


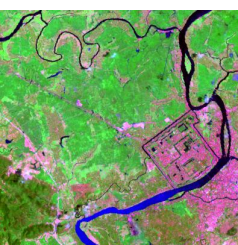
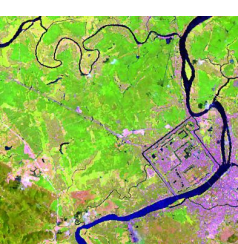


## Common Landsat Band Combinations

Individual bands can be composited in a Red, Green, Blue (RGB) combination in order to visualize the data in color. There are many different combinations that can be made, and each has their own advantages and disadvantages. Here are some commonly used Landsat RGB band combinations (color composites):

	<p><b>3,2,1 RGB</b></p> <p>This color composite is as close to true color that we can get with a Landsat ETM image. It is also useful for studying aquatic habitats. The downside of this set of bands is that they tend to produce a hazy image.</p>
	<p><b>4,3,2, RGB</b></p> <p>This has similar qualities to the image with bands 3,2,1 however, since this includes the near infrared channel (band 4) land water boundaries are clearer and different types of vegetation are more apparent. This was a popular band combination for Landsat MSS data since that did not have a mid-infrared band.</p>
	<p><b>4,5,3 RGB</b></p> <p>This is crisper than the previous two images because the two shortest wavelength bands (bands 1 and 2) are not included. Different vegetation types can be more clearly defined and the land/water interface is very clear. Variations in moisture content are evident with this set of bands. This is probably the most common band combination for Landsat imagery.</p>
	<p><b>7,4,2 RGB</b></p> <p>This has similar properties to the 4,5,3 band combination with the biggest difference being that vegetation is green. This is the band combination that was selected for the global Landsat mosaic created for NASA.</p>
	<p><b>5,4,1 RGB</b></p> <p>This band combination has similar properties to the 7,4,2 combination, however it is better suited in visualizing agricultural vegetation.</p>

### RS/GIS Quick Start Guides

These materials are freely available for use and modification through a Creative Commons Attribution-Share Alike 3.0 License.




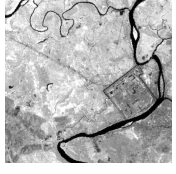



License details: <http://creativecommons.org/licenses/by-sa/3.0/us/>

Version: Original document was created by AMNH-CBC (2003) and adapted to current version by GIF (2008).



## Landsat Spectral Band Information

Landsat images are composed of seven different bands, each representing a different portion of the electromagnetic spectrum. In order to work with Landsat band combinations (RGB composites of three bands) first we must understand the specifications of each band.

	<p><b>Band 1</b>          (0.45-0.52 <math>\mu\text{m}</math>, blue-green)          This short wavelength of light penetrates better than the other bands, and it is often the band of choice for monitoring aquatic ecosystems (mapping sediment in water, coral reef habitats, etc.). Unfortunately this is the “noisiest” of the Landsat bands since it is most susceptible to atmospheric scatter.</p>
	<p><b>Band 2</b>          (0.52-0.60 <math>\mu\text{m}</math>, green)          This has similar qualities to band 1 but not as extreme. The band was selected because it matches the wavelength for the green we see when looking at vegetation.</p>
	<p><b>Band 3</b>          (0.63-0.69 <math>\mu\text{m}</math>, red)          Since vegetation absorbs nearly all red light (it is sometimes called the chlorophyll absorption band) this band can be useful for distinguishing between vegetation and soil and in monitoring vegetation health.</p>
	<p><b>Band 4</b>          (0.76-0.90 <math>\mu\text{m}</math>, near infrared)          Since water absorbs nearly all light at this wavelength water bodies appear very dark. This contrasts with bright reflectance for soil and vegetation so it is a good band for defining the water/land interface.</p>
	<p><b>Band 5</b>          (1.55-1.75 <math>\mu\text{m}</math>, mid-infrared)          This band is very sensitive to moisture and is therefore used to monitor vegetation and soil moisture. It is also good at differentiating between clouds and snow.</p>
	<p><b>Band 6</b>          (10.40-12.50 <math>\mu\text{m}</math>, thermal infrared)          This is a thermal band, which means it can be used to measure surface temperature. Band 6 is primarily used for geological applications but it is sometime used to measure plant heat stress. This is also used to differentiate clouds from bright soils as clouds tend to be very cold. The resolution of band 6 (60m) is half of the other bands.</p>
	<p><b>Band 7</b>          (2.08-2.35 <math>\mu\text{m}</math> mid-infrared)          This band is also used for vegetation moisture although generally band 5 is preferred for that application, as well as for soil and geology mapping.</p>



**RS/GIS Quick Start Guides**  
Collaborative training materials available from the  
Biodiversity Informatics  
&  
Geospatial Innovation Facilities

