Image Interpretation

Image interpretation of remote sensing data is a process of extracting qualitative and quantitative information from the photograph or imagery. It involves identification of various objects on the terrain which may be natural or artificial. It depends on the way how different features reflect or emits the incident electromagnetic radiation and their recording by a camera or sensor.

There are two ways (types) of image interpretation

i) Visual Image Interpretation

ii) Digital Image interpretation

Image Interpretation

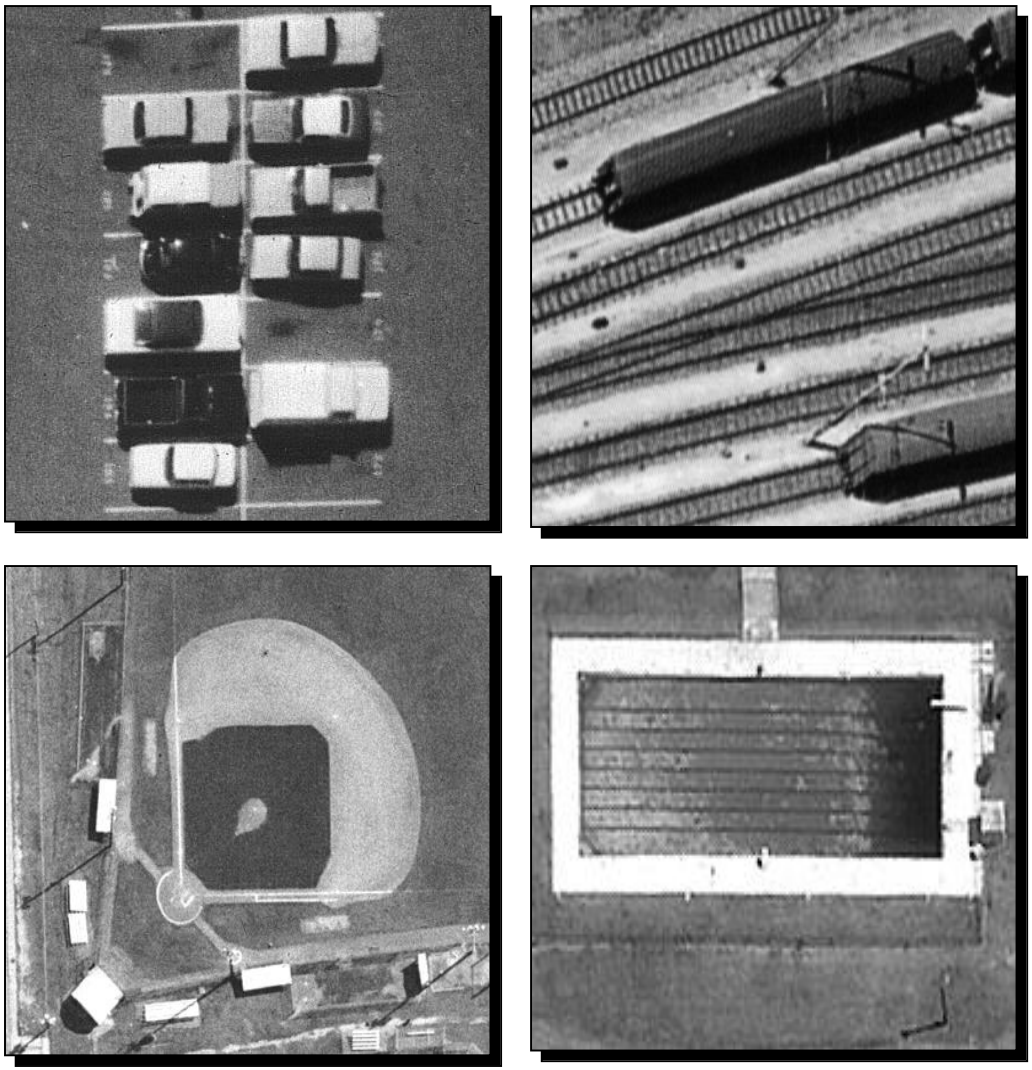
Visual Image Interpretation:
Visual image interpretation is a the process of extracting information using human sight, knowledge and skills. Interpreting an image begins as a visual process consisting of an ordered sequence of steps including: detection, recognition, identification, classification, and analysis.
When viewing an image, one first **detects** the presence or absence of a number of spatial objects in the scene. The brain presumably has some stored experience that enables an interpreter to **recognize** (to generalize spatial entities by sorting them into general feature classes.) objects based upon some measure of learned knowledge; for example, an ability to recognize water from land.
Further thought enables one to **Identify** water as having different physical properties such as variances in color, tone (lightness/darkness), and perhaps patterns such as flow lines indicating movement and direction. The variations in these properties help in classification (categorizing objects or areas by specific criteria through a more formal process of discrimination) of images either by manually drawing boundaries between these visual properties, or by running computer driven classifiers (digital classification). Once the image has been classified, the **Analysis** is done in order to draw scientific information such is nitrogen status, moisture status, pests and diseases status etc.

Interpretation Keys

There are nine different Interpretation keys used for visual image interpretation:
These are

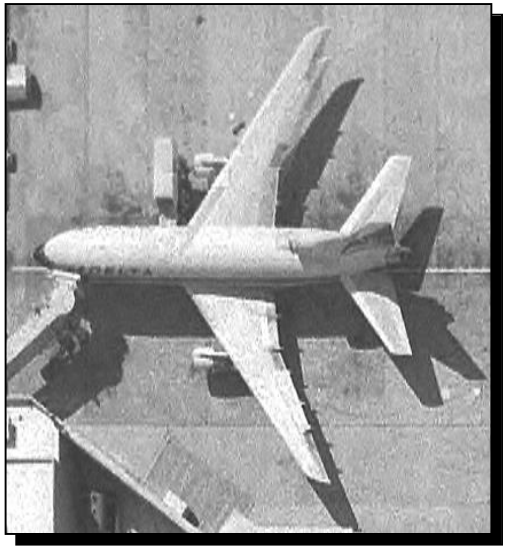
I. Size
II.Shape
III.Shadow
IV.Texture
V.Pattern
VI.Tone and Color
VII.Depth
VIII.Site and
IX.Association

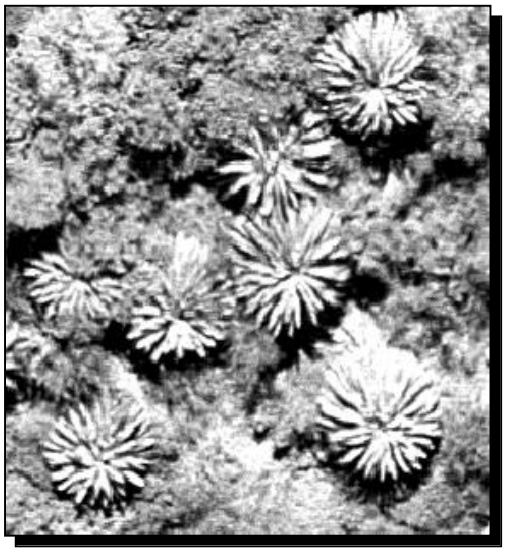
Elements of Image Interpretation - Size

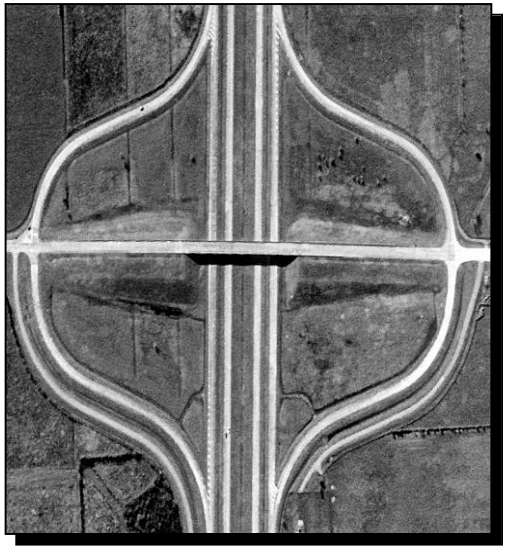


The relative extent of the object or its overall dimensions or magnitude; how big something is. Size of objects in an image is a function of scale hence, the size of objects must be considered in the context of the scale of a photograph/image.

Elements of Image Interpretation - Shape

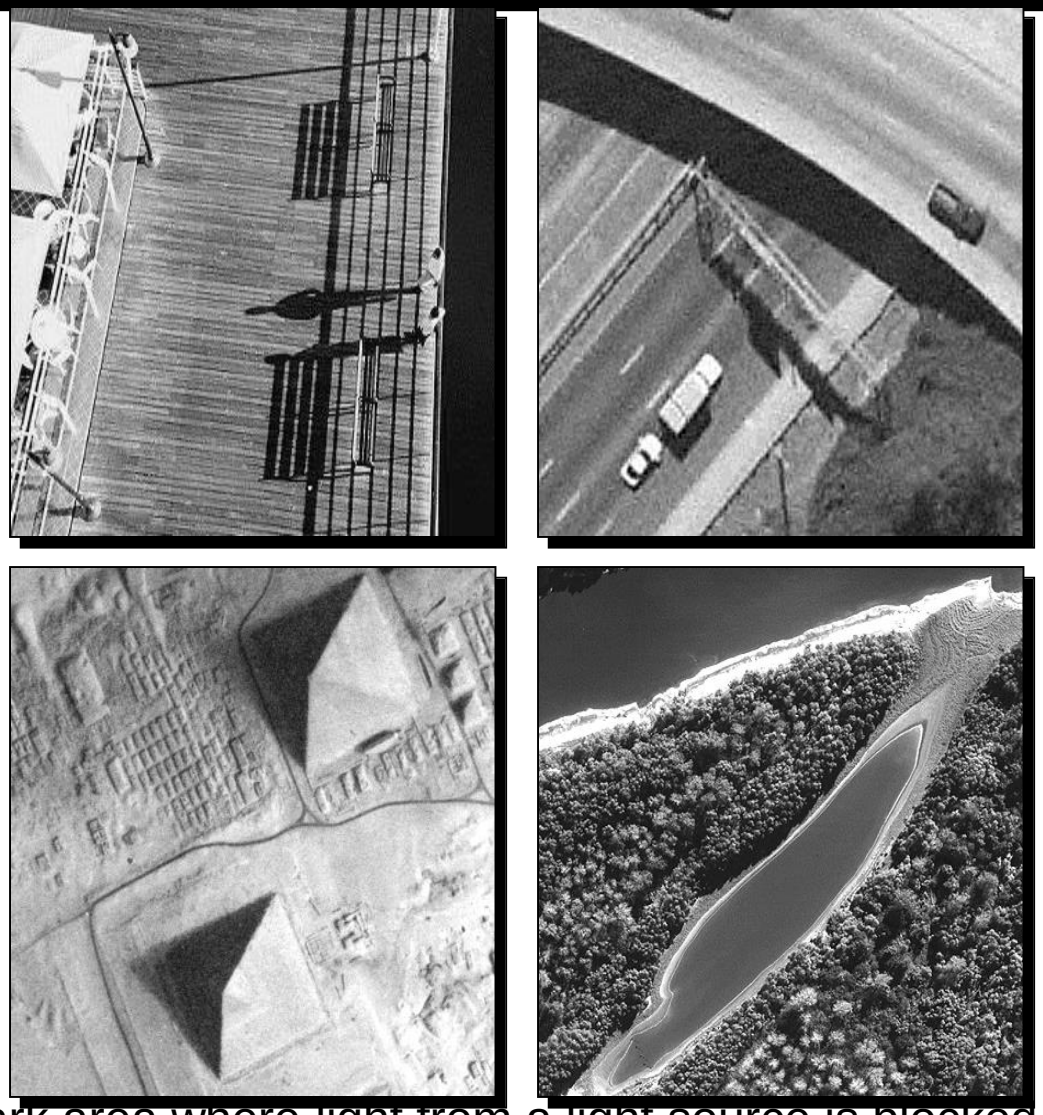






Shape relates to the general form, configuration or outline of an individual object for example airplane, flyover, railway line, countour farm etc

Elements of Image Interpretation - Shadow



A shadow is a dark area where light from a light source is blocked by an opaque object. Shadow is specially very important for the identification of the object in vertical photographs. Shadow gives an impression of shape of the objects.

Elements of Image Interpretation - Tone and Color

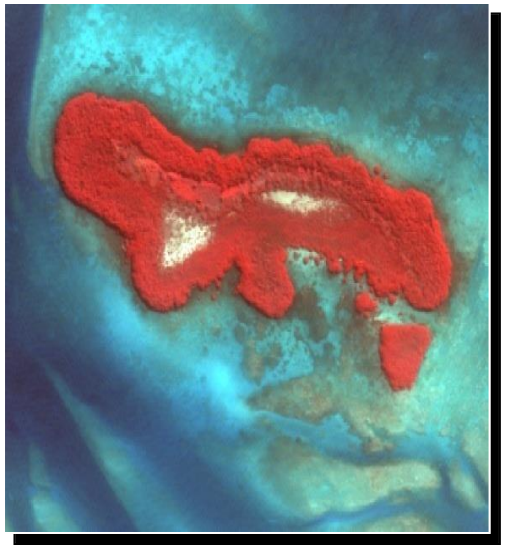
Aerial Photography

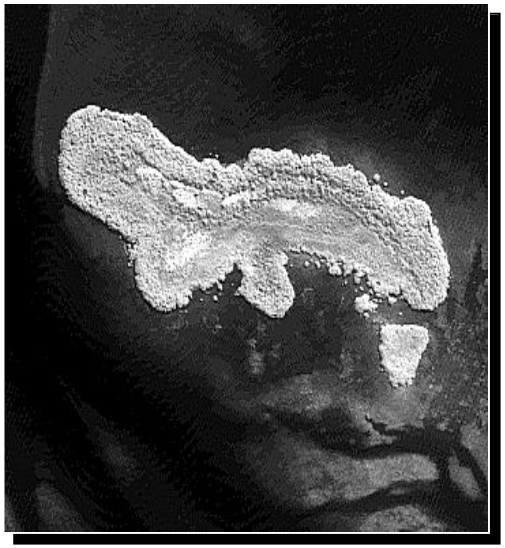
Normal Color

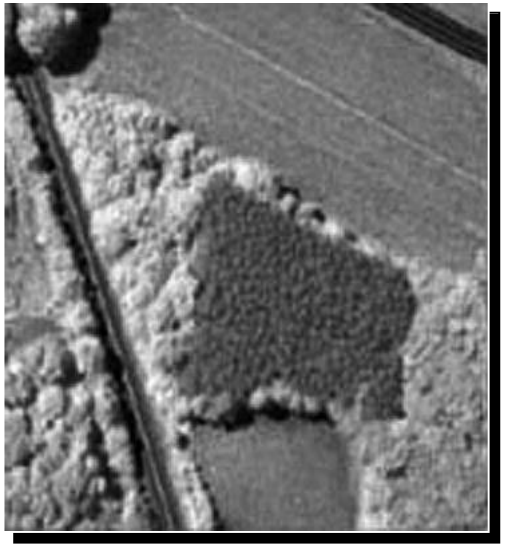
False-color Infrared
Using Wratten #12 filter

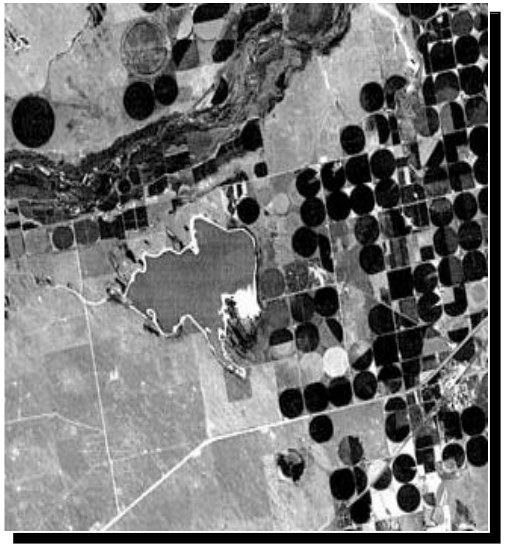
Tone is the relative brightness of grey level on black and white image or color/F.C.C image. Tone is the measure of the intensity of the reflected or emitted radiation of the objects. Lower reflected objects appear relatively dark and higher reflected objects appear bright. Tone and colors are obviously important keys for identification of the objects.

Elements of Image Interpretation - Tone and Color

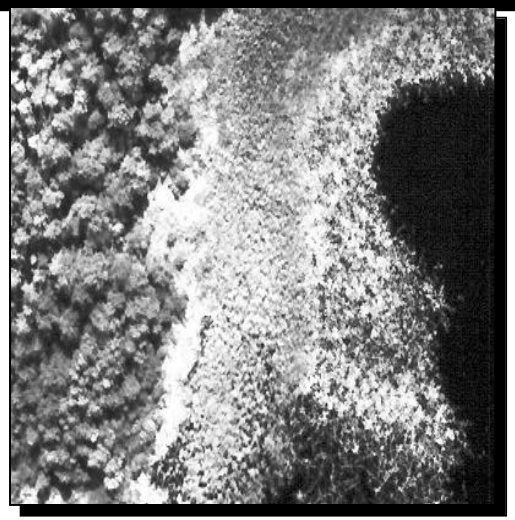


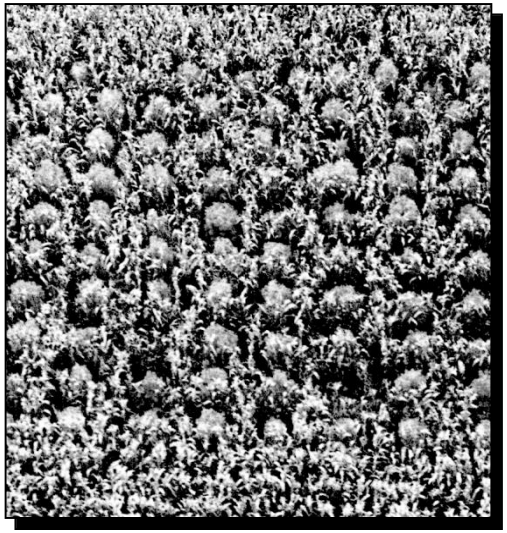


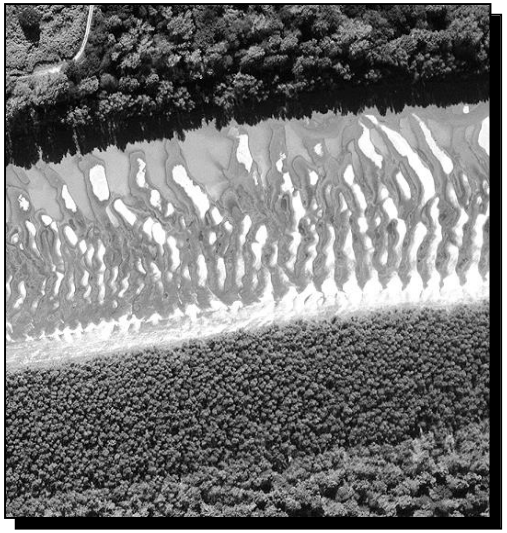




Elements of Image Interpretation - Texture

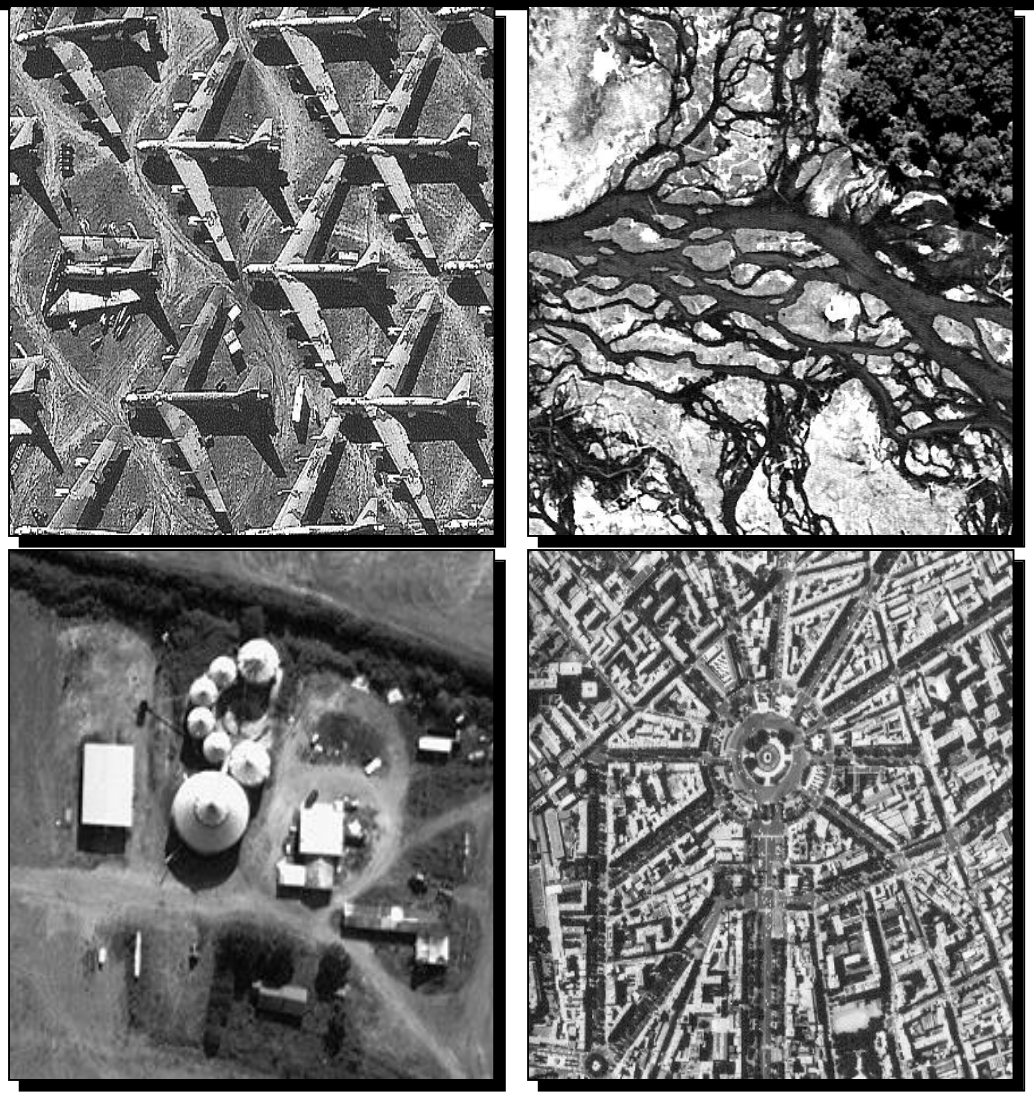






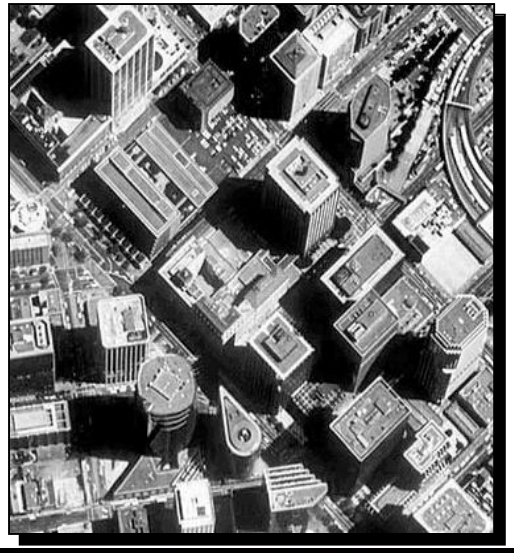
Texture refers to the frequency of tonal variation in an image. Texture is produced by an aggregate unit of features which may be too small to be clearly discerned individually on the image for example maize crop in a image will produce rough texture than rice crop.

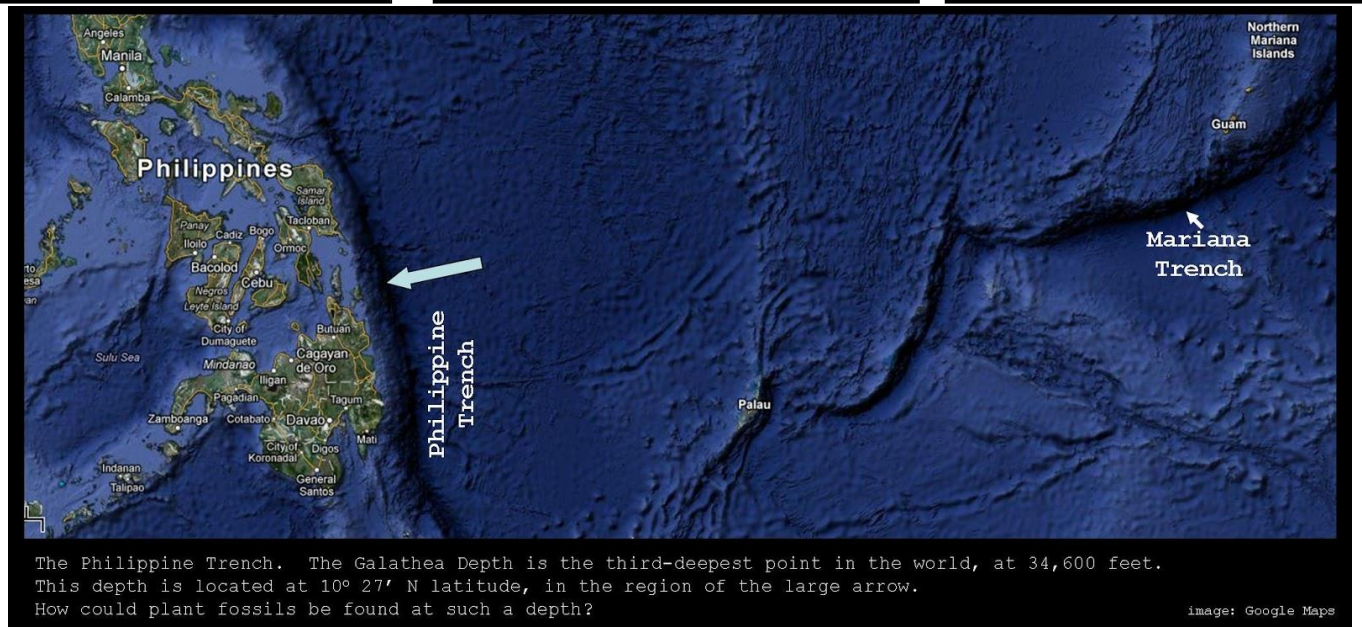
Elements of Image Interpretation - Pattern



Pattern refers to the spatial arrangement of the objects. Objects both natural and manmade have a pattern which aids in their recognition for example delta and city streets

Elements of Image Interpretation - Height and Depth



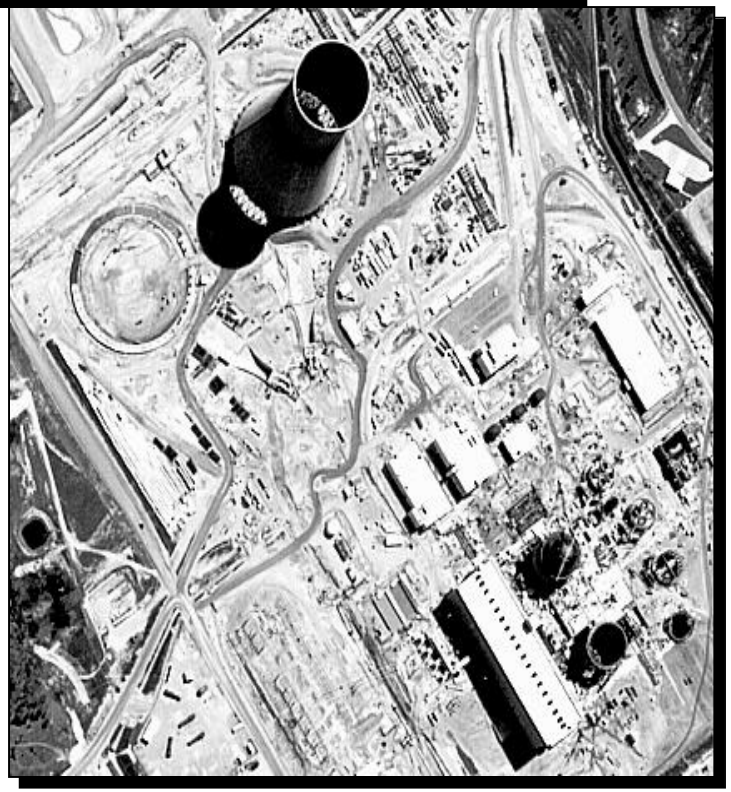


The Philippine Trench. The Galathea Depth is the third-deepest point in the world, at 34,600 feet.
This depth is located at 10º 27′ N latitude, in the region of the large arrow.
How could plant fossils be found at such a depth?

image: Google Maps

Z-elevation (height), depth (bathymetry), helps to infer volume, slope, aspect of object

Elements of Image Interpretation - Site, Situation and Association

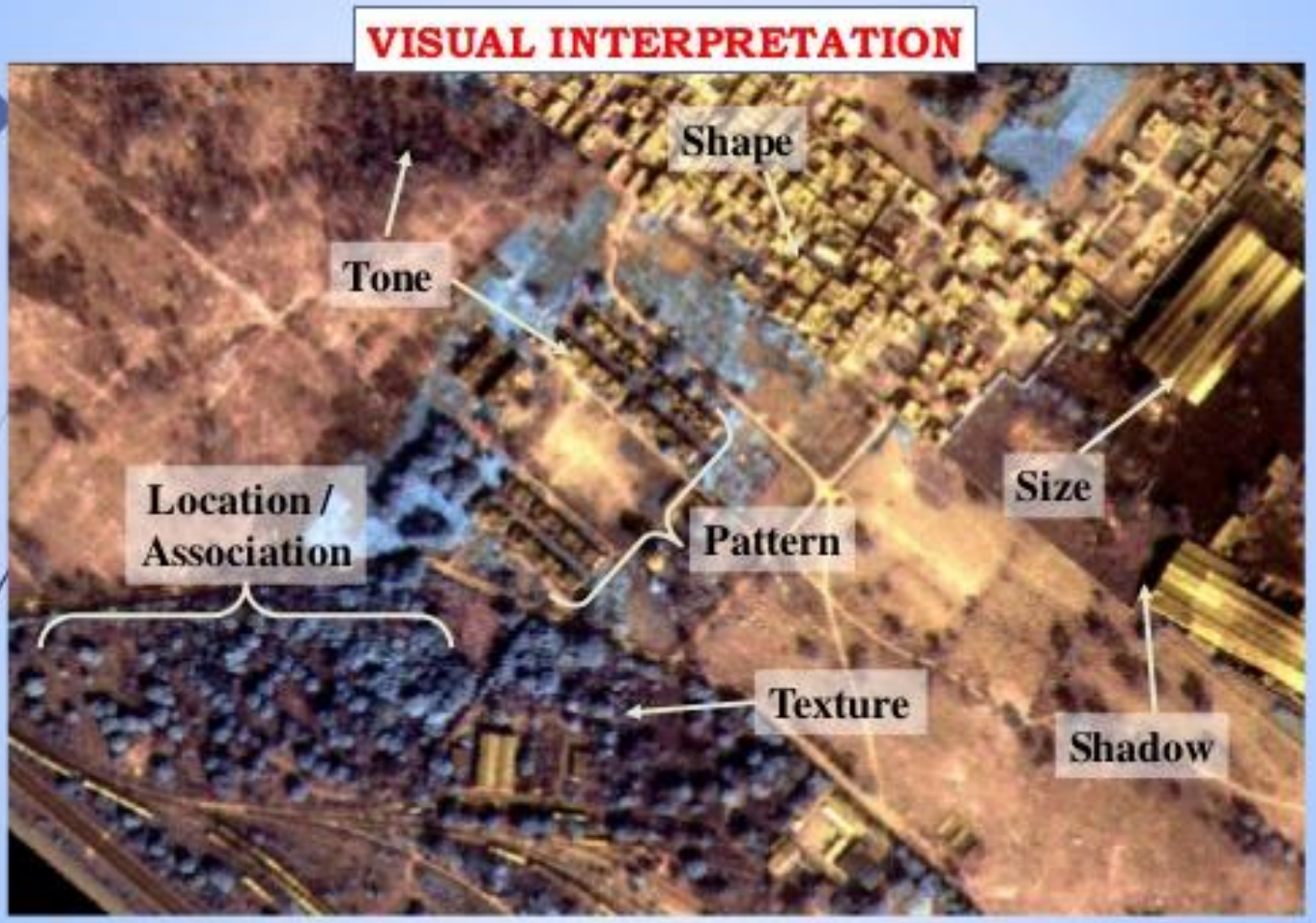


Association refers to the occurrence of certain features in relation to others objects in the imagery for example school is associated with playground.

Situation refers to how the objects in the photo or image are organized and “situated” in respect to each other like tanks, artillery, trenches etc in battle field

Site refers to topographic or geographic location. It is also an important element in image interpretation when objects are not clearly identified using the previous the elements. A very high reflectance feature in the Himalayan valley may be snow or cloud, but in Kerala one cannot say it as snow.

Interpretation Key: Summarized



Primary Ordering of Interpretation Keys