

Scales of the photograph

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The concept of scale for aerial photograph is same as that of a map. Scale is the ratio of a distance on an aerial photograph and the distance between the same two places on the ground in the real world. It can be expressed in unit equivalents like 1 cm= 1,000 km (or 12,000 inches) or as a representative fraction (1:100,000). To determine the dimension during air photo interpretation, it will be necessary to make estimates of lengths and areas, which require knowledge of the photo scale.

Scale maybe expressed in three ways

- 1 **Scale ratio:** It is also referred to as the proportional scale. 1:20,000 is read as "one to twenty thousand".
- 2 **Equivalent scale:** Equivalent scale is also known as the descriptive scale. For example: one inch equals 5,280 feet (1 inch = 5,280 feet).
- 3 **Graphic scale:** Also called a bar scale, used on maps and drawings to represent length scale on paper with length units.

Large scale: Larger-scale photos (e.g. 1:25 000) cover small areas in greater detail. A large-scale photo simply means that ground features are at a larger, more detailed size. The area of ground coverage that is seen on the photo is less than at smaller scales.

Small scale: Smaller-scale photos (e.g. 1:50 000) cover large areas in less detail. A small-scale photo simply means that ground features are at a smaller, less detailed size. The area of ground coverage that is seen on the photo is greater than at larger scales.

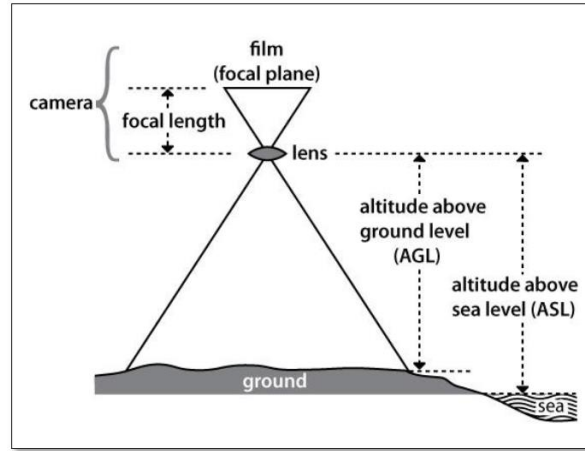
Following methods are used to compute scale of an aerial photograph using different sets of information:

Method 1: Scale is the ratio of the distance between two points on a photo to the actual distance between the same two points on the ground (i.e. 1 unit on the photo equals "x" units on the ground). If a 1 km stretch of highway covers 4 cm on an air photo, the scale is calculated as follows:

$$\text{Photo distane/ Ground distance} = 4 \text{ cm}/1 \text{ km} = 4 \text{ cm}/100000 \text{ cm} = 1/25000$$

So the scale is: 1/25000

Method 2: Another method used to determine the scale of a photo is to find the ratio between the camera's focal length and the plane's altitude above the ground being photographed.



If a camera's focal length is 152 mm, and the plane's altitude Above Ground Level (AGL) is 7600 m, using the same equation as above, the scale would be:

$$\text{Focal length/Altitude} = 152 \text{ mm}/7600 \text{ m} = 152 \text{ mm}/57600000 \text{ mm} = 1/50000$$

So the scale is: 1/50000

Method 3: Scale of the photograph can also be calculated if we know focal length of camera and height of aircraft above the ground level.

$$\text{Scale} = f/H-h$$

Where, H = flying height of aircraft above sea level, h = height of ground above sea level and f is focal length.

