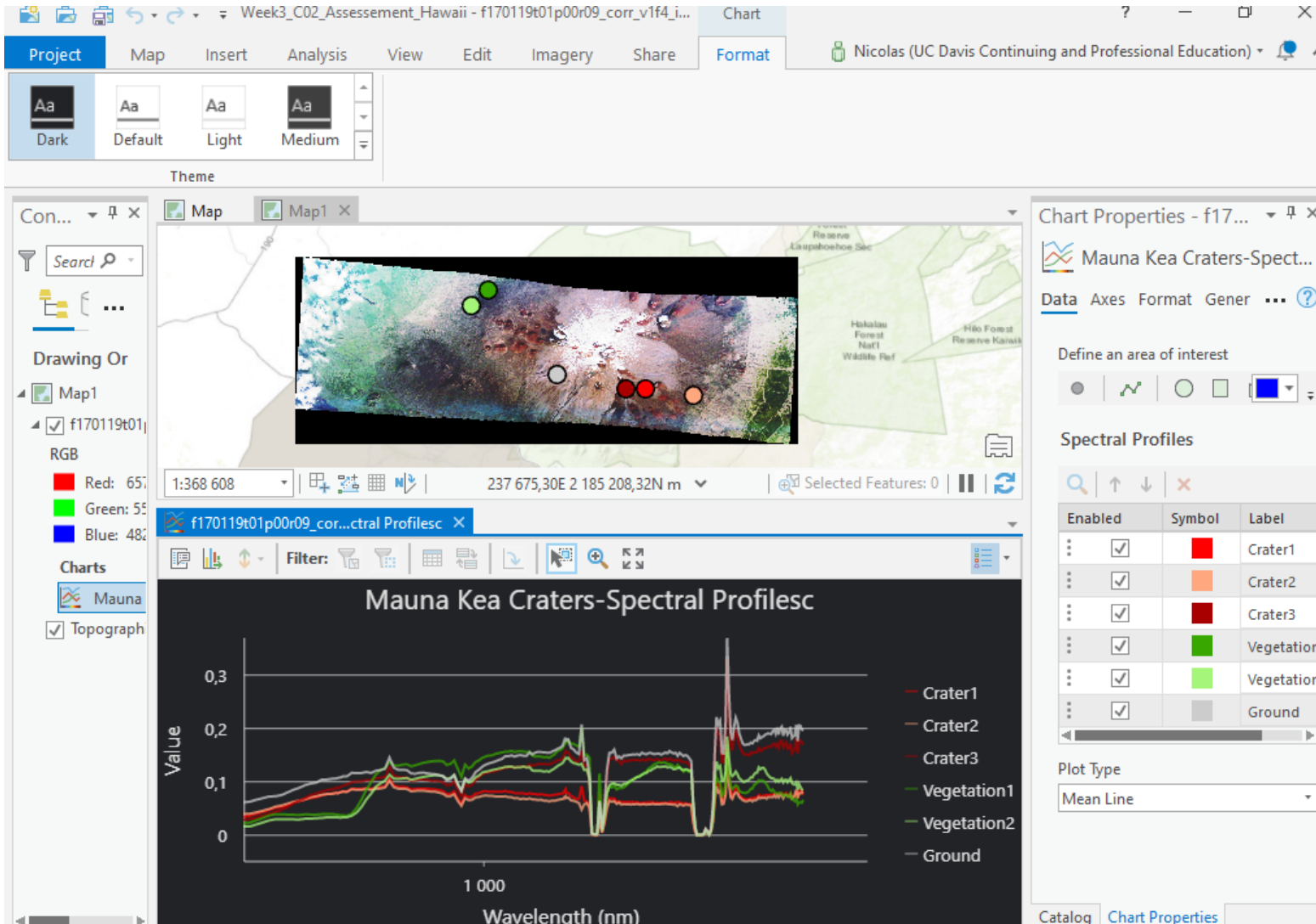
Reference:

<https://aviris.jpl.nasa.gov/dataportal/>

# Outlining Process

- 1) Pre-processing the AVIRIS data for Mauna Kea, a volcano on the island of Hawaii
- 2) Create Classification Schema
- 3) Collect and Document Training Data
- 4) Plot of the spectral profiles of training
- 5) Classify Imagery using Support Vector Machine (SVM)

# 1) Pre-processing and displaying the AVIRIS data for Mauna Kea, a volcano on the island of Hawaii



## Raster information

### Spatial resolution

- Cell size X: 36.04 m
- Cell size Y: 4.98 m

### Spectral resolution

- 224 bands (Hyperspectral data)

### Pixel depth

- 32 bit

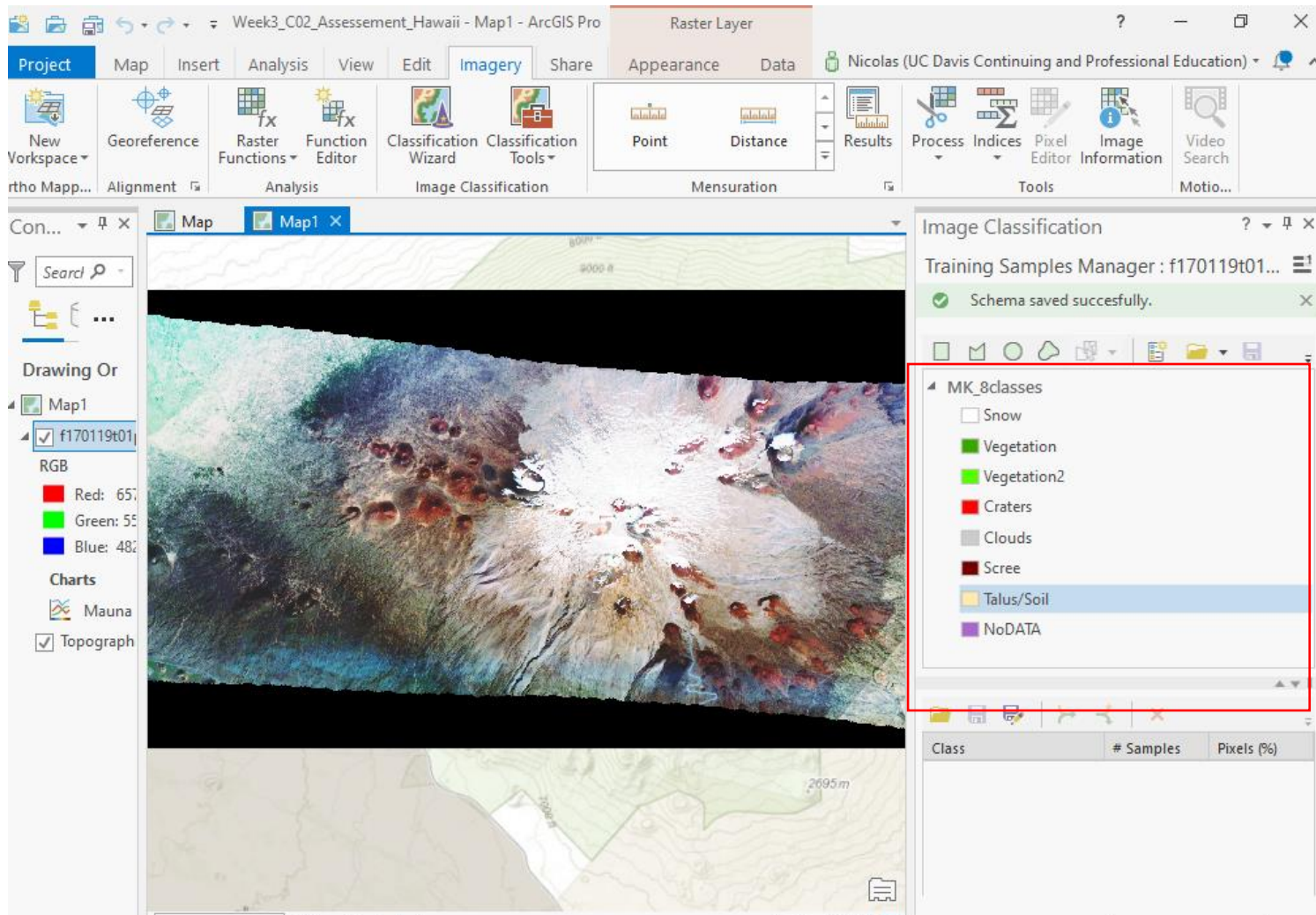
### Date

- 19.01.2017

### Location

- Mauna Loa/Kilauea Crater

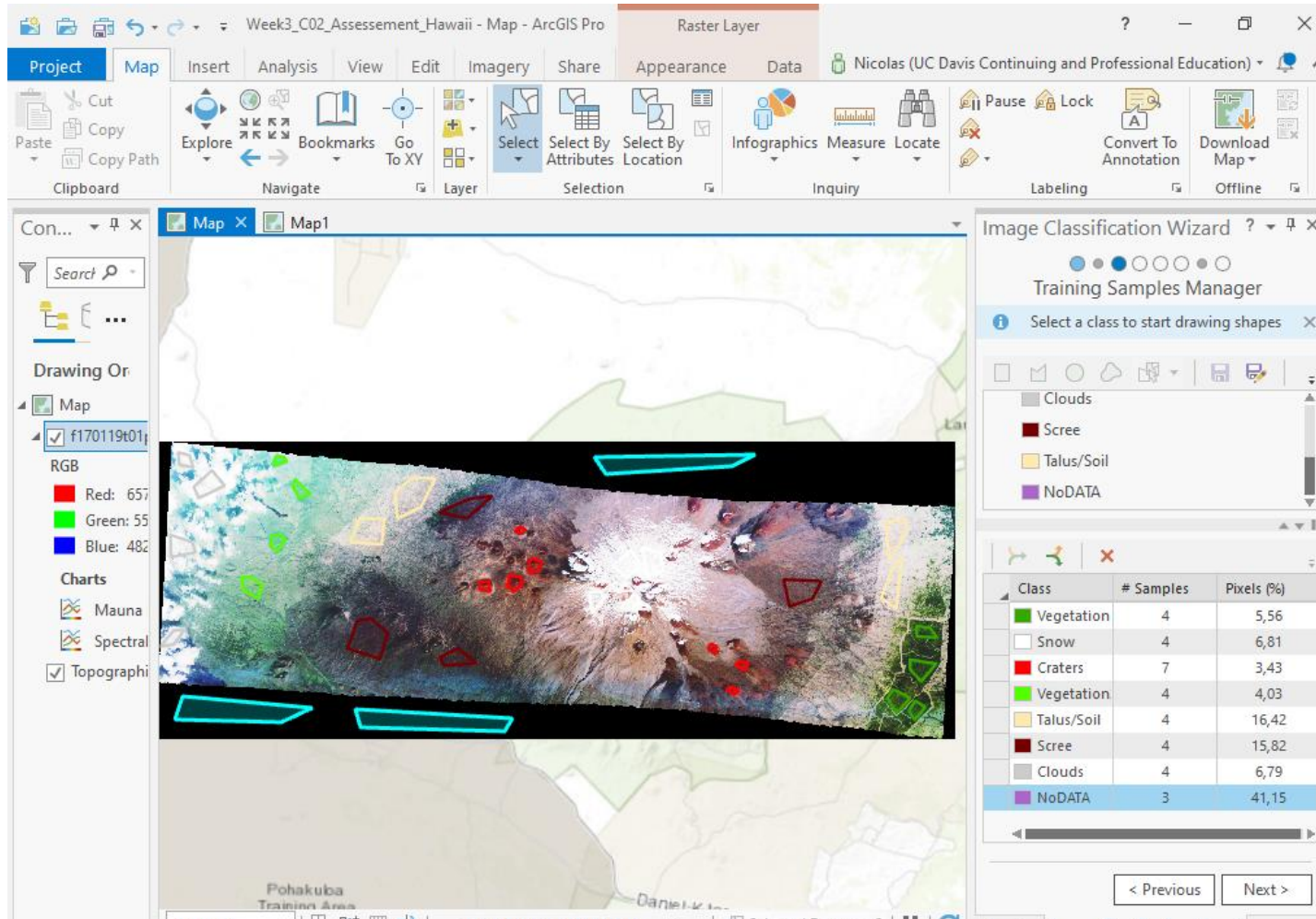
## 2 ) Create Classification Schema



### Classification schema information

- 8 classes have been chosen to cluster this raster in order to separate components according to different structural and chemical properties
- This schema will be used as input in classification wizard
- Vegetation 1 and 2 classes are used to differentiate woody and herbaceous vegetation

### 3) Collect and Document Training Data

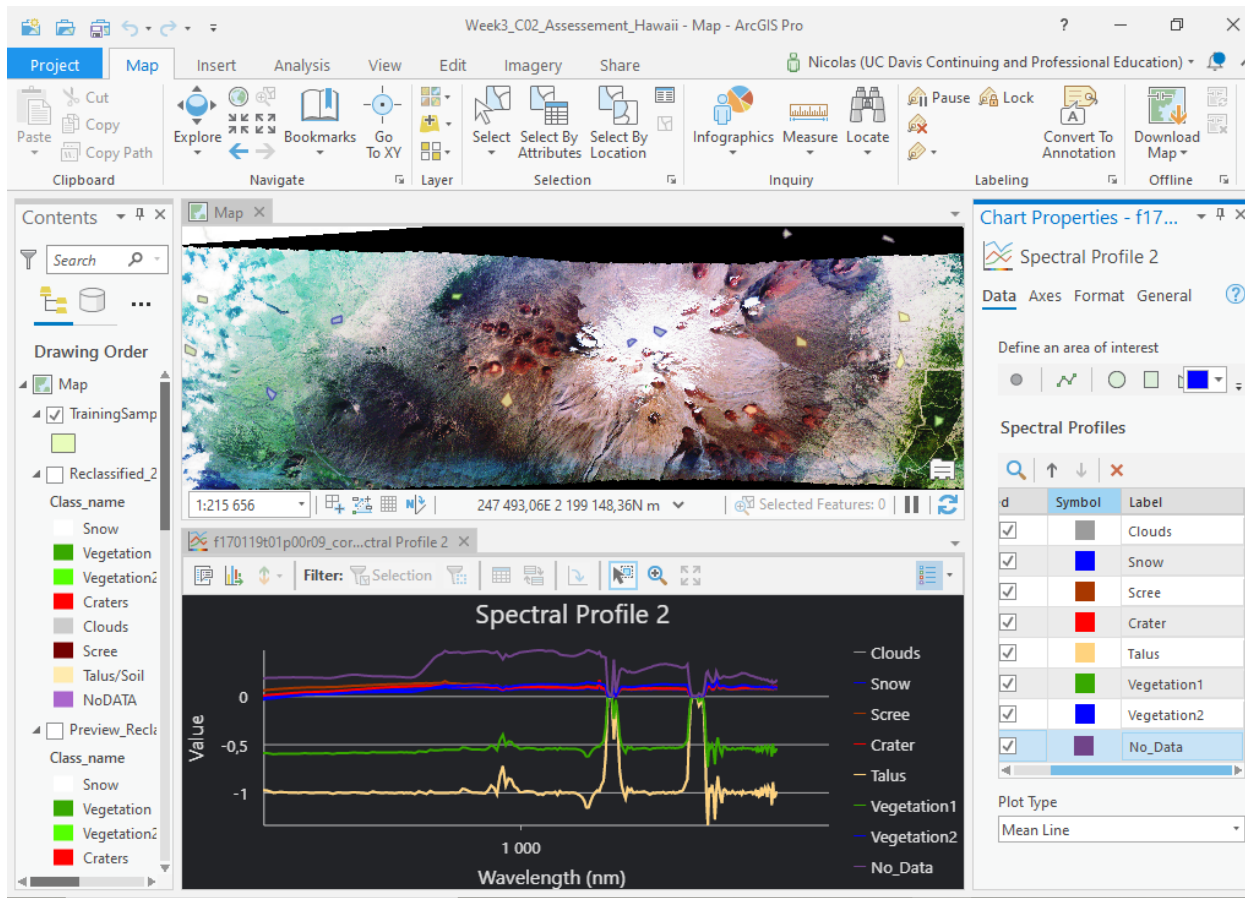


#### Training data information

- The 8 classes have been attached with specific polygons belonging to their class
- The color of the polygons are defined by their color class



# 4) Plot of the spectral profiles of training samples

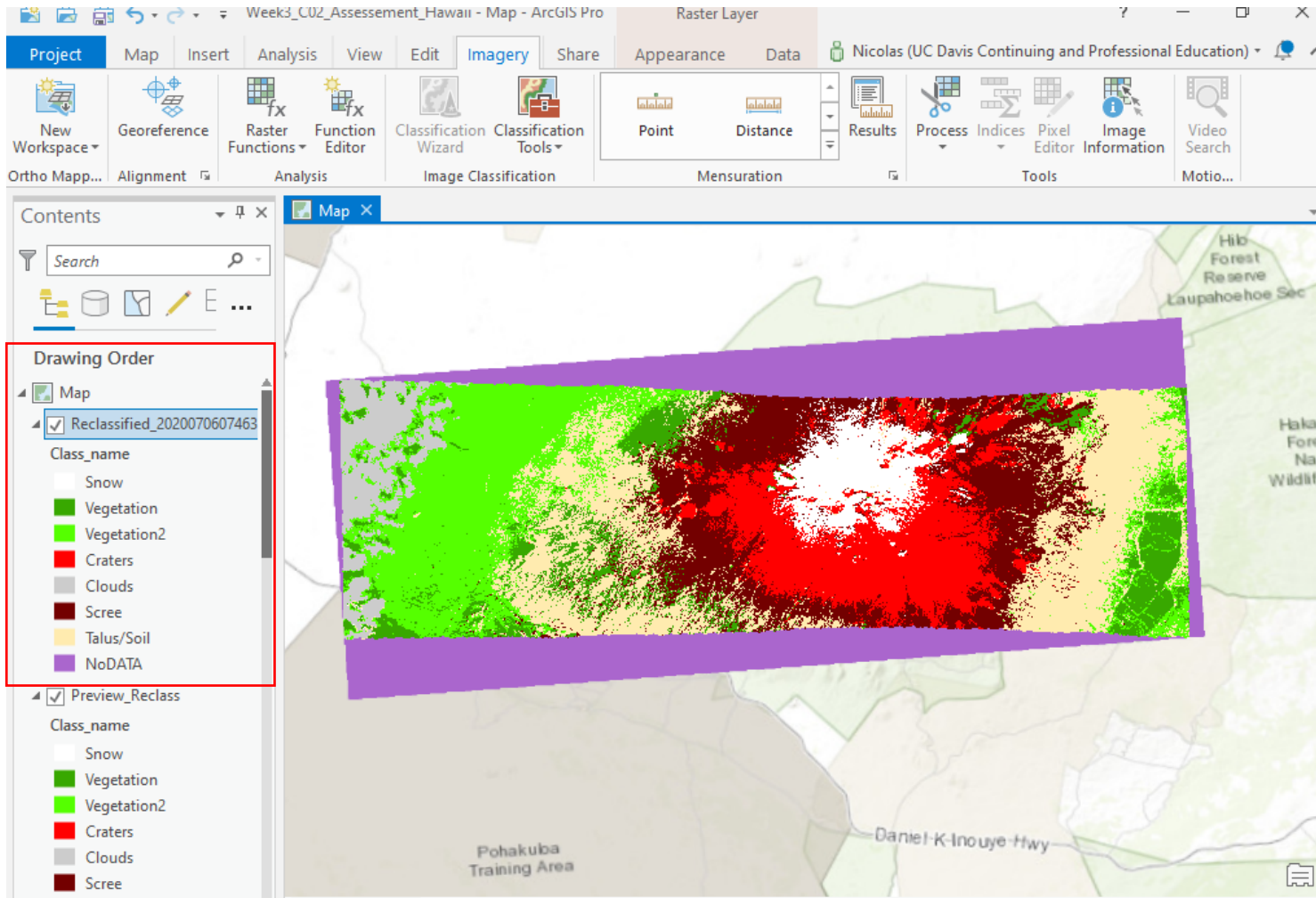


## Spectral profile information information

- If we focus on similar spectral profile like snow, scree, crater and spreaded vegetation (vegetation2), the differences are more visible between these profiles
- However I don't know why dense vegetation (vegetation1) and talus appear with negative value and seem completely different from the other mentioned above
- For clouds and no data, that's not surprising to see that they have unique spectral profile



# 5) Classify Imagery using Support Vector Machine (SVM)



## Final result of the AVIRIS imagery in 8 different classes (SVM classification)

- The legend of the raster is available on the left
- It was interesting to see that the craters spectral profile has been generalized to the structure of the volcano and not in specific location where we can see the craters
- Even with the strange spectral profile of dense vegetation (bright green) and talus (light brown), the classification seem good according to the visible reality