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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

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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](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
```

```
ymin = geotag.MODELTIEPOINTTAG[4] / RES
```

```
ymin = ymin - (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.

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