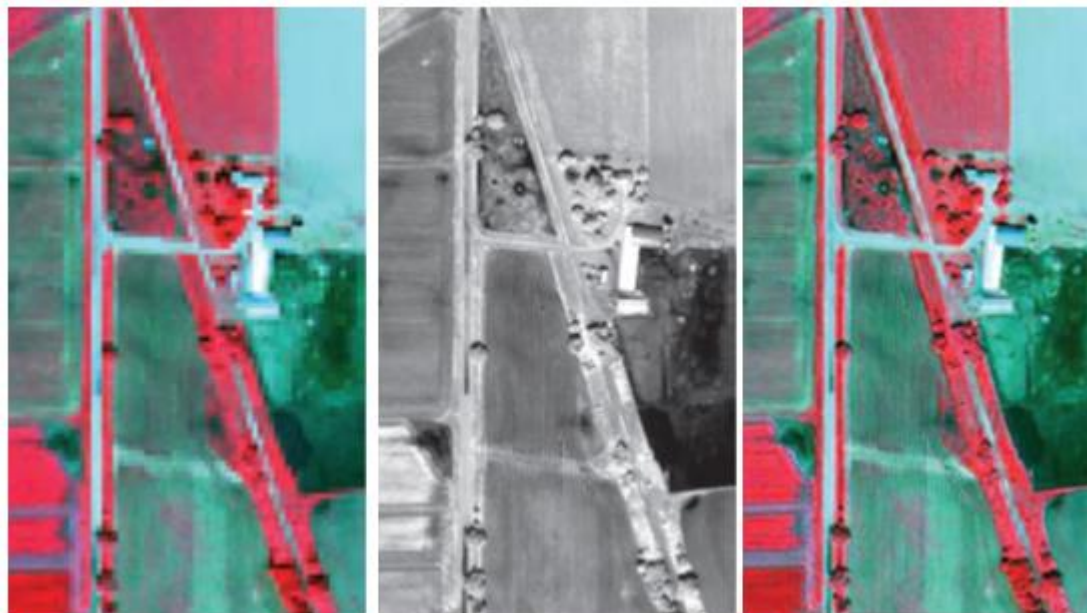


# *Chapter 6: "Continuing with Digital Image Processing"*

## **Data Merging:**



*Many applications of digital image processing can be enhanced through the merging of multiple data sets, that can be of variety of forms, covering the same geographic area.*

# *Chapter 6: “Continuing with Digital Image Processing”*

## **Data Merging:** (continue)

### *Examples of different types merging;*

- *1. Multi-temporal data merging:*

*In such operation, we simply combined images of the same area taken on more than one data.*

- *2. Multi-sensor data merging:*

*These operations have been extensively used to combine multi-images from different images with different resolution to come up with new enhanced image that has the best of the images that was used to produce it.*

# *Chapter 6: "Continuing with Digital Image Processing"*

## **Data Merging:** (continue)

### *Examples of different types merging;* (continue)

- 3. *Merging of images with ancillary data:*

*Ancillary data are any non-image data set. They have to be accurately geo-coded so that they can be registered with the image data to a common geographic base.*

- 4. *Incorporation GIS data in land cover classification:*  
*This will allow the analyst to use the GIS information to help classifying an image as well as to check the classification results.*

# Chapter 6: "Continuing with Digital Image Processing"

## Biophysical Modeling:

The goal of biophysical modeling operations is to relate quantitatively the remotely sensed data to biophysical features & phenomena measured on the earth's surface.

Remotely sensed data might be used in applications as varied as crop yield estimation, biomass production, water depth determination, global warming & pollution concentration estimations, etc.



# Chapter 6: “Continuing with Digital Image Processing”

## Change Detection Procedures:



*Change detection involves the use of multi-temporal data to discriminate areas of land cover change between dates of imaging.*

*The types of changes that might be of interest can range from short term phenomena such as snow cover or flood water to long term phenomena such as urban development or desertification.*

# *Chapter 6: "Continuing with Digital Image Processing"*

## **Change Detection Procedures:** (continue)

*Steps that are most likely to be involved in nearly all change detection procedures;*

- *1. Clear definition of the problem:*

*The first step is to define the change detection problem on hand & the type of remotely sensed data appropriate to the task.*

- *2. Acquire multi-date imagery:*

*Ideally, procedures should involve data acquired by similar sensors & be recorded using the same spectral resolutions, viewing geometry, radiometric resolutions & time of the day.*

# *Chapter 6: "Continuing with Digital Image Processing"*

## **Change Detection Procedures:** (continue)

*Anniversary dates are preferred to minimize sun angle & seasonal differences. Registration to within  $\frac{1}{4}$  to  $\frac{1}{2}$  pixels is generally required. Sensors operating in the visible & infrared portion of the spectrum are the most useful data sources for change detection analysis.*

- *3. Preprocess imagery both geometrically & radiometric:  
The aim of these operations is to correct distorted or degraded image data to create a more faithful representation of the original scene.*

# *Chapter 6: "Continuing with Digital Image Processing"*

## **Change Detection Procedures:** (continue)

- 4. Apply change detection algorithm:

*There are many methods of change detection, such as, (1) post-classification comparisons, (2) classification of multi-temporal data sets, (3) temporal image ratioing, (4) temporal image difference, & so on.*

- 5. Categorize change:

*Transition materials, visual interpretation, etc.*

- 6. Report results:

*There are at least three ways of reporting results: printed maps; printed report including figures, tables & statistical information; & GIS.*



*Chapter 5: "Image Classification"*

# *Artificial Intelligence in Image Classification*

**That's the end of Chapter 6  
Thank You.**