

Ch 5 Thermal IR Images Read Me

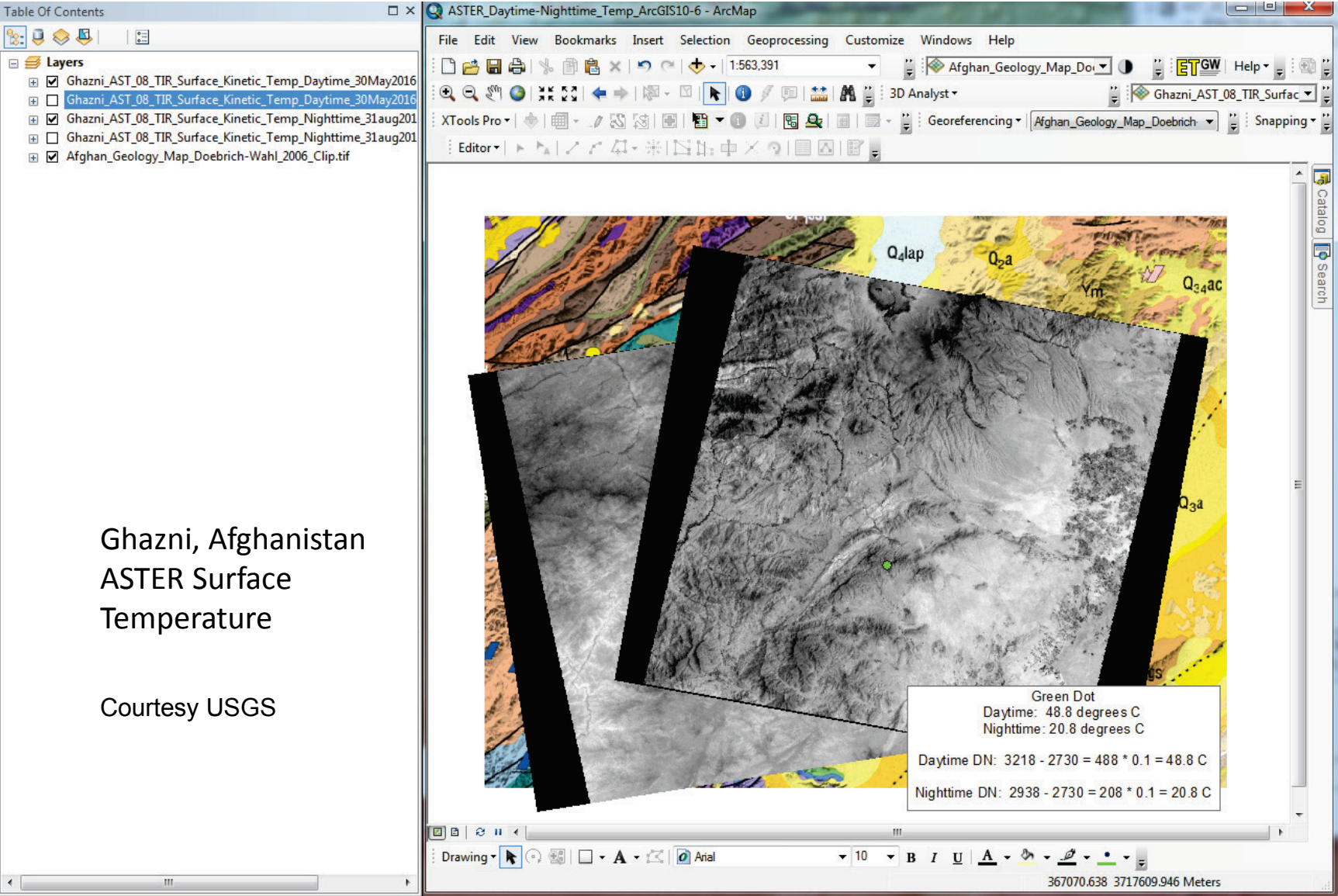
One Dataset is used in Lab 4 of the *Digital Image Processing Lab Manual*

This folder contains:

- ASTER daytime and nighttime surface temperature images of Ghazni, Afghanistan. A geologic map is included along with instructions on calculating temperature in °C from digital number provided with each pixel in the image. ArcGIS .mxd project is included. The daytime surface temperature image was used in the textbook.
- ASTER TIR 5-band data with both radiance and emissivity values for Ghazni, Afghanistan. Emissivity bands are ratioed to provide images that highlight certain minerals. Geologic map provided. ArcGIS .mxd project and layers included. This example is in the textbook.
- ArcGIS .mxd projects in version 10.2 and 10.6.

Background information on ASTER TIR radiance and emissivity images is provided, along with a table showing TIR bands and their wavelengths.

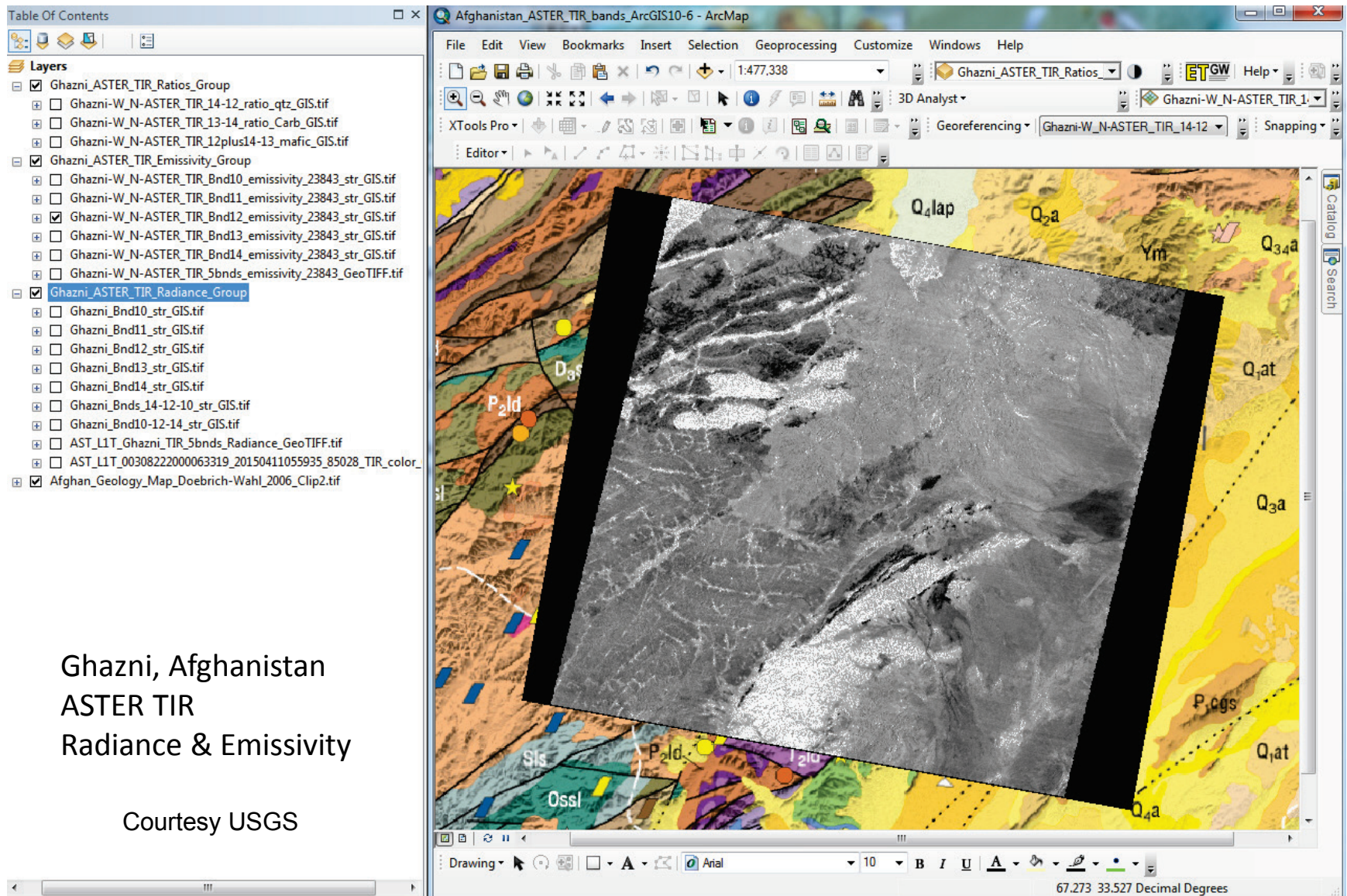
Chapter 5: Thermal IR



Ghazni, Afghanistan
ASTER Surface
Temperature

Courtesy USGS

Chapter 5: Thermal IR



Proposed Lab Exercises

- 1) ASTER TIR Temperature Images, Afghanistan:
 - a) Choose the same pixel in the two georeferenced images that is located in different environments (shadows, sun-illuminated slope, vegetation, etc.)
 - Record the digital number and convert to °C.
 - Compare the daytime and nighttime values. Do they make sense?
 - b) Color density slice the temperature images.

- 2) ASTER TIR 5-band radiance and emissivity bands, Afghanistan:
 - a) Examine the 5 radiance bands and record differences, similarities.
 - b) Examine the 5 emissivity bands and record differences, similarities.
 - c) How do the radiance bands compare to the geologic map?
 - d) How do the emissivity bands compare to the geologic map?
 - e) If software available, create emissivity band ratios for quartz, carbonate, and mafic. How do they compare to the geologic map?