Subject: Re: problems converting to Cylindrical (longitude-latitude)
Posted by Chris[2] on Mon, 07 Feb 2005 21:48:30 GMT
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Hi Jeff,

MAP_PROJ_IMAGE is used to convert from either lon/lat coordinates to a map projection (U/V coordinates), or from one map projection to another map projection. In either case, the result is always in U/V (Cartesian) coordinates, not in longitude/latitude.

So even though you are converting to the Cylindrical projection, that is still in Cartesian coordinates, hence the huge (but correct) numbers. However, since the Cylindrical projection is just a simple scaling from lon/lat to U/V, you can convert back to lon/lat by just dividing by the Earth radius. Here is your program, modified to convert back to lon/lat at the end. I also put in some gratuitous iMap calls, for those running IDL6.1.

-Chris
Research Systems, Inc.

```
; Data are in Albers Equal-Area; output is to be Cylindrical.
; Albers projection parameters
spar1 = 20
spar2 = 60
clon = -103
clat = 45
; Corners of images (in meters) as stated in metadata.
xmin = -1567000.0
xmax = 277000.0
ymin = -1760000.0
ymax = 694000.0
xyrange = [xmin, ymin, xmax, ymax]

; Compute !MAP structure for each projection.
mapIn = map_proj_init('Albers Equal Area', datum='Clarke 1866', $
                  standard_par1=spar1, standard_par2=spar2, $
                  center_longitude=clon, center_latitude=clat)
mapOut = map_proj_init('Cylindrical', datum='Sphere')

; Input image is imgIn. Compute output image.
imgIn = dist(100)
imgOut = map_proj_image(imgIn, xyrange, image_structure=mapIn, $
              map_structure=mapOut, uvrange=uvRange)

print, 'U range=', uvRange[[0,2]]
print, 'V range=', uvRange[[1,3]]
```

```
; To convert to lon/lat, divide by Earth radius.
print, 'lon range=', uvRange[[0,2]]/6370997*(180/!PI)
print, 'lat range=', uvRange[[1,3]]/6370997*(180/!PI)


; Keep the first image in Albers projection.
iMap, imgIn, GRID_UNITS=1, $ ; meters
   IMAGE_DIMENSIONS=[xmax-xmin, ymax-ymin], $
   IMAGE_LOCATION=[xmin, ymin], $
   MAP_PROJECTION='Albers Equal Area', datum='Clarke 1866', $
   standard_par1=spar1, standard_par2=spar2, $
   center_longitude=clon, center_latitude=clat, $
   LIMIT=[10, -130, 60, -70], $
   VIEW_GRID=[2, 1]

it = ITGETCURRENT(TOOL=oTool)
void = oTool->DoAction('Operations/Insert/Map/Continents')

iMap, imgIn, GRID_UNITS=1, $ ; meters
   IMAGE_DIMENSIONS=[xmax-xmin, ymax-ymin], $
   IMAGE_LOCATION=[xmin, ymin], $
   MAP_PROJECTION='Albers Equal Area', datum='Clarke 1866', $
   standard_par1=spar1, standard_par2=spar2, $
   center_longitude=clon, center_latitude=clat, $
   LIMIT=[20, -130, 60, -70], $
   /VIEW_NEXT

void = oTool->DoAction('Operations/Insert/Map/Continents')

; Warp second image from Albers to Cylindrical.
oMap = oTool->GetByIdentifier('Operations/Operations/Map Projection')
oMap->SetProperty, SHOW_EXECUTION_UI=0, $
   MAP_PROJECTION='Equirectangular', $  ; same as cylindrical
   DATUM='Sphere'
void = oTool->DoAction('Operations/Operations/Map Projection')
oMap->SetProperty, SHOW_EXECUTION_UI=1

end
```

"Jeff DLB" <jeffdlb@erols.com> wrote in message
news:1107788794.384267.35840@z14g2000cwz.googlegroups.com...
> I'm having trouble converting images to Cylindrical (longitude-
> latitude) coordinates. My input data are in Albers Equal-Area
> and cover the western US. When I convert to lon-lat coordinates
> I get output images and bounds that are clearly wrong. I must be
> misusing MAP_PROJ_INIT and MAP_PROJ_IMAGE, but am not sure how.
> Any suggestions would be welcome.

```
>
>  Here's what I have tried:
>
>  ; Data are in Albers Equal-Area; output is to be Cylindrical.
>  ; Albers projection parameters
>  spar1 = 20
>  spar2 = 60
>  clon = -103
>  clat = 45
>  ; Corners of images (in meters) as stated in metadata.
>  xmin = -1567000.0
>  xmax = 277000.0
>  ymin = -1760000.0
>  ymax = 694000.0
>  xyrange = [xmin, ymin, xmax, ymax]
>
>  ; Compute !MAP structure for each projection.
>  mapIn = map_proj_init('Albers Equal Area', datum='Clarke 1866', $
>                        standard_par1=spar1, standard_par2=spar2, $
>                        center_longitude=clon, center_latitude=clat)
>  mapOut = map_proj_init('Cylindrical', datum='Sphere')
>
>  ; Input image is imgIn. Compute output image.
>  imgOut = map_proj_image(imgIn, xyrange, image_structure=mapIn, $
>                  map_structure=mapOut, uvrange=latLonRange)
>  print, lonLatRange
>    -14014183.       3207349.0      -10991525.       5658023.0
>
>
>  The resulting UVRANGE values are clearly not within +/-360 E-W, +/-180
>  N-S.
>  The image metadata states the lon-lat bounds are
>     lower left lat    28.8444, lon  -119.7528
>     upper left lat    49.2565, lon  -126.0326
>     upper right lat    50.8321, lon   -98.8492
>     lower right lat    30.0061, lon  -100.0084
>
>  Thanks for any suggestions,
>  Jeff DLB
>  Reprojection newbie
>
```

Subject: Re: problems converting to Cylindrical (longitude-latitude)
Posted by Jeff DLB on Tue, 08 Feb 2005 20:37:15 GMT
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Chris Torrence wrote:

> However, since the Cylindrical projection is just a simple scaling
from
> lon/lat to U/V, you can convert back to lon/lat by just dividing by
the
> Earth radius.

Thank you for the information! The mention of lat/lon in MAP_PROJ_IMAGE and Chapter 19 - Map Projections suggested degrees would be the output units. I should have realized I was getting arclength rather than angle.

Regards,
Jeff DLB

Subject: Re: problems converting to Cylindrical (longitude-latitude)
Posted by sri_sri on Mon, 28 Feb 2005 03:12:05 GMT
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I tried to run the code sent by Chris and it is giving me this error
imgOut = map_proj_image(imgIn,xyrange, image_structure=mapIn, $

% Syntax error.
At: F:\sur\test_proj.pro, Line 22
% 1 Compilation error(s) in module $MAIN$.

it is showing the error at xyrange.
I am using IDL 6.0.1 on win 2000
Any help would be highly appreciated.I am trying to project UTM data to SOM using the same procedure.

Thanks,
Sri
