

LAB I
Geography 177
Remote Sensing of the Environment
September 9, 2002

Log on to one of the **IBM** machines in the instructional lab.

- **Login at IBM Machine.**
- **Choose the "X-Win32" icon**
- **Choose the "X-win-ubeh..." icon**

Note that the data directory, student directory, and web directory for this course are located at:

```
/afs/isis/html/courses/2002fall/geog/177/001/data  
/afs/isis/html/courses/2002fall/geog/177/001/students  
/afs/isis/html/courses/2002fall/geog/177/001/www
```

The location `.../data` is the directory from which you will copy files for the lab assignments. So, within this directory you will find files that you can copy to your own working directory using a command like the following:

```
> cp /afs/isis/html/courses/2002fall/geog/177/001/data/'file' 'file'
```

Speaking of working directories, I suggest that you create one inside of your student directory. To do this, first change into your personal directory under `/students`. Now, if your student directory is `/jones`, you may not want it to get too cluttered up, so create a working subdirectory for this lab called `/lab1`:

```
> mkdir lab1
```

You can then move into that directory:

```
> cd lab1
```

and then implement the `cp` command from there. So create a working directory for yourself, go into it, and copy the files `AGSB.ipw` and `SCI.ipw`.

Let's take a moment to reflect on the fact that there are limits to available disk space. Using up excessive quantities of disk space can lead to unwanted nicknames such as `diskhog`, `disksquatter`, and even worse. So please keep your directories clear of redundant and/or unnecessary files.

Here are some **UNIX** commands that may come in handy along the way:

ls	lists files
rm 'filename'	removes a file
mkdir 'directoryname'	makes a directory
cd 'directoryname'	changes directories
cd ..	moves back one directory level

cp 'oldfilename' 'newfilename'	copies files
mv 'oldfilename' 'newfilename'	moves files
more 'filename'	allows you to view the contents of a file
'function' > 'file'	directs result from a function into a file
'function' < 'file'	directs a file into a function
'function' 'function'	pipes result of function to other function
&	runs command in the background

Here are some **IPW** commands that we will use today and in the future.

ipw	lists all the ipw commands available
ipwman	provides instructions for using any given ipw command
mkbih	produces an ipw header for a binary image
rmhdr	removes the ipw header from a binary image
mux	combines separate bands into one multiband image
demux	extracts individual bands from a multiband image
atob	converts from ascii to binary
btoa	converts from binary to ascii
ipwtool3	an image visualization and exploration tool
xv	another image visualization tool

For this lab you will:

- make a working directory
- subscribe to **ipw** and **xv** (*ipm add ipw; ipm add xv*)
- copy the image **AGSB.ipw** into your working directory
- look at **AGSB.ipw** using **ipwtool3**
- do some simple exploration of **AGSB.ipw** (zoom, histogram, scatterplot)
- extract a single band of data from the six band image **AGSB.ipw** using **demux**
- remove the header from the single band of data using **rmhdr**
- convert the single band of data into ascii using **btoa**
- reconvert the ascii data into binary using **atob**
- put a new ipw image header on the binary file using **mkbih**
- examine the resulting image using **ipwtool3**
- compare the image to the ascii file that you can read using **more**

When you've done all of that, create a 6x6 ipw image for which 1/3 of the values are 0's, 1/3 are 127's and 1/3 are 255's. Call it silly.ipw and save it in your working directory. Open silly.ipw using ipwtool and create a histogram for it. Save the histogram into a file called silly.hist.