Lab 10: Integrating Imagery with GIS and 3D Geovisualization
Intro GIS

***Objectives*:** In this lab you will learn to:
- change band values to enhance visualization of imagery
- create multi-ringed buffer shapefiles for data analysis
- examine the use of GIS and remote sensing for analyzing volcanoes
- create shapefiles
- edit pre-existing shapefiles
- work with land parcel data
- edit pre-existing shapefiles
- use imagery and 3D symbology for 3D Geovisualization
- examine 'what-if' scenarios regarding new construction

Materials
You will be working with the data in the ***CostaRica*** and the ***Reynolds*** folder in the ***P:/3812*** drive.

Introduction
Remote sensing imagery is rapidly becoming well-integrated with GIS analysis. In this exercise, we will use a Landsat Image to make a map of volcanoes in Costa Rica. We will explore how to enhance imagery within ArcGIS and to examine proximity of volcanoes to urbanized areas.

PART 1. Add the Imagery Data
We will be using Landsat satellite imagery downloaded from the GeoBrain project website:
http://geobrain.laits.gmu.edu:8099/GeoDataDownload/

First, let's create a new folder in your directory in the L: drive called ***CostaRica.***

To begin, launch ArcMap. First, add the following data layers **costa_vol.shp**, **costa_bnd.shp, costa_city.shp, costa_rds.shp.** (Note: you can add all four of the layers at once by holding ctrl down and interactively selecting the layers). Then add **SHADE.tif and WATRCRLS.shp.** Next, add **costa.img** and then save your map document as **CostaRica.mxd** in your ***CostaRica folder*** on the J: drive.

Next, double click on **costa_bnd** to change the Fill color to Hollow. Next, right click on **costa.img** and *click zoom to layer.* Next, right click on **costa.img** and set the Properties to: band 1 = 6, band 2 = 5 and band 3 = 2. The checkbox display background color will be (R,G,B) = 0 0 0 and click OK.

Arrange your layers such that they display properly (e.g., the shaded relief at the bottom, the satellite image above it, and all other layers on top). Next, add proper Symbology to our vector layers (blue hydro networks and black roads) by right-clicking ***Layer name > Properties > Symbology.***

2. Query the volcano layer
Next we will find the historic volcanoes within 100 miles of San Jose, Costa Rica and then find the historically active ones. First, let's open the **costa_vol** attribute table to examine the volcano attributes.