Subject: ENVI Navigating GeoTiff Image Incorrectly?
Posted by David Fanning on Wed, 26 Oct 2011 21:08:43 GMT
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Folks,

Has anyone ever compared ENVI's map projection routines with IDL's? (I am speaking about Map_Proj_Init, not Map_Set.)

I have spent the past couple of days working with a GeoTiff image and my active contouring software. I am trying to produce output that matches the output from ENVI. I know, for example, that ENVI counts from 1 and not 0, and that the origin is in the upper left corner (where it is suppose to be!) and not in the lower left corner as in IDL.

But, even so, I have not been able to reconcile my results with ENVIs. And now I have come to the conclusion that ENVI is just plain wrong. :-)

Here is what I have done. I have a GeoTiff image (which I can provide, if anyone is interested). And, Lord knows, I *know* how to navigate a GeoTiff image!

You get the tie points, which locate the upper-left corner of the upper left pixel. This locates the upper and left boundary of the image. Then you read the X and Y pixel scales out of the Tiff file. I my case, these are both 2.0 meters (a pixel is 2 meters square). If you multiply the size of the image by the pixel scales, you will obtain a value that marks the lower and right boundaries of the image.

Consider a 10x10 image that used 1 meter scales. If the upper-left corner of the upper-left pixel was located at (0,0), then the lower-right corner of the lower-right pixel would be located like this:

```
s = Size(image, /Dimensions)
x1 = x0 + s[0]*xscale
y1 = y0 + s[1]*yscale
```

IF x0 and y0 were equal to 0, and xscale and yscale were equal to 1, then the (x1,y1) point would be (10,10). You would say the boundaries of this image were 0 and 10 in both X and Y directions.

This is *exactly* what I do for the GeoTiff image. In my image the tie point (x0,y0) is located at (519279,7443030), and I calculate the (x1,y1) location for this 800x800 image as (520879,7441430). Note that if you subtract these values, you get 1600 in both X and Y dimensions, as you would expect.

ENVI, uses the very same (x0,y0) point, but calculates the (x1,y1) point as (520877,7441432). In other words, ENVI is one pixel short in X and one pixel long in Y!! (To get the ENVI values, I used the Pixel Locator and entered 800 in both the Sample and Line positions.)

But, my interest was really in locating an ROI in the image. To investigate this, I made a sample feature by creating a 25 pixel on a side square near the center of the image. And then I calculated the projected XY locations of the four corner pixels of this sample feature.

If you assume that the pixel index number identifies the center of each pixel, then you could investigate the size of the feature by subtracting the projected XY locations. When I did this is my code, I found the sample feature to be 48 meters on a side, exactly as I expected. (Centers, remember, not edges.)

When I calculated the same values in ENVI I found the feature to be 48 meters in X, but only 44 meters in Y!!!

I don't have ANY idea how to explain this descrepancy, except to say I *know* my values are correct and I know the values I am getting from ENVI are wrong. I conclude that ENVI is navigating this GeoTiff image incorrectly which is causing me a great deal of distress when I try to match these ENVI values! :-)

Cheers,

David

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Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thui. ("Perhaps thou speakest truth.")