

Understanding pixels, bands and channels

Before we get too involved with remotely sensed imagery we need to understand some of the basic components that make up an image. An image is made up of individual elements that are arranged in a grid of rows and columns. These elements are called pixels. In fact, the word "pixel" is derived from "picture element". When we zoom into an image we begin to see these individual pixels (Figure 1).

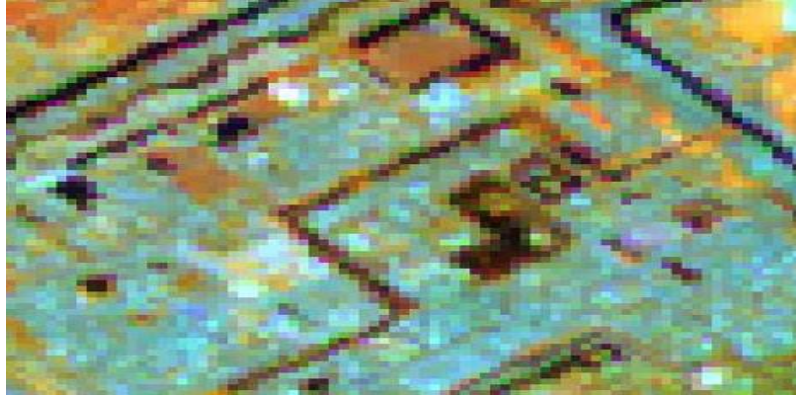


Figure 1: A Landsat Thematic Mapper image that has been magnified by a factor of 6. When zoomed in we can see the individual pixels that make up the image.

Usually when we look at an image these pixels are so small that we do not see the individual pixels (Figure.2)

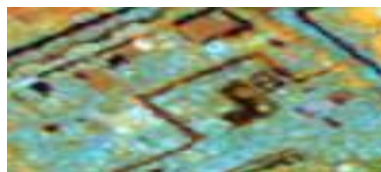


Figure 2: The image used in figure 1 without magnification. Individual pixels are no longer visible.

When we look at an image on the computer screen it appears to be 2-dimensional but in addition to the **rows and columns of pixels**, images also have layers. These layers are commonly referred to as **bands or channels**. The terms "band" and "channel" are used by electrical engineers to describe a range of wavelengths (colors). Since these image layers are created using specific wavelengths of light the terms "band" and "channel" are used in place of layer. Throughout the CBC guides we use the term "band" to refer to the layers in an image, such as a satellite image or an image from a digital photograph. We use the term "channel" to represent the different colors or light that are used to display an image on a computer screen..