

Due Date: 03/02/04

Name: _____

Lab #6: Thermal Infrared Image Display and Analysis

Objective

To analyze a thermal infrared image and understand basic thermal properties and characteristics

This exercise involves the display and analysis of thermal bands (TIR) of an ATLAS image (See the table below). You will be using ERDAS Imagine software for image display. The file that you will be using for this exercise is located in the **S:/GEOG/FACSTAFF/jminhe/RsData** directory. After you have opened an Imagine Viewer, open a file by positioning the cursor over the file to be displayed and press the left mouse button once. The file name should appear in a window above the file names. If you do not see a list of the files with a *.img extension, you are not looking in the correct directory, or the **File Type** has not been specified as IMAGINE Image (*.img).

Before clicking OK when opening an image, make sure the DISPLAY is set to **Gray Scale** and the **Fit to Frame** option is clicked on under the **Raster** option. You may want to click the **No Stretch** option to disable the default 2 standard deviation histogram stretch. This will make the image darker so you can see heat differences more clearly. Remember to use the **Quickview** menu for easier access to commonly used commands. The thermal band you are going to interpret should be displayed in black and white (or gray tones). After you have analyzed the dataset, answer the questions that follow.

File Name	<i>Irmo_atlas971007.img</i>	Spectral	Band 1 = Blue (.45-.52)
Location	Irmo, SC		Band 2 = Green (.52-.60)
Sensor	Airborne Terrestrial Applications Sensor (ATLAS)		Band 3 = Red (.60-.63)
FOV	72°		Band 4 = Red (.63-.69)
IFOV	2.0 milliradians		Band 5 = NIR (.69-.76)
Acquisition Date/Time	October 15, 1998 17:27-18:01 GMT		Band 6 = NIR (.76-.90)
Altitude	5,500 ft AGL		Band 7 = NIR (1.55-1.75)
			Band 8 = MIR (2.08-2.35)
			Band 9 = Removed
			Band 10 = TIR (8.2-8.6)
			Band 11 = TIR (8.8-9.0)
			Band 12 = TIR (9.0-9.4)
			Band 13 = TIR (9.6-10.2)
			Band 14 = TIR (10.2-11.2)
			Band 15 = TIR (10.2-11.2)

Note: TIR stands for Thermal Infrared.

Questions

1. What is the diameter of the circular ground area (spatial resolution), D , viewed at nadir in this image? Please show your calculations.
2. What would be the smallest dimension (in meters) of features you will be able to resolve on the ground?
3. Display and compare Band 6 and Band 11 in separate image viewers. Give a general description of the tonal difference between these two images with respect to residential building roof, commercial building roof, parking lots, roads, and forest. Provide explanation to the differences.
4. On the image of Band 11, notice the roads are in lighter tone than the vegetated areas. Explain why this phenomenon occurs.
5. Also notice the bright salt-and-pepper effect within some forested areas. Explain why there is such an effect.