

B. Map Resolution - ability to resolve surface features on a map, depends on scale

Example of Map Resolutions Based on Line Width of 0.5 mm

Line Width (0.5 mm)	Scale	Resolution	Smallest Detectable Object	Area (sq. m) (Minimum)
0.5	1:24,000	12 m	24 m	576
0.5	1:50,000	25 m	50 m	2500
0.5	1:250,000	125 m	250 m	62,500
0.5	1:5,000,000	2500m	5000 m	25,000,000

In-Class Exercise: Spatial Scales and Digital Image Resolution

In remote sensing, a given "scene" is a particular portion of the Earth's surface that is captured in an aerial photograph or satellite image. The digital resolution of the "scene" is the amount of land area that is covered in 1 pixel of the image. Each pixel is assigned a digital color code or shade. When all pixels are combined together a resultant digital image is produced. The resulting image is arranged in a series of columns and rows of pixel boxes.

Problems:

- (1) Given a scale of 1:48,000 on a topographic map, a square plot of land covers 8 inches by 8 inches in map units.

Determine side distances of the plot in meters. $8'' \times 48,000 = 384,000 \text{ in.} \times 2.54 = 975360 \text{ cm}$

Determine the area of the plot in square kilometers. $(9.7536)^2 = 95.13 \text{ km}^2$

- (2) Determine the number of rows and columns in an image of the plot with the following spatial resolutions:

	No. Rows	No. Columns
1 - meter resolution	9754	9754
10-meter resolution	976	976
30-meter resolution	326	326
100-meter resolution	98	98

- (3) If you had an image of the plot that was comprised of 2500 rows and columns, what is the resulting spatial resolution?

3.9 m resolution