SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution
Coimbatore – 35

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DEPARTMENT OF AGRICULTURE ENGINEERING

19AGT302 – GIS AND REMOTE SENSING

III – YEAR V SEMESTER

UNIT 3 – DIGITAL IMAGE INTERPRETATION AND PROCESSING

TOPIC 4 – IMAGE CLASSIFICATION

Last Class Review

Image Processing

Elements

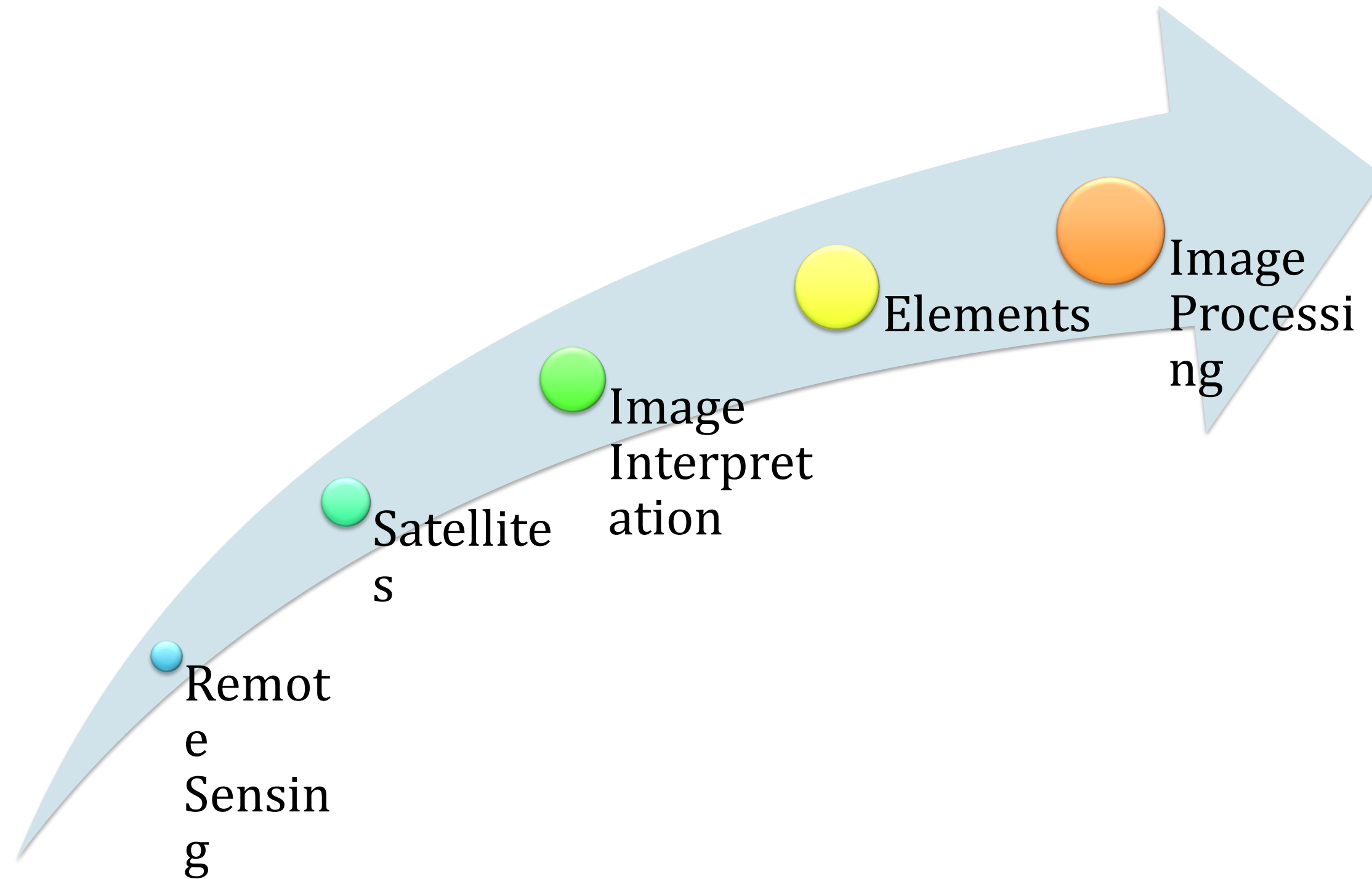Image Interpretation

Satellites

Remote Sensing

Image Classification - Types

Supervised

Unsupervised

supervised classification

❖ In supervised classification, the spectral features of some areas of known landcover types are extracted from the image.
❖ These areas are known as the "training areas".
❖ Every pixel in the whole image is then classified as belonging to one of the classes depending on how close its spectral features are to the spectral features of the training areas.
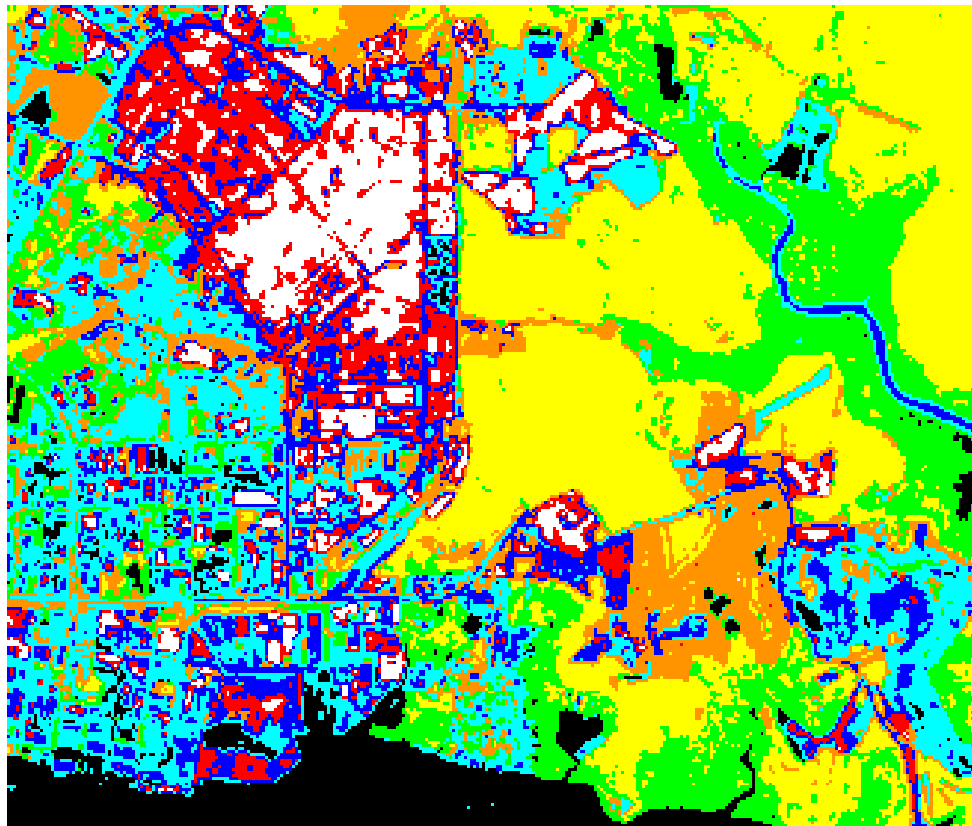
unsupervised classification

- ❖ In unsupervised classification, the computer program automatically groups the pixels in the image into separate clusters, depending on their spectral features.
- ❖ Each cluster will then be assigned a landcover type by the analyst.
- ❖ Each class of landcover is referred to as a "theme"and the product of classification is known as a "thematicmap".

Spatial Feature Extraction

❖ In high spatial resolution imagery, details such as buildings and roads can be seen.

❖ The amount of details depend on the image resolution.

❖ In very high resolution imagery, even road markings, vehicles, individual tree crowns, and aggregates of people can be seen clearly.

❖ Pixel-based methods of image analysis will not work successfully in such imagery.

❖ In order to fully exploit the spatial information contained in the imagery, image processing and analysis algorithms utilising the textural, contextual and geometrical properties are required.

❖ Such algorithms make use of the relationship between neighbouring pixels for information extraction. Incorporation of a-priori information is sometimes required.

❖ A multi-resolutional approach (i.e. analysis at different spatial scales and combining the resoluts) is also a useful strategy when dealing with very high resolution imagery.

❖ In this case, pixel-based method can be used in the lower resolution mode and merged with the contextual and textural method at higher resolutions.

Extraction
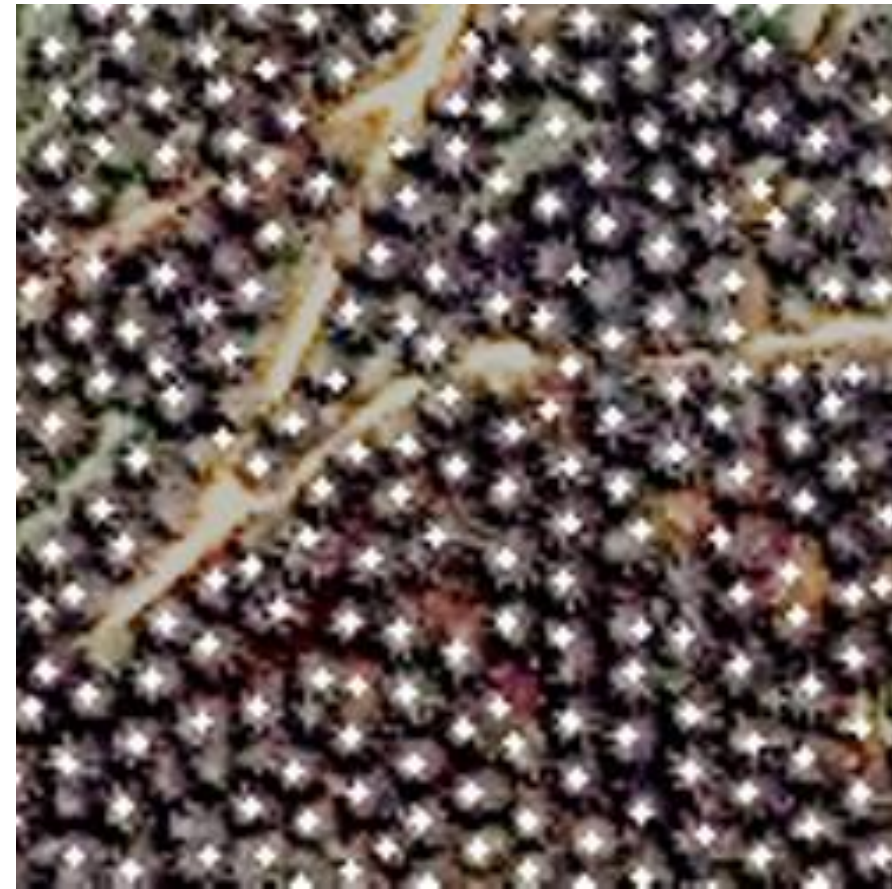
Individual trees in very high resolution imagery can be detected based on the tree crown's intensity profile. An automated technique for detecting and counting oil palm trees in IKONOS images based on differential geometry concepts of edge and curvature has been developed at CRISP.

Extraction

❖ Building height can be derived from a single image using a simple geometric method if shadows of the buildings can be located in the image. For example, the building height of the building shown here can be determined by measuring the distance between a point on the top of the building and the corresponding point of the shadow on the ground, using a simple geometric relation. In this case, the solar illumination direction the satellite sensor viewing direction need to be known.
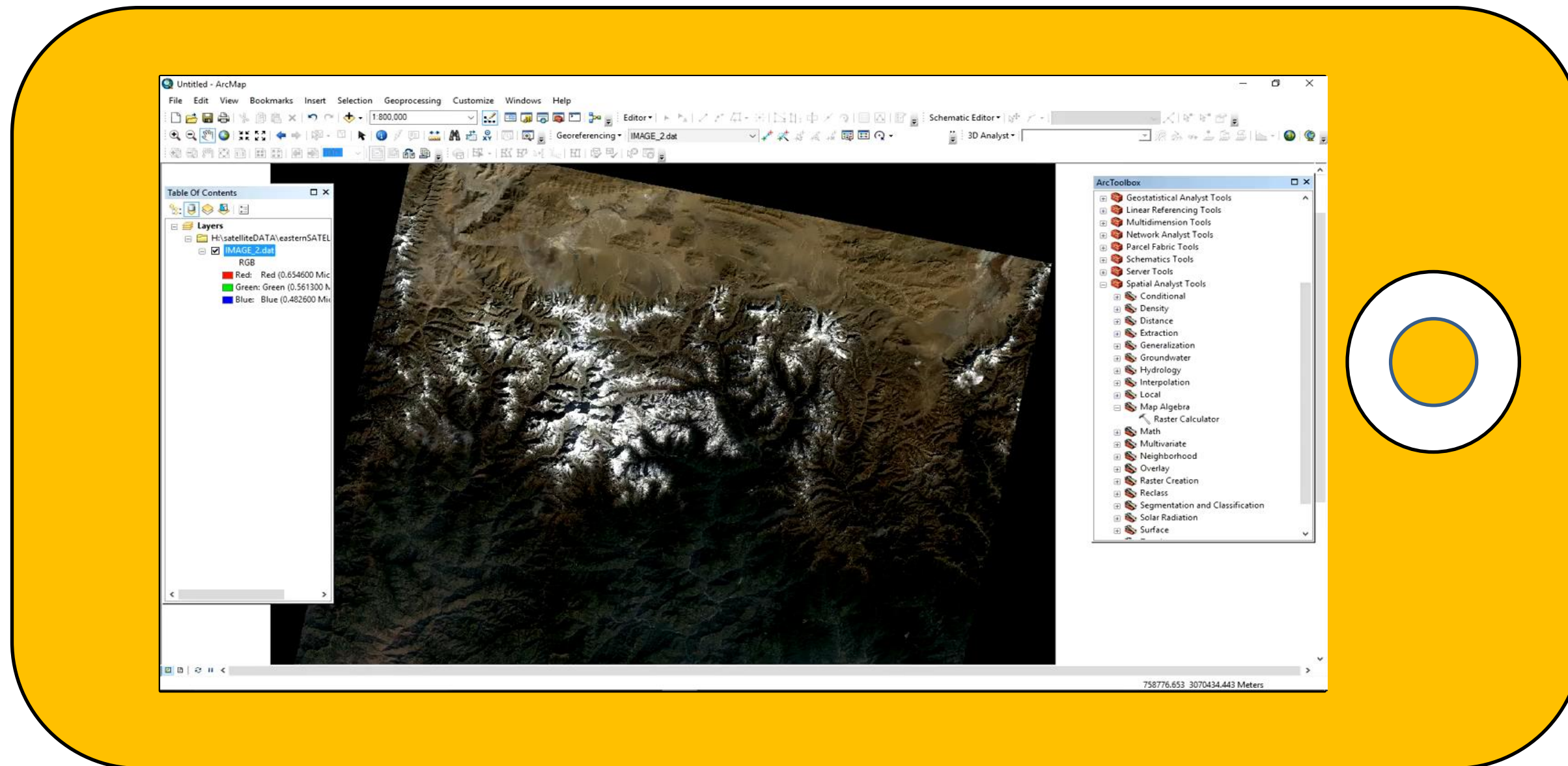
Measurement of Bio-geophysical Parameters

❖ Specific instruments carried on-board the satellites can be used to make measurements of the bio-geophysical parameters of the earth.

❖ Some of the examples are: atmospheric water vapour content, stratospheric ozone, land and sea surface temperature, sea water chlorophyll concentration, forest biomass, sea surface wind field, tropospheric aerosol, etc.

❖ Specific satellite missions have been launched to continuously monitor the global variations of these environmental parameters that may show the causes or the effects of global climate change and the impacts of human activities on the environment.

Reference Videos

See You at Next Class!!!!