GEPL 4500/5500
Lab 1 Geo-rectifying Imagery
Due Wednesday March 2, 2005

Geo-rectifying an image:

You will be creating a geo-referenced images in this lab. The goal of this lab is to introduce you to the various methods image to image and image to map geo-referencing. ArcView and ArcGIS both have the ability to impart upon an image, a geographic reference system.

The process is easy. Find feature locations in the world and locate those features in the imagery. Relate the locating in the world with the raster location and develop a regression from that relationship.

YOU MUST BECOME FAMILIAR WITH THE HELP FILES. To succeed in this lab you will must search out the answers in the help files. Once this is mastered you will essentially free yourself from a single software platform. This means however that you must have a fairly solid idea of what your are trying to accomplish.

Instruction:

Copy the Lab 2 directory to your local directory from the //gisag98/gepl5500/lab2dat this will have all of the files you will need.

For this first step we will be using an Landsat8_8_02.tiff

1. Open the shapefile mjwater.shp. this will open up the an unprojected shape of the major water of the United States. You may want to project this file, the native projection for Landsat path 20 row 31 is what? Next open up the Landsat8_8_02.tiff file as an Image Analyst file. to do this you will need to check the Image Analyst extension in ArcView and when you open an image to be used in Image Analyst you well drop down the Data Source Type to Image Analyst Data Source.

Q1. Where is the Landsat image image when you first place it in Arcview, why doesn't it line up?

Note the Align tool this is your GCP control tool

click it once to get the image to line up and now locate points on the image click and drag that point to it location in the shapefile and note that the image shifts.

Q2 what are the limitations of the ArcView geo-referencing tool? What of the shapefile, what limitations have you noted.?

Save a referenced file in your directory, call it LandsatAVwarp.img and take a screen capture of the shapefile and image warped.
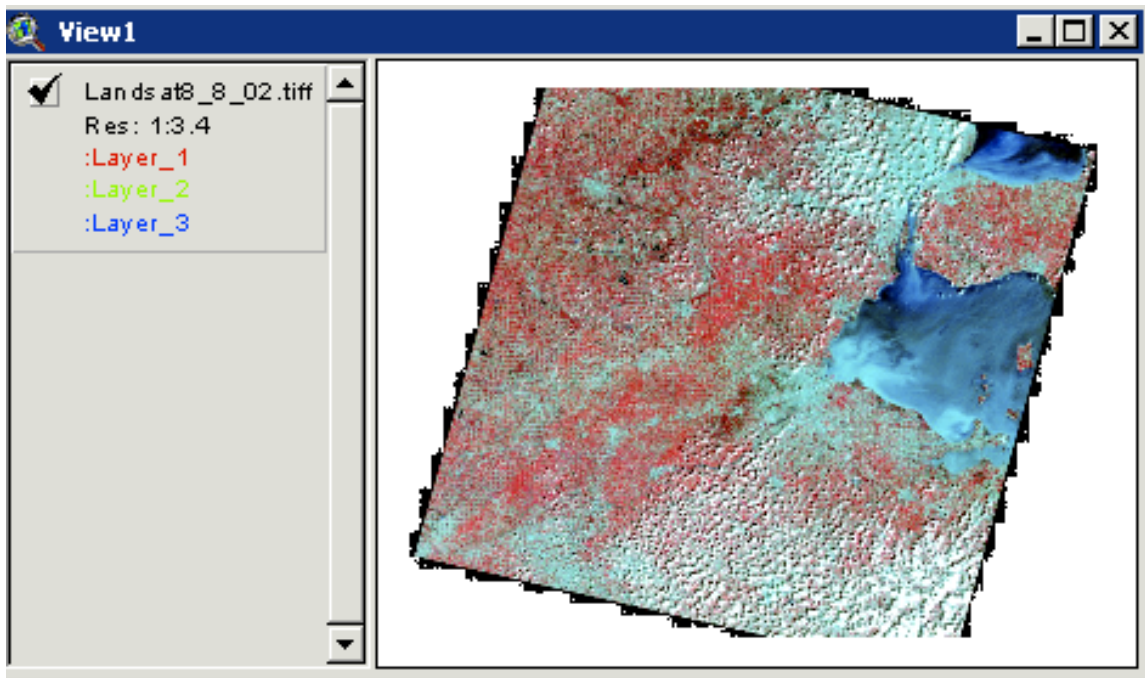
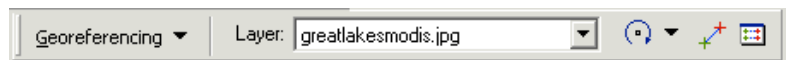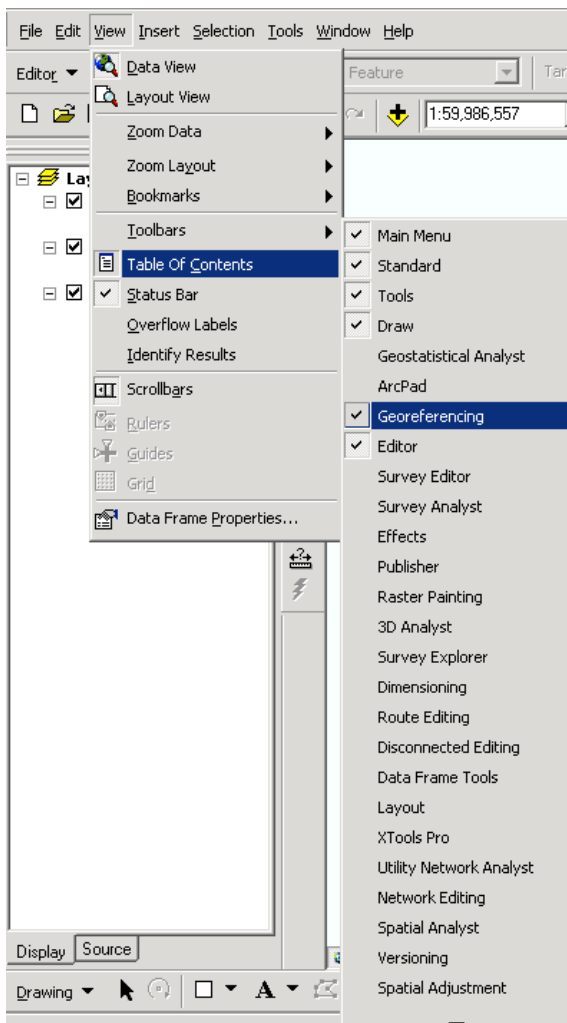2. Now you will warp the Modis image of the Great Lakes using ArcGIS.
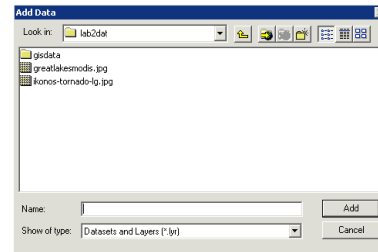
For this you will add the mjwater.shp and the mjrrds.shp these are in the gisdat directory.

Then add the greatlakesmodis.jpg to your map

Make sure that the geo-referencing tool is turned on, see below:

So that this toolbar shows up.

You will magnify the area you know to be roughly in the bounds of your image on the shapefile and then you will fit to display. You may make rough affine adjustments with the circle arrow tool click that and see the tools available in that tool box. When the image is roughly the same
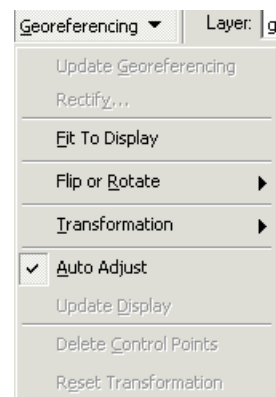
size as the shape file you may then use the 2 plus sign tool to make a point IN THE IMAGE AND THEN ON THE SHAPEFILE. Again this will begin to warp the image.

Q3. what is the tool to the left of the GCP tool (The 2 plus symbols tool)? What can you do with that tool?

Add as many GCPs to get the image as close to the shapefile as possible.

Q4. What projection is the image rectified to, what problems might be associated with that, should you change the projection and to what and why?

Save the rectified image in your online folder.

3. You will now do 2 more image rectification techniques in Envi using the landsat images. There are 2 landsat images one rectified one not. Open 2 displays with the 2 landsat images and you will preform an image to image rectification. you will need to consult the help function to see how to preform this rectification.

3b. After you save the rectified file in your online directory. You will you will create and image-to-map using Envi and Topozone and the landsat image, again you must consult the online help to guide you through this. **Save both rectified images in your online folder.**

Q5 How did your choice of GCPs change from the image-to-image from the image-to-map? How might this effect your warping?

4. Finally, you will geo-reference the Ikonos image of Tornado damage. You may choose any tool you like, geo-reference this image, and measure the approximate area of damage. caused by the tornado. Hint the cross roads exist at approximately 35.34N 97.49W Ok City 232762E 3912769N

Q6. What is the total area of tornado damage?