Subject: trouble with map projections
Posted by chris.orphanides on Thu, 20 Jun 2013 18:37:06 GMT
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Hello,
I am trying to take a satellite image of sea surface temperature (SST), subset it, and then project it, and I can't seem to get it right. I am able to read the image and subset the area I am interested in without a problem. Getting it projected and having things line up is another story.

What makes sense to me is first using the map_proj_init function to create the map projection I want to put the image into (Lambert Conformal Conic), then use the map_proj_image function to warp the image to the proper projection. However, when I do this, the resulting array has lost its SST values and is all 0.0s. Can anyone tell me what I am doing wrong? I have experimented with many of the mapping capabilities in IDL, but I just can't get it right. The code I described is below Thanks in advance for your help.

```
range = [-78.1900, 34.0300, -61.8100, 45.4900]

nec_prj = MAP_PROJ_INIT('Lambert Conformal Conic', /GCTP, $
          ELLIPSOID='WGS 84', $
          LIMIT=range, $
          CENTER_LATITUDE=40.00, $
          CENTER_LONGITUDE=-70.00, $
          STANDARD_PAR1 = 36.1667, $
          STANDARD_PAR2 = 43.8333 )

necprj_sst = MAP_PROJ_IMAGE(nec_region, range, MAP_STRUCTURE = nec_prj)
;  nec_region is the SST data for the region I am interested in,
;  subset to fit the range in the lines above
```

A little additional information: The main input image before I subset it is described as being in a Cylindrical Lat-Lon projection with a regular 0.01 degree grid and a WGS 84 Ellipsoid. Since Cylindrical is the default IDL projection I didn't set a map projection for this image. I would prefer to set the ellipsoid to WGS 84 for the Cylindrical projection, though it doesn't appear possible in IDL (I would love it if I was wrong about this). Also, I am working with the type of images described here: (http://podaac.jpl.nasa.gov/dataset/JPL_OUROCEAN-L4UHfnd-GLOB -G1SST)

Thanks.

Chris

Subject: Re: trouble with map projections
Posted by David Fanning on Thu, 20 Jun 2013 19:25:20 GMT
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chris.orphanides@noaa.gov writes:

> I am trying to take a satellite image of sea surface temperature (SST), subset it, and then project it, and I can't seem to get it right. I am able to read the image and subset the area I am interested in without a problem. Getting it projected and having things line up is another story.
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As the Stooges would say, "No, no, no. You're doing it all wrong!"

You need to create a map projection that describes your image as you downloaded it. I'm not sure why you think IDL can't do a Cylindrical map projection with a WGS-84 ellipsoid, but this is a VERY common projection for satellite images and IDL handles it perfectly. Then, you create a map projection for what you want the image to end up as. Finally, you use Map_Image to warp the image from one map projection to the other. Here is an article that describes the process:

http://www.idlcoyote.com/map_tips/warpimage.html

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: trouble with map projections
Posted by chris.orphanides on Thu, 20 Jun 2013 20:50:54 GMT
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On Thursday, June 20, 2013 3:25:20 PM UTC-4, David Fanning wrote:

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> (SST), subset it, and then project it, and I can't seem to get it right.
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> --
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> David Fanning, Ph.D.
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> Fanning Software Consulting, Inc.
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> Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
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David, thank you for your quick response. I didn't think that I could do a Cylindrical map projection with a WGS 84 Ellipsoid because in the map_proj_init() help page it lists Sphere as the only available ellipsoid when using IDL's own map projections. In the GCTP map projections it says that Equirectangular only takes a sphere as well and doesn't say you can specify the semimajor or semiminor axes. What am I missing here? Does the below work even though it doesn't seem like it should?

g1_prj = MAP_PROJ_INIT('Equirectangular', ELLIPSOID='WGS 84', /GCTP, LIMIT=[-80, -180, 80, 180])

It runs successfully, and when peeking at the result some of it looks right, but I am hesitant.

Subject: Re: trouble with map projections
Posted by David Fanning on Thu, 20 Jun 2013 21:20:27 GMT
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chris.orphanides@noaa.gov writes:

> David, thank you for your quick response. I didn't think that I could do a Cylindrical map projection with a WGS 84 Ellipsoid because in the map_proj_init() help page it lists Sphere as the only available ellipsoid when using IDL's own map projections. In the GCTP map projections it says that Equirectangular only takes a sphere as well and doesn't say you can specify the semimajor or semiminor axes. What am I missing here? Does the below work even though it doesn't seem
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Ah, yes, I guess I was thinking of a Cylindrical Equal Area projection,
which was introduced in IDL 8.0.

Yeah, you're probably screwed. :-)

You probably have to use ENVI to get your map projections right. I have NO idea my MAP_PROJ_INIT allows that ellipsoid, although in the back on my mind I seem to remember a change that allowed any ellipsoid with map projections. But, I can't find any mention of it anywhere. Sorry!

I guess your only solace is that on a map with those limits, the difference between a sphere and a WGS84 ellipsoid are going to be very small. I've seen a hell of a lot worse in scientific papers. :-)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.idlcoyote.com/
Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: trouble with map projections
Posted by chris.orphanides on Fri, 21 Jun 2013 00:05:34 GMT
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On Thursday, June 20, 2013 5:20:27 PM UTC-4, David Fanning wrote:
> chris writes:
>
>

>
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OK. Thanks. If I print the result of the map_proj_init() and look at some of the !MAP fields, the array in P (whatever that is) appears to have the semi-major and semi-minor ellipse axes for WGS 84 in the first two values. (Officially the help menu lists P as: "A 16-element, double-precision floating point array indicating additional projection parameters"). Not too helpful. Whether IDL actually uses these additional parameters for anything, I don't know. When I ran it I was surprised that it didn't give me an error and tell me I couldn't use that ellipse. Maybe it stores those ellipse numbers in that field but doesn't do anything with them, I don't know.

I'll try to actually get the mapping to work with a sphere tomorrow, hopefully I can figure that out.