Subject: Finding pixel values of GeoTIFF image based on lat/lon (ENVI and IDL give different results).
Posted by Sobriquet on Mon, 05 Nov 2012 17:47:14 GMT

Hi,

I know this is a relatively simple task but I'm still new to IDL and have been unable to find an appropriate answer to the problem.

I have ~700 GeoTIFF images of dimensions around 4000x4000.I have the lat/long coordinates of 9 points from which I need to extract information. The images are projected on the Albers Conical Equal Area projection. I need to find the closest pixel value (sample, line image coordinates) that matches the lat/lon pairs. I previously used the approach described here: http://www.idlcoyote.com/map_tips/pixel_to_ll.html

However, I was unable to find a matching pair of lat/long in both arrays or convert the closest match between the two to pixel coordinates.
I, then, tried searching through the images using this code:

```
RES = 100./1.

IMGDATA = READ_TIFF(data_FILES[I], IMAGE_INDEX = 0, GEOTIFF = geotag)
S = SIZE(IMGDATA, /DIMENSIONS); image size

 FILE_POS_data = STRSPLIT(data_FILES[I], '\', /EXTRACT, COUNT = POS_data)
 FILE_NAME = STRMID(FILE_POS_data[POS_data-1], 0, 15)

 RESOLUTION = geotag.MODELPIXELSCALETAG[0] / RES
 xmin = geotag.MODELTIEPOINTTAG[3] / RES
 ymax = geotag.MODELTIEPOINTTAG[4] / RES
 ymin = ymax - (N_ELEMENTS(IMGDATA[0,0,*])) * resolution

 PTLAT = my_lat
 PTLON = my_lon

 alberMap = MAP_PROJ_INIT('Albers Equal Area Conic', $
    DATUM=8, $ ; WGS84
    SPHERE_RADIUS = 6378137.0, $ ; Earth's equatorial radius, or semi-major axis according to
WGS-84
    CENTER_LAT=geotag.PROJNATORIGINLATGEOKEY, $
    CENTER_LON=geotag.PROJNATORIGINLONGGEOKEY, $
    STANDARD_PAR1=geotag.PROJSTDPARALLEL1GEOKEY, $
    STANDARD_PAR2=geotag.PROJSTDPARALLEL2GEOKEY)

  result = MAP_PROJ_FORWARD(ptlon, ptlat, MAP_STRUCTURE=alberMap)
  ptx = result[0, *]/RES
  pty = result[1, *]/RES
```

```
x = FLOOR((ptx - xmin ) / resolution)
y = -(FLOOR((pty - ymin) / resolution))

PRINT, x,y,resolution

results = IMGDATA[x-1,y-1]
```

The problem is that when I double check the results using the same latitude and longitude in ENVI I get different results/pixels.

For example, when I input the my_lat/my_lon pair (64.7000, -148.23300) in the IDL code, I get a pixel value of 3164 and a sample/line value of 805, 2501. However, when I open the image in ENVI and change the projection to lat/lon, I get a pixel value of 3122, and a sample/line value of 813,2495. This might be different because ENVI could be using a different reprojection scheme than IDL.

When I check for the lat/lons that get approximated for the sample/line combinations in ENVI, I get that:

My_lat, mylon = 64.7000, -148.23300

ENVI gives me more precise results, and although a difference between 3164 and 3122 is relatively small, other images and coordinate pairs give me more wildly varying results (some have a difference of 1500, 2000).

My questions are these:

Is there any method to reconcile this discrepancy in my IDL code?
What is the reprojection scheme that ENVI uses to change from ALBERS to lat/lon, and that could explain the difference?

Any suggestions would be greatly appreciated.

Thanks.