



GEOMATICA

Education Programme



Exploring Band Combinations and Digitizing

Introduction

Welcome to the “Exploring Band Combination and Digitizing” beginner assignment. This assignment was designed to introduce students some of main introductory concepts of remote sensing. Geomatica Focus, an advanced graphical environment image processing software is expected to be used with the data provided to complete this first assignment. While this lab will attempt to guide you through the basics, it is expected that students will investigate and explore the functionality of the various menu options and toolbars independently. Students should also note that PCI has a rich on-line help system that will provide assistance in working through the questions in this lab.

Objectives

- Familiarize with Geomatica Focus Interface
- Understand band combination and image channels
- Identify the differences between vector and raster data
- Gain knowledge of image characteristics
- Master the digitizing, zoom and measuring tools

References

- Visualizing Image Data Lab
- Working with Image Data Lab
- Vector Processing Lab
- [Geomatica Tutorials](#)
- Geomatica Online Help
- [Tutorial: Fundamentals of Remote Sensing](#)

Theory Questions

1. Explain what a band combination is and why are they important? Provide some examples of different band combinations?
2. What is a color composite image? What three bands are represented?
3. Provide the 3 bands that are used in a Landsat 8 false color composite?
4. What is a TIFF file? What other geospatial formats are you aware of?
5. How many bands does a Landsat7 image have? What does each band represent?
6. Look at the metadata of the dataset provided, and list the ground sample distance in both row and column? What other information does the metadata provide?
7. Explain the importance of projection, ellipsoid and datum in an image? What are the differences among these 3 terms?
8. What does UTM stand for and what is it?
9. What is the resolution of an image? What is the projection and resolution of the l7_ms.pix Landsat 7 image?
10. Describe the importance of the instantaneous field of view (IFOV) and the resolution cell?
11. Is the Landsat dataset provided, a panchromatic or multispectral image?
12. Briefly outline the differences between panchromatic and multispectral data?
13. Estimate how many different colors can be seen in a Pseudocolor image?
14. Describe the differences between vector and raster data? Provide 5 examples of each type of datasets.
15. Why are layers important? Provide examples.
16. What are topologies? How are they used?

Practical Exercise

1. Download the dataset provided
2. Open the *I7_ms.pix* file in Focus.
3. Load the image using a true color composite. Explain what is a true color composite? Why is it important?
4. View the image using a false color composite. What features are more noticeable?
5. Use an appropriate band combination to visualize healthy vegetation.
6. Use the Geomatica editing tools to digitize 3 areas that show vegetation. Explain why this band combination is appropriate?
7. Load the image using an appropriate band combination to distinguish urban areas. Digitize 2 buildings.
8. Zoom to a scale of 23,700 on 117d20'43.74"W 33d38'36.52"N, and use the editing tools to finish digitizing the lake. Why is a scale important?
9. Measure the perimeter of the lake, and report it in meters.

Deliverables

1. A document with all the answers to the Theory Questions
2. 1 image of the Landsat true color composite
3. 1 image of the Landsat false color composite
4. 1 map showing the 3 chosen vegetation areas and the 2 buildings
5. 1 map showing the digitized lake, and the perimeter of the lake.