

## UNIT-III

### Aerial Remote Sensing

Aircrafts are used for remote sensing in aerial manner means it is called aerial remote sensing.

### Types of air photographs

There are five types of air photographs:

#### 1. Vertical photographs

These photographs are taken with an air-borne camera aimed vertically downward from the plane. The axis of the camera is perpendicular to the ground surface. This provides a photograph that is parallel to the ground below.

#### 2. Oblique photographic

These photographs have their axes purposely tilted from the vertical. The amount of tilt varies from 30 to 60 degrees. An oblique photograph showing the horizon is called a high oblique. One which does not have the horizon is called a low oblique. Oblique photographs, because of the side-view characteristic they possess, produce a more normal view of ground objects. Oblique photographs help in studying the terrain or ground features having considerable relative relief such as tall structures or slopes.

#### 3. Composite photographs

The photographs are printed from three or more separate negatives which exposed simultaneously by a multilens camera. The multilens camera of usual construction has one lens aimed along a vertical line of sight and other lenses arranged in pairs tilted away from and on opposite sides of the central lens. When printed, the tilt is reversed and the resulting photograph is all in one piece and in the same plane as the portion exposed by the central lens. These photographs cover large areas.

#### 4. Timetrogen photograph

Timetrogen photograph is the result of the combination of three separate photographs exposed simultaneously by three single lens cameras mounted in the same airplane. The central camera takes vertical photographs while the other two take oblique photographs to the right and left of the line of flight. The cameras are so fixed that the entire area from right horizon to the left horizon is photographed. The coverage is not printed as a composite photograph.

#### 5. Sonne's photograph

These photographs are parts of a continuous strip of terrain. This is done by allowing the negative to move continuously over a fixed slit. The speed of the movement of film across the slit is adjusted to the speed and height of the aircraft.

## **Stereoscopic vision**

Looking at the images of features shot from two different angles gives what we call a stereo view or three dimensional view. We have noted how air photography enables each point on the ground to appear at least in two photographs. All air photographs have the characteristics of stereoscopic view. Viewing two air photographs stereoscopically gives the same view of the ground as one will get while looking down from a plane. This enables the user to see the ground more realistically and this is one invaluable asset which air photograph possess.

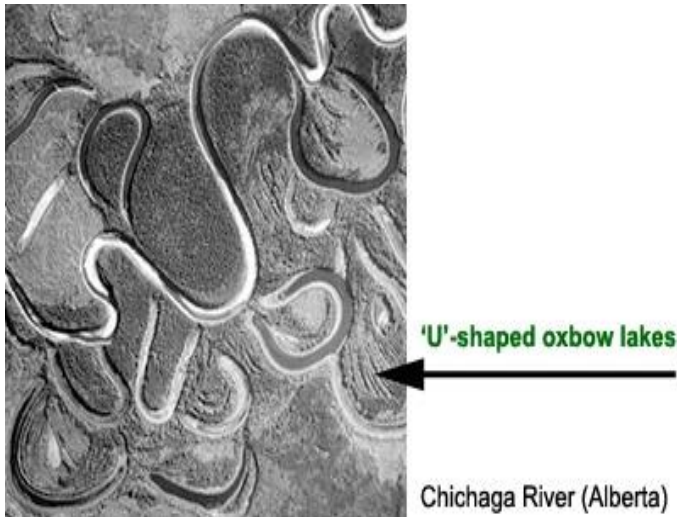
## **Elements of Aerial Photo Interpretation**

The most ideal method of interpretation of aerial photographs is by examination of adjacent pairs of overlapping photographs. This pair of photographs is called a stereogram. A stereogram when seen through a stereoscope reveals to the viewer an image of the landscape shown on the overlap of the two photographs. Photo interpretation directly depends on the analysis of the photo image. The photo image consists of the following elements:

1. Shape
2. Size
3. Pattern
4. Tone
5. Texture
6. Shadow
7. Site/Association and
8. Time

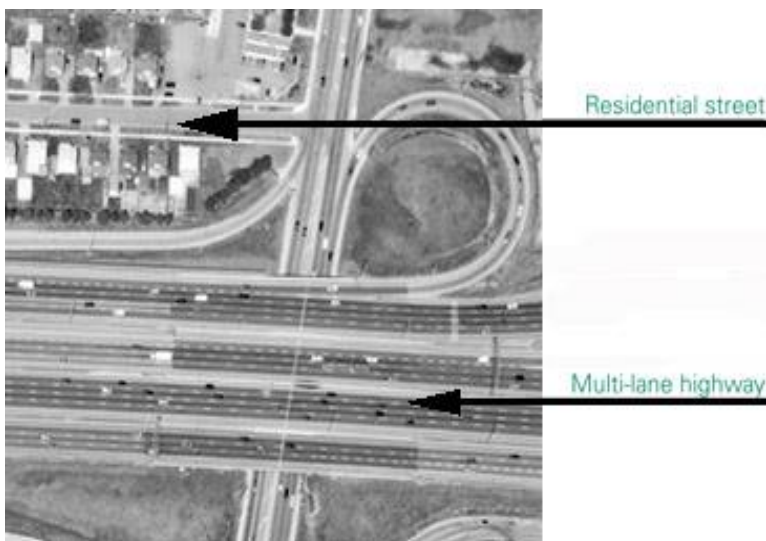
1. Shape

The form of an object on an air photo helps to identify the object. Regular uniform shapes often indicate a human involvement.



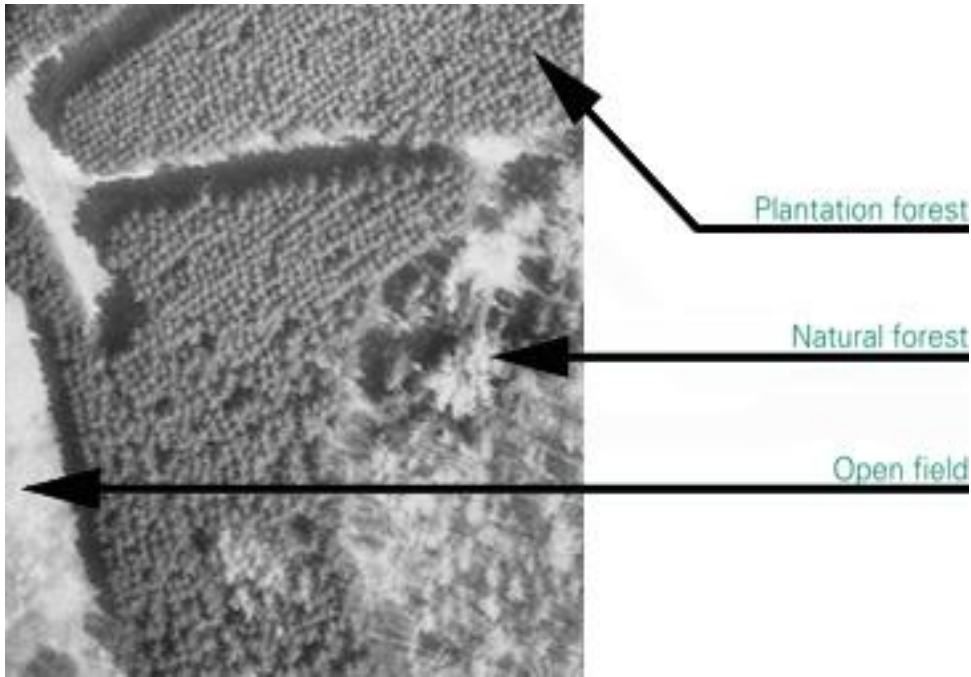
## 2. Size

A measure of the object's surface area (e.g. single-lane vs. multi-lane highways). Size as a quantitative element in interpretation relates to the surface or volume dimension of an object. The relative sizes of images of objects generally help in their identification. The smaller buildings are more likely to be residences. The larger buildings may be commercial, industrial or cultural establishments.



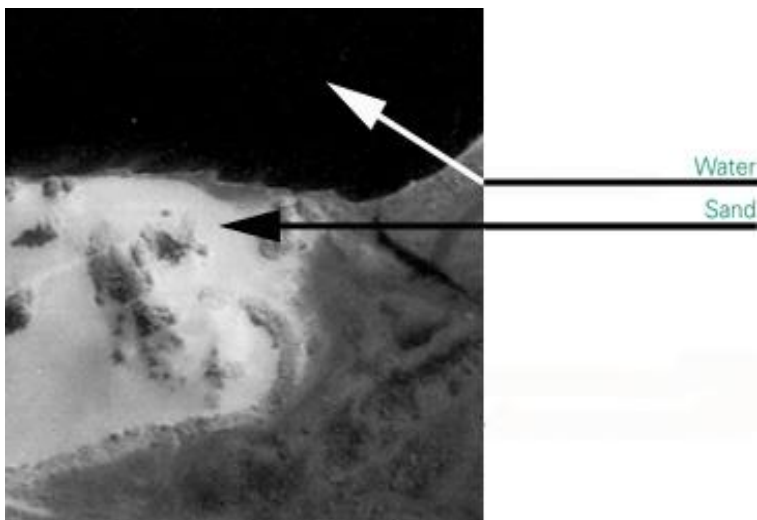
## 3. Pattern

The total arrangement of all cultural and natural features as they appear on the photograph is described as pattern. The individual landscape features or the collections of such features are called the elements of the pattern. Aerial photography helps in the understanding of the patterns of arrangement and the aerial associations. For example the pattern of drainage network gives a definite indication of the underlying rock type, its structure and also the characteristics of soil etc.



#### 4. Tone/Colour

The colour characteristics of an object, relative to other objects in the photo, are used to identify the feature (e.g. sand has a bright tone, while water usually has a dark tone; tree species can be determined by the colour of their leaves at certain times of the year).



#### 5. Texture

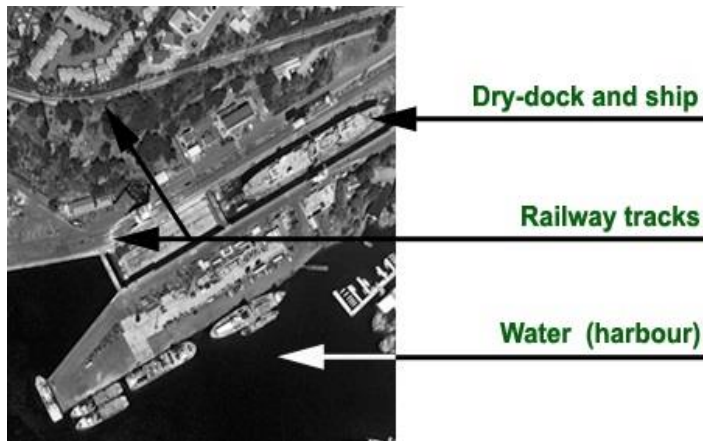
The physical characteristics of an object will change the way they appear on a photo (e.g. calm water has a smooth texture; a forest canopy has a rough texture).

## 6. Shadow

A shadow provides information about the object's height, shape, and orientation (e.g. tree species). Shadow aids in the visualising of the relief dimensions and also in the orientation of the photograph in space.

## 7. Association/Site

Associating the presence of one object with another, or relating it to its environment, can help identify the object (e.g. industrial buildings often have access to railway sidings; nuclear power plants are often located beside large bodies of water).



## 8. Time

Temporal characteristics of a series of photographs can be helpful in determining the historical change of an area (e.g. looking at a series of photos of a city taken in different years can help determine the growth of suburban neighbourhoods).

