Lab 3

GEPL 4490/5490 Remote Sensing of the Environment

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One of the hardest parts about the field of remote sensing is acquiring satellite imagery. Today, the Internet is the primary source for satellite data. In this lab, we will search for data at the US Geological Survey's Earth Explorer which was paid for with OhioView funding.
http://edcsns17.cr.usgs.gov/EarthExplorer/

The Earth Explorer is a computer system resource for acquiring data for the earth's land surfaces. This computer system allows users to make specific data searches, preview data, and place orders for data. On Earth Explorer you can get Digital Line Graphs, Aerial Photographs, Digital Elevation Models and Satellite images.

When you enter the Earth Explorer web page (you can do it as a guest), you are presented with two panels one on top of the other. The bottom panel permits you to scroll through options of data sets that are available to be searched. If you click on, e.g., **Satellite Imagery**, you will notice that a collection of alphabetized data sets appears, such as Advanced Very High Resolution Radiometer, Corona, Multispectral Scanner Landsat 1-3, Thematic Mapper Landsat 4 and 5 and Enhanced Thematic Mapper Plus (Landsat 7).

1. Think about an environmental phenomena that would be observable given the spatial and spectral resolution of AVHRR data (e.g., Mississippi flooding of 1993, the devastation left from Hurricane Andrew (August 24, 1992), forest fires in Indonesia, or seasonal variations in vegetation greenness for the eastern US, etc).

a. What research project did you choose for your search? Discuss how the 4 resolutions (spectral, spatial, radiometric and temporal) played into your decision to study this topic.

b. What search criteria did you enter to explore data availability in the archive? Please be specific.

To begin a data search, click AVHRR and then Continue at the bottom of the page. You will need to fill in information for each of the boxes

on the page. Enter the areal extent/location of the area of interest, and the time period for the request. These initial queries are general, and a search may be initiated on the few queried attributes. You can choose to draw your area of interest on a map, use the latitude and longitude, or enter the name of the location you what to get data for. If you pick place names, you can only choose from those in the US. If you use the map, there are instructions at the top of the page. Use the pan option to move around the globe. You will also need to specify the number of images you want the search to return. Change the pull down menu at the bottom of the page from 10 to 1000. You will want to get all that you can in order to count the number of good images for "c" below. If you get more than 1000 images, you should constrain your search more.

Once you enter the criteria for your data search, a table will pop-up, showing you all the satellite passes which meet the criteria.

c. How many satellite coverage matches did your search yield?

To preview an image, click on **show** in the far left column of the table corresponding to the satellite scene you wish to preview. You can also show a map of the coverage extent for the scene of interest, and the location of your search point/area within the scene.

d. Take a look at several of the images. Is your study area in the center of every image? If not, what might be the implication for the study of your area?

e. How will cloud cover affect your images?

2. Go to the GLOVIS web page http://glovis.usgs.gov/. Find path 231, row 67. Go to path 231 and row 67. You will need to click on "View Images" at the top of the page and then enter the path and row in the left hand side.

a. What do you see in the image? What caused this pattern given your knowledge of where you are in the world?

b. Look around the other areas of the world and find something that you think is neat. Copy and paste the image into power point and label it with its path/row and date. Also, title the image with what is interesting about the image. Include the image when you hand in your lab.

http://dmc.ohiolink.edu/GEO/LS7/ OhioLINK – free Landsat-7 images of Ohio.

3. Go to the OhioLINK web site and answer the following questions.
   a. Which path and row for Ohio has the most scenes archived?
   b. Which path and row has the least scenes archived?
   c. For path 19, row 31 (Northwest Ohio) there are two things that are causing the white color of the False Color Composite "Near-Infrared Composite" for December 31, 1999. What are they? Zoom in and out to be able to tell.

4. I want you to create 1. an aerial photography, 2. Landsat satellite image and 3. a topographic sheet for your favorite place in Ohio, Indiana, Michigan, Pennsylvania, Kentucky or West Virginia that is visible in the OhioView images. You can use various web sites below. Put the images into Power Point and email your response to me at jcoss@utnet.utoledo.edu

Use the following web sites:
http://terraserver-usa.com/ - Microsofts Terraserver for aerial photograph and toposheets of the same area.
http://dmc.ohiolink.edu/GEO/LS7 - OhioLINK for Landsat 7 imagery with link to Topozone toposheets.

5. Look up on the internet Kepler's 3 Laws of Motion. Write a paragraph explaining each.