January 1998 directions by Michael Hamer on how to get older GLORIA images (such as Hawaii) into Arc/Info.

Michael is no longer with the USGS. Any questions should be directed to Florence Wong (fwong@usgs.gov).

The enclosed GLORIA images can be imported into Arc/Info and ArcView using the information found in the .lbl and .xyc files. The images are raw raster format with no header information as part of the file. Arc/Info and ArcView recognize these images as .bil format. To display the files the user will need to create a .hdr file with display parameters. For a full understanding about image display consult the appropriate documentation in Arc/Info or ArcView.

Below is an example of header files found on this CD for a particular GLORIA image. Information from these two files is used to construct a .hdr file for Arc/Info or ArcView.

The following example is from the Hawaii GLORIA quad H1Q1.RAW:

The contents of H1Q1.LBL file:

```
FILE_TYPE          = IMAGE
IMAGE_LINES          = 4634          <- number of rows
LINE_SAMPLES         = 4353          <- number of columns
IMAGE_POINTER        = H1Q1.RAW      <- image file name
SAMPLE_BITS          = 8             <- 1 byte data, grayscale
END

# Projection Parameters for SE Hawaiian Ridge GLORIA quads
#   Projection = Lambert Conformal Conic
#   Geoid      = WGS 84
#   Standard Parallel 1 = 18 N
#   Standard Parallel 2 = 29 N
#   Standard Meridian   = 160 W
# Pixel resolution = 50 meters
```

The contents of H1Q1.XYC file:

```
23  -153                    <- upper left latitude / longitude
     1.0000   228.0000      <- upper left pixel corresponding to upper left latitude / longitude

23  -151                    <- upper right latitude / longitude
4077.0000       1.0000      <- upper right pixel corresponding to upper right latitude / longitude

21  -151                    <- lower right latitude / longitude
4353.0000  4403.0000        <- lower right pixel corresponding to lower right latitude / longitude

21  -153                    <- lower left latitude / longitude
 216.0000  4634.0000        <- lower left pixel corresponding to lower left latitude / longitude

*150
```

Displaying the image

To construct the .hdr file use the following fields:

```
nrows 4634              /*  from IMAGE_LINES found in .LBL file
ncols 4353              /*  from LINE_SAMPLES found in .LBL file
nbands 1                /*  this is default can be left out
nbits 8          /*  this is default can be left out
byteorder M             /*  I for PC's
layout bil              /*  this is default can be left out
skipbytes 0             /*  this is default can be left out
xdim 50                 /*  pixel resolution in meters
ydim 50                 /*  pixel resolution in meters
bandrowbytes 4353 /*  same number as ncols
totalrowbytes 4353          /*  same number as ncols
bandgapbytes 0              /*  this is default can be left out
```

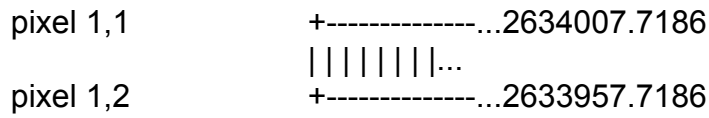
That is all that is needed to display the image.

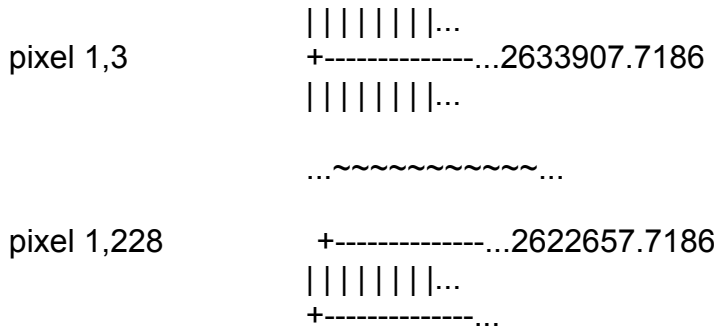
Georeferencing the image

The two header parameters, ulxmap and ulymap, are used to georeference the image. To calculate their values use the information found in the .XYC file. You need to calculate the real world coordinate for the upper left pixel of the image, i.e. pixel (1,1). The value for the pixel will not necessarily correspond to the corner of the GLORIA image that is being displayed due to the rotation that is induced by the projection the image is in. In the above example the value for pixel (1,228) is longitude (x) -153.0 and latitude 23.0 (y). These geographic coordinate will need to be projected into the projection listed in the .LBL file to get real world projected units. For the above values, based on the Lambert Conformal Conic projection, longitude of -153.0 = 714119.6595 projected meters and latitude of 23.0 = 2622657.7186 projected meters. With a pixel resolution of 50 meters the coordinate for the upper left pixel (1,1) of the image is:

value of x for pixel 1 is 714119.6595

value of y for pixel 228 is 2622657.7186.
To calculate the value of y for pixel 1:
There are 227 cells from pixel 1 to pixel 228,
227 x 50 meters per cell = 11350 meters difference
2622657.7186 + 11350 = 2634007.7186.





ulxmap 714119.6595
ulymap 2634007.7186