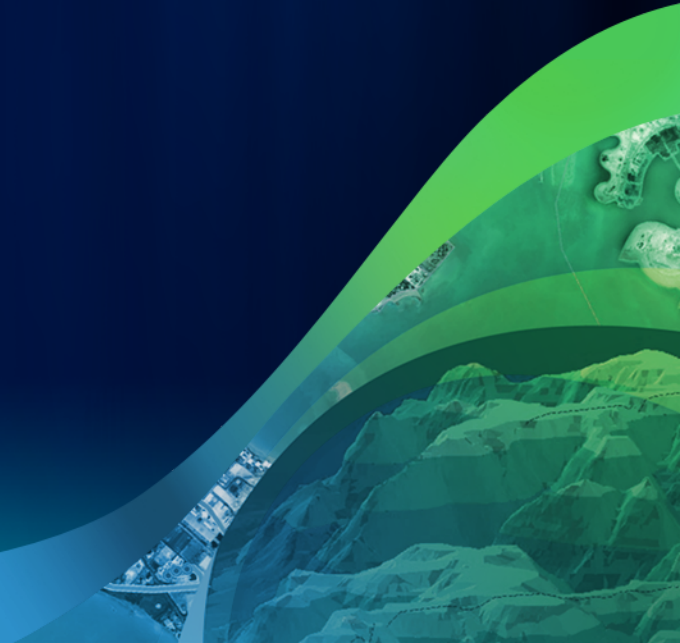




Esri International User Conference | San Diego, CA
Technical Workshops |

Performing Image Classification



Outline

- **Supervised classification**
- **Demonstration**
- **Unsupervised classification**
- **Demonstration**

Problem 1: Supervised classification

- **We want to create a map of land-use types**
- **We have a multi-band raster**
- **We can identify several of the different land-use types on the image from knowledge of the area**
- **It would be very time consuming to manually classify each cell into a land-use type**

Problem 1: Supervised classification

- **We know that each land-use type generally has a unique spectral signature**
- **From the locations we have identified the land-use types we wish to classify the areas not yet identified into the classes (as closely as possible)**

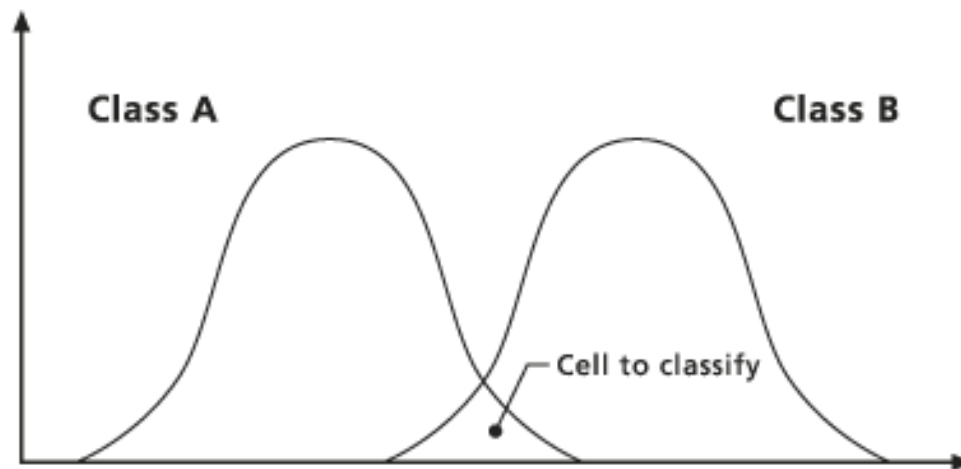
The supervised classification process

- **Identify the locations of the land-use types (classes) by drawing polygons around them – create training sets**
 - **Define the classes**
 - **Make sure you get full representation of the class**
- **Calculate the statistics of the cells for each class to define the characteristics of the class – calculate signatures**

The supervised classification process

- **Determine if the classes are unique enough or if you need additional classes – evaluate signatures**
 - If the statistics for two classes are very similar it will be difficult to differentiate between the classes
 - If you do not have enough classes to represent all the different classes in the study area, certain locations will be assigned to the class that it is statistically closest to
- **Using the statistics from the signature file, classify the entire satellite image**
- **Validate the results**

Performing the classification



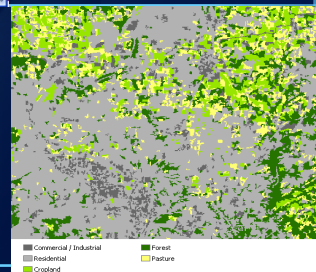
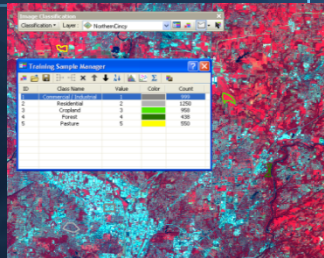
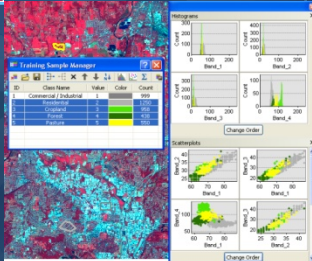
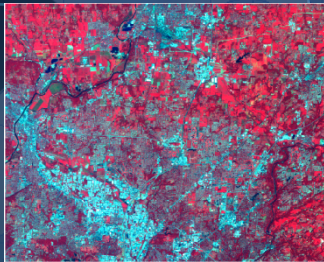
Classification tools

- **Individual tools in the Multivariate Toolbox**
- **Classification toolbar**
 - **Creates training samples**
 - **Calculates signature files**
 - **Edits the signature files**
 - **Classifies the data**
 - **Supervised**
 - **Unsupervised**

Demo 1: Classification

Classification toolbar

Supervised classification



Problem 2: Unsupervised classification

- **We wish to map an area into 10 levels of forest productivity for timber extraction**
- **We know that forest productivity can be determined by certain criteria (e.g., slope and aspect)**
- **We do not know which areas should belong to each class but we do know that similar levels of productivity have similar characteristics relative to the input criteria**

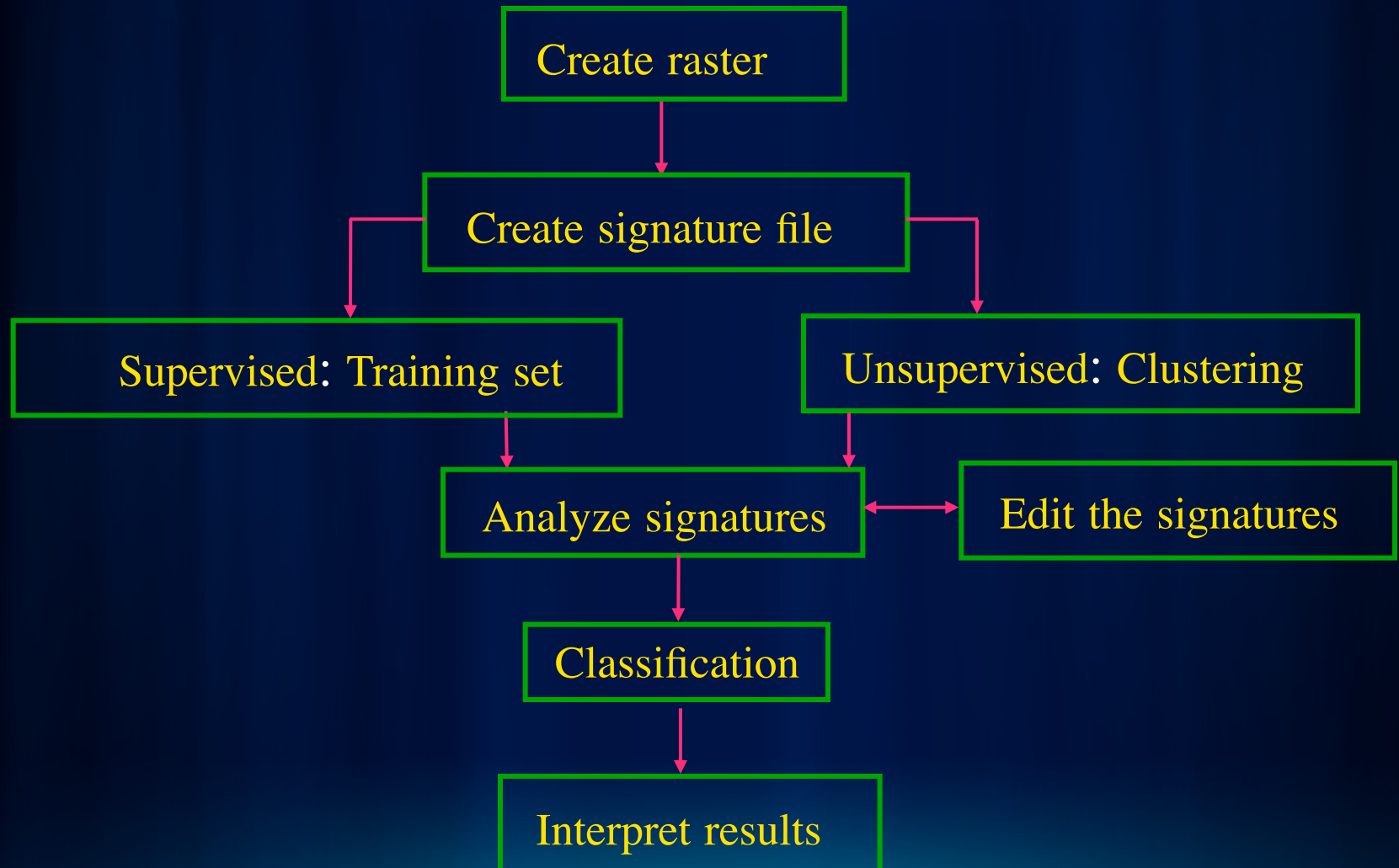
The unsupervised classification

- **Determine which data layers (the criteria) that are to be used to determine forest productivity**
- **Define the number of clusters to group the area into**
- **Create and evaluate the clusters**
- **Classify the entire study area into the clusters**
- **Interpret the results**

Difference in creating classes and clusters

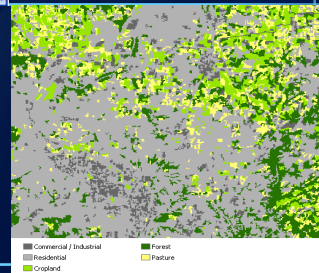
- **Supervised – define the classes by training samples**
- **Unsupervised – identify the number of clusters**

Multivariate Analysis review



Unsupervised classification

Performing the classification



Open to Questions

...Thank You!