

## Lab 9: VEGETATION INDICES AND SUPERVISED CLASSIFICATION

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### 1. Vegetation Indices

There are many methods for classifying satellite imagery, and each classification method has its own pros and cons. Today's Lab will guide how to use ENVI/ArcGIS to classify land cover based on the NDVI vegetation index. Two layers of images are provided from the Sentinel satellite image with a resolution of 10m. The formula for NDVI calculation:

$$NDVI = \frac{NIR - RED}{NIR + RED}$$

Sample thresholds for each class of land cover:

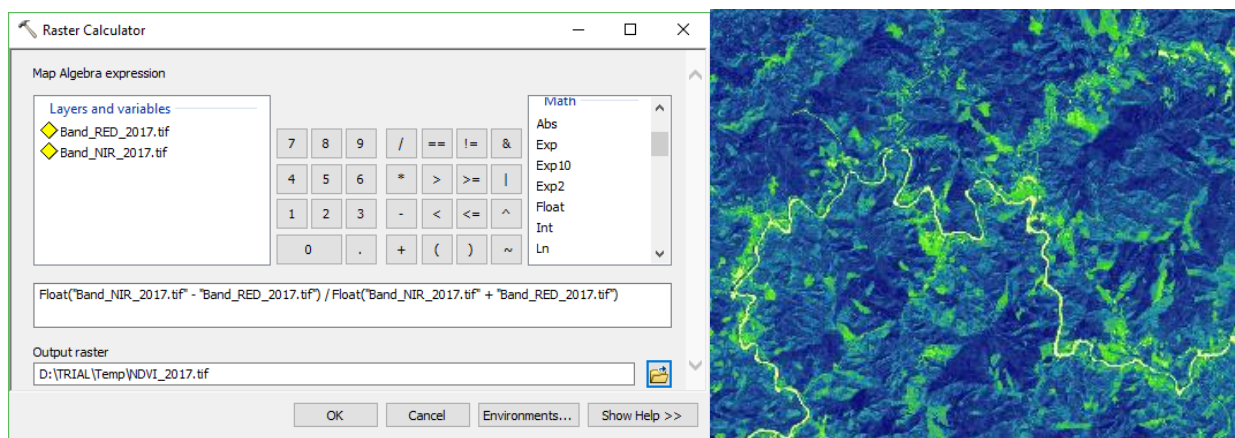
Classes	NDVI value
Water	< 0.261
Residential	0.261 - 0.475
Bareland	0.475 - 0.535
Forest	> 0.535

### Using ArcGIS

Add bands **NIR** and **RED**

**ArcToolBox -> Spatial Analyst Tools -> Map Algebra -> Raster Calculator.**

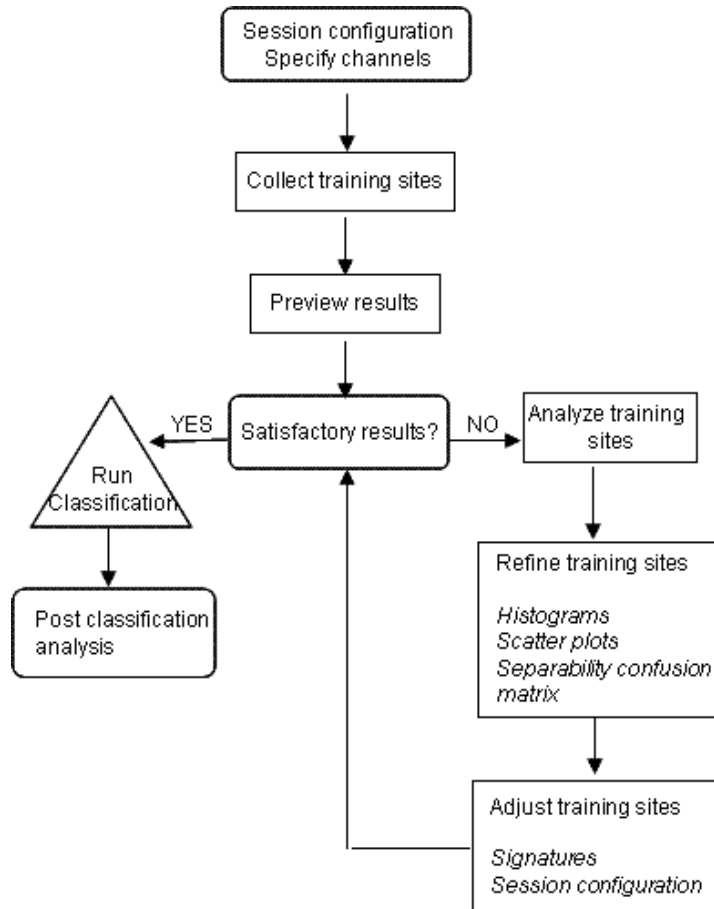
Using Expression as the following capture:



Applying **Classify Tool** for classification

## 2. Supervised Classification

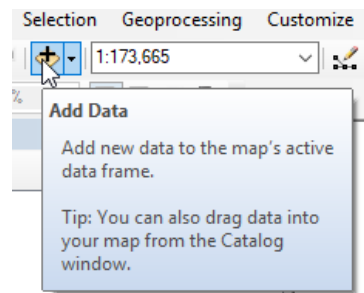
Supervised classification requires that the user select training areas for use as the basis for classification. Various comparison methods are then used to determine if a specific pixel qualifies as a class member.

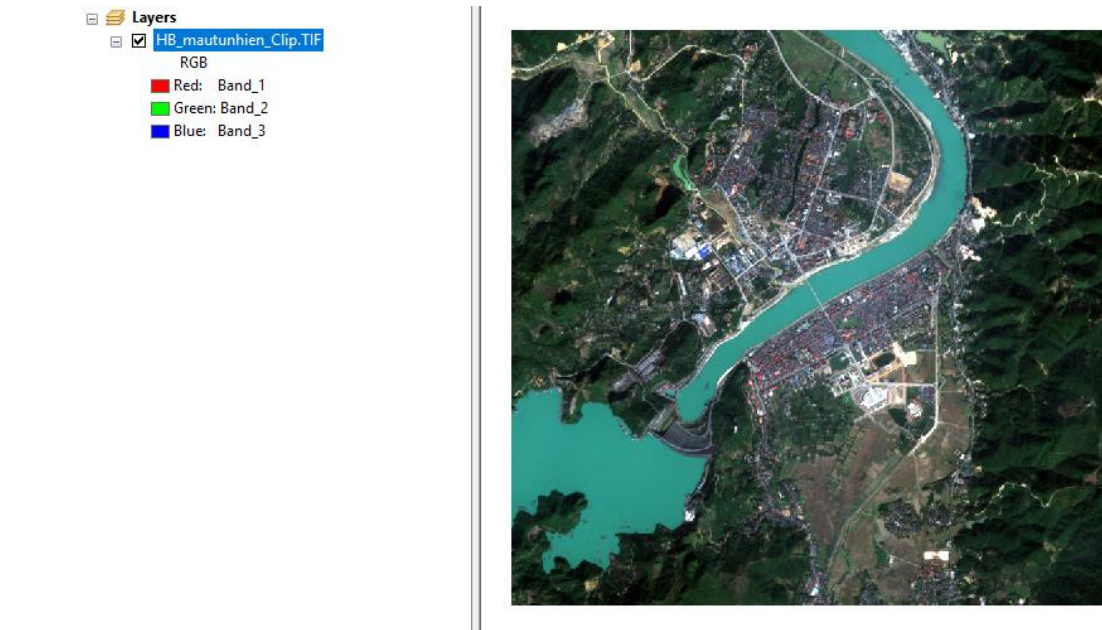


**Supervised Classification Process**

## Supervised Classification in ArcGIS

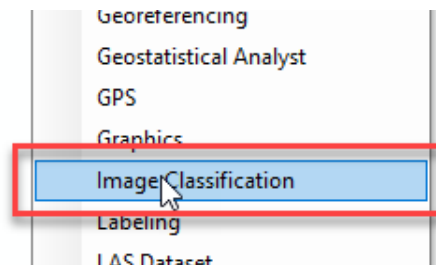
### Add Image



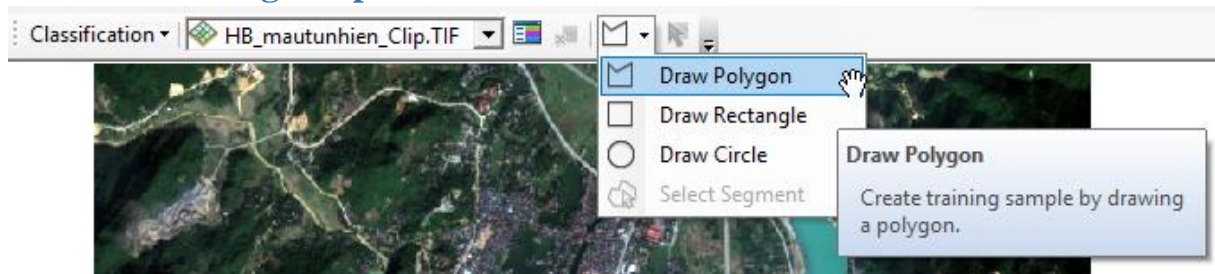


### Activate Image Classification Toolbar

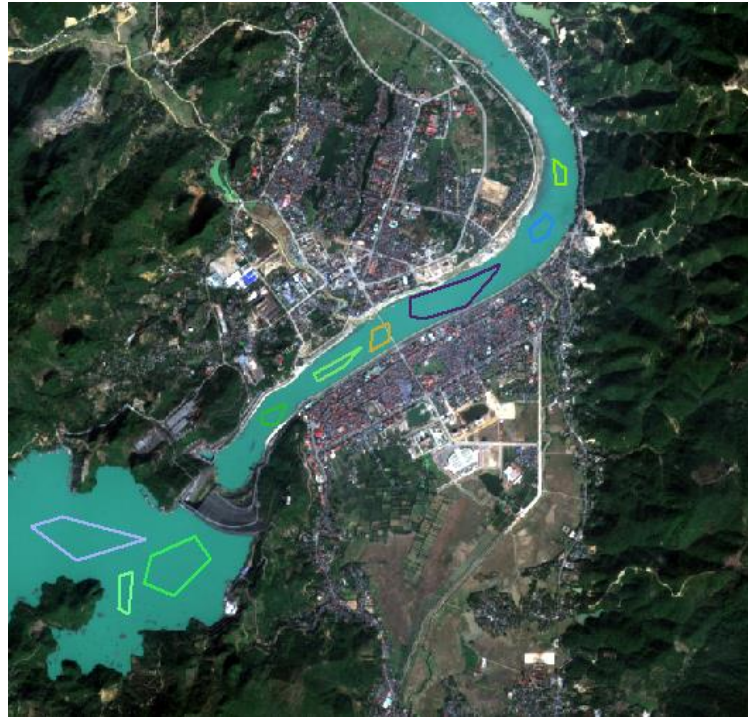
- Right Click in Toolbar => Image Classification.



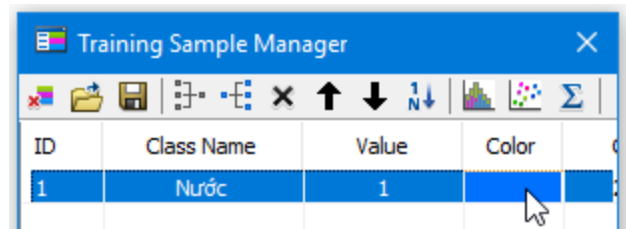
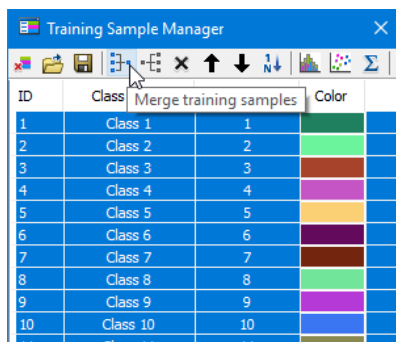
### Create training samples file



- Vẽ các polygon cùn trạng thái (ví dụ Nước)

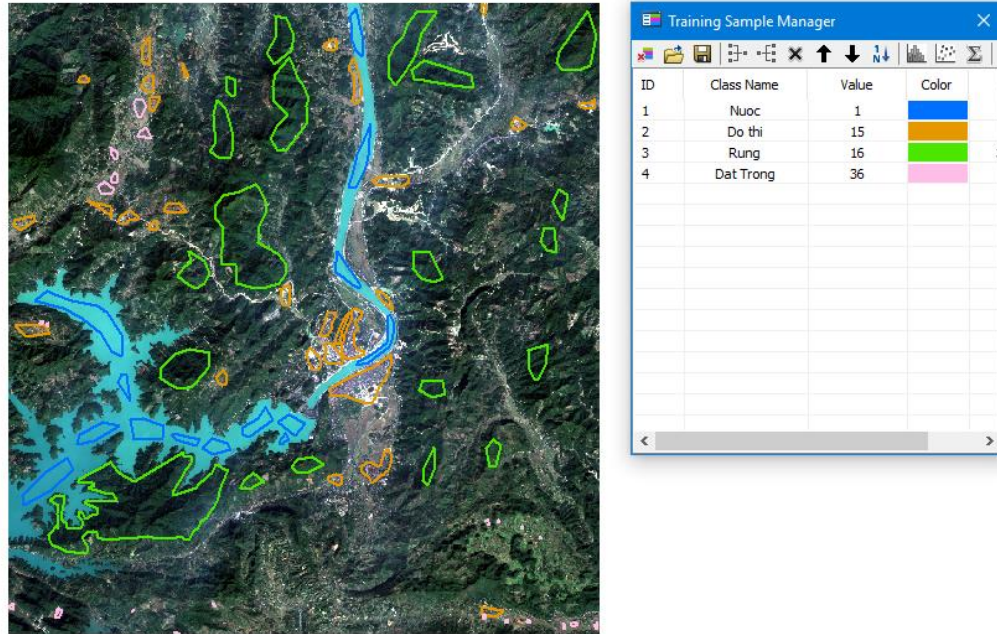


- **Merge Training Samples** → Change Class Name and Color

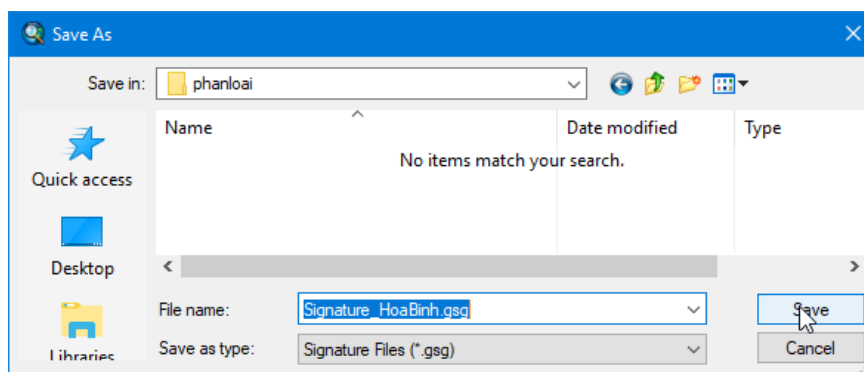
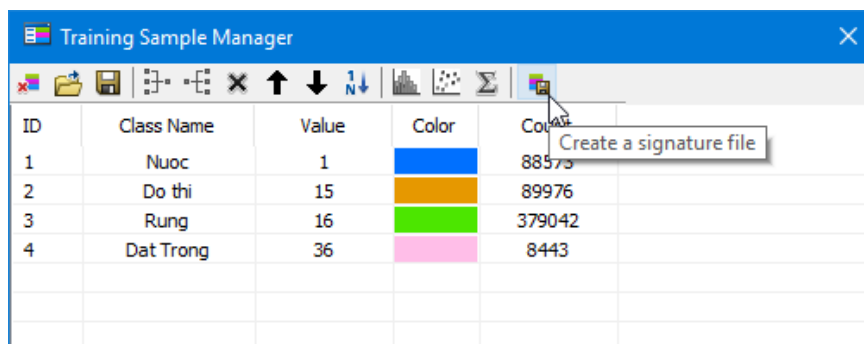


- Create sample for other classes

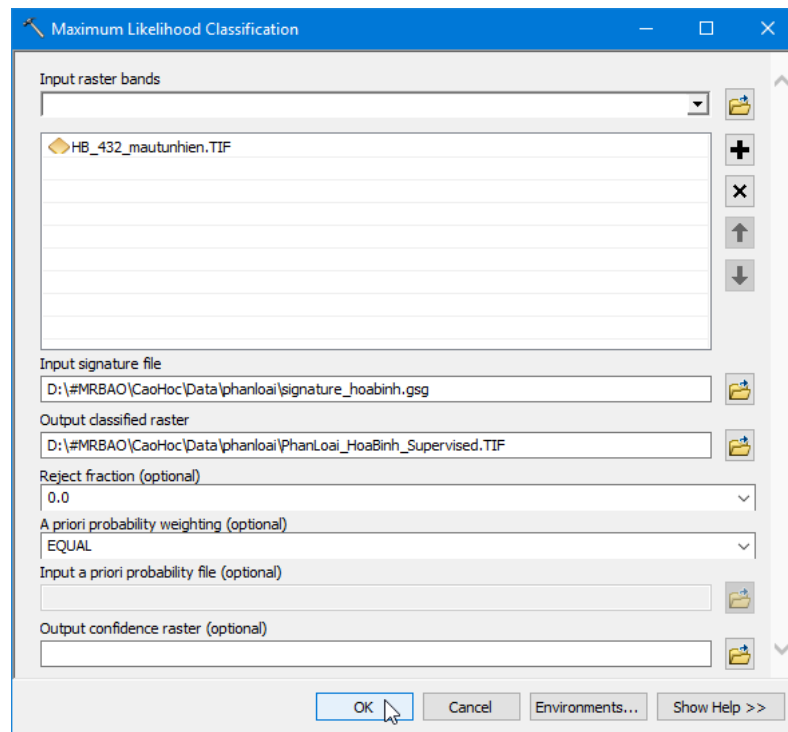
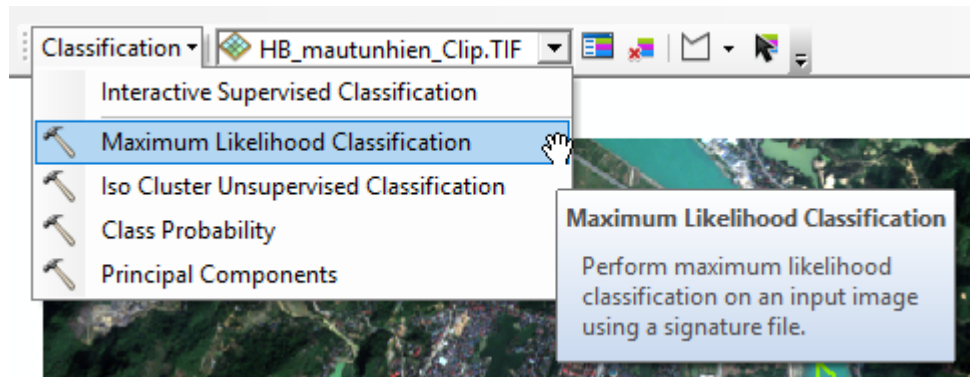




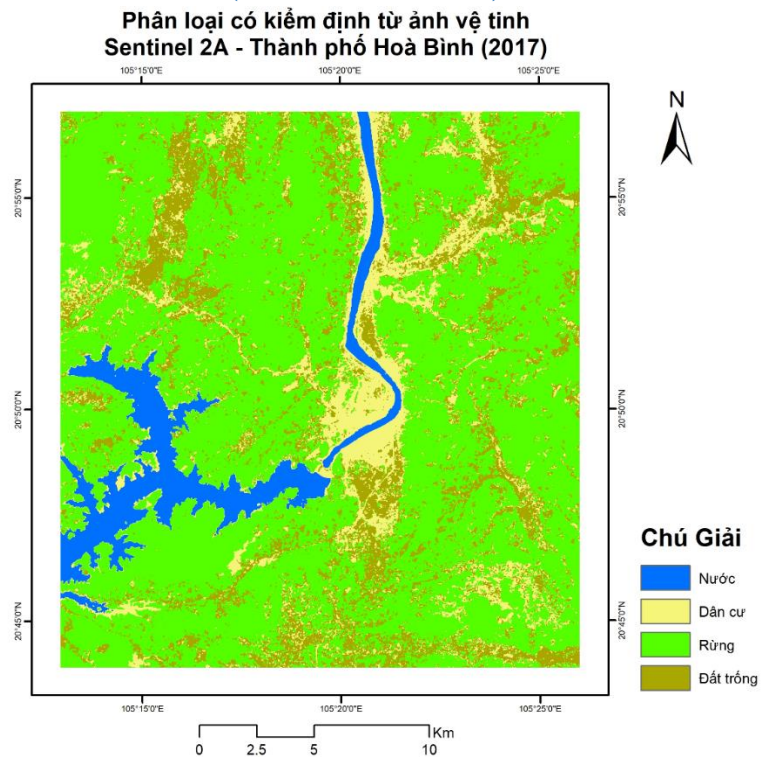
- Save (Signature):



## Run Maximum Likelihood Classification



**\* Run Post Classification (similar to Lab 8)**



**TURN IN:**

- The final layout of the classification map by ArcGIS
- Workflows with description (or paragraphs explaining processes of classification).

**Due date:** 1 week after having instruction.