Subject: shapefile not in lat/lon
Posted by natha on Thu, 28 Nov 2013 15:59:03 GMT
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Hi gurus,

I have a set of shapefiles defining some regions but the content is not in lat/lon coordinates. I guess I should use the projection defined in the prj file but I don't exactly know how to do it.
I am hoping for some help here.

This is the content of the prj file:
PROJCS["NAD_1983_MTM_8",GEOGCS["GCS_North_American_1983",DATUM[
"D_North_American_1983", SPHEROID["GRS_1980",6378137.0,298.257222101]],
PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION[
"Transverse_Mercator"], PARAMETER["False_Easting",304800.0],PARAMETER["False_Northing
",0.0], PARAMETER["Central_Meridian",-73.5],PARAMETER["Scale_Factor ",0.9999],
PARAMETER["Latitude_Of_Origin",0.0],UNIT["Meter",1.0]]

Using this information how could I get the lat/lon values of the area defined as:

xx=[314000.00,314000.00,315000.00,315000.00,314000.00]
yy=[4987000.0,4988000.0,4988000.0,4987000.0,4987000.0]

Thank you very much in advance,
nata

Subject: Re: shapefile not in lat/lon
Posted by David Fanning on Thu, 28 Nov 2013 16:22:48 GMT
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nata writes:

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"Transverse_Mercator"], PARAMETER["False_Easting",304800.0],PARAMETER["False_Northing
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PARAMETER["Latitude_Of_Origin",0.0],UNIT["Meter",1.0]]
>
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>
> xx=[314000.00,314000.00,315000.00,315000.00,314000.00]

> yy=[4987000.0,4988000.0,4988000.0,4987000.0,4987000.0]

I would set it up like this:

```
map = cgMap('UTM', Ellipsoid='GRS 1980', CENTER_LONGITUDE=-73.5, $
   CENTER_LATITUDE=0, FALSE_EASTING=304800.0)

lonlat = map -> Inverse(xx, yy)
lon = Reform(lonlat[0,*])
lat = Reform(lonlat[1,*])
```

If you use the Shapefile tools in the Coyote Library it won't matter much whether your shapefile uses lat/lon values or projected meter values, as this one does.

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: shapefile not in lat/lon
Posted by natha on Thu, 28 Nov 2013 16:26:56 GMT
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Ah! Thank you David, I am using your routines and now I just realized that the keyword projected_xy takes care of this...
Thank you,
nata

Subject: Re: shapefile not in lat/lon
Posted by natha on Thu, 28 Nov 2013 16:50:11 GMT
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No, it is not working or I don't know how to do it... The only thing I want is my shapefile over a map.
This is what I am doing:

```
 cgdisplay, 800, 700, wid=1
 map = cgMap('UTM', Ellipsoid='GRS 1980', CENTER_LONGITUDE=-73.5, $
  CENTER_LATITUDE=0, FALSE_EASTING=304800.0, LIMIT=[44,-75.25,47,-72.5])
```

```
cgmap_grid,  /box_axes, map_structure=map
cgmap_continents, /continents, /coasts, /usa, /rivers, /countries, /hires, map_str=map
cgdrawshapes, shapefile, mapcoord=map, /projected_xy
```

Subject: Re: shapefile not in lat/lon
Posted by David Fanning on Thu, 28 Nov 2013 16:57:27 GMT
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nata writes:

>
> No, it is not working or I don't know how to do it... The only thing I want is my shapefile over a map.
> This is what I am doing:
>
> cgdisplay, 800, 700, wid=1
> map = cgMap('UTM', Ellipsoid='GRS 1980', CENTER_LONGITUDE=-73.5, $
> CENTER_LATITUDE=0, FALSE_EASTING=304800.0, LIMIT=[44,-75.25,47,-72.5])
> cgmap_grid, /box_axes, map_structure=map
> cgmap_continents, /continents, /coasts, /usa, /rivers, /countries, /hires, map_str=map
> cgdrawshapes, shapefile, mapcoord=map, /projected_xy

I'm just going out to gather some company for Thanksgiving, but package
all the pieces of the shapefile up in a zip file and send it to me. I'll
have a look when I get the chance. (Good excape from the family!)

But, instead of doing this:

> cgdrawshapes, shapefile, mapcoord=map, /projected_xy

I would try this:

```
map -> SetProperty, Position=[0.1, 0.1, 0.9, 0.9]
map -> Draw
cgmap_continents, /continents, /coasts, /usa, /rivers, $
  /countries, /hires, map_str=map
cgmap_grid,  /box_axes, map_structure=map
cgDrawshapes, shapefile
```

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: shapefile not in lat/lon
Posted by David Fanning on Fri, 29 Nov 2013 16:17:02 GMT
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nata writes:

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> xx=[314000.00,314000.00,315000.00,315000.00,314000.00]
> yy=[4987000.0,4988000.0,4988000.0,4987000.0,4987000.0]

Nata sent me this file, and I was *finally* able to figure out what is going on. This file is a Modified UTM projection used in Eastern Canada. It's zone (zone 8 in this case) is only 3 degrees wide, rather than the usual 6 degrees wide. Initially, I tried to use a UTM map projection with the equivalent zone number (18 in this case), but the resulting shape was just a little bit out of place.

I fooled around with the UTM projection for quite some time, and then I realized that whatever value I was using for FALSE_EASTING (304800.0 in this case) made absolutely no difference when I converted the projected XY values in the shapefile to latitude and longitude. This turns out to be because the UTM projection is *assuming* the usually 5000000.0 false easting value for this projection. It ignores whatever you use with the FALSE_EASTING keyword!

This was the clue I needed to realize I needed to change the map projection. I chose a Transverse Mercator projection, with the proper FALSE_EASTING value, and suddenly all appeared well! This also had the advantage that I could use more of the information from the file. For example, now the CENTER_LONGITUDE and MERCATOR_SCALE values made sense!

```
   utmmap = cgMap('Transverse Mercator', Ellipsoid='GRS 1980', $
```

```
    MERCATOR_SCALE=0.9999, FALSE_EASTING=304800., $
    CENTER_LONGITUDE=-73.5)
```

I wanted to put this on a Google map so I could make sure it was located correctly, so then it was simply a matter of converting these Transverse Mercator coordinates, using the GRS 1980 datum, into the Google Mercator coordinates, with the WGS84 datum, of the Google map:

```
roi = cgExtractShape(shapefile, 'LAYER', 'RICHELIEU')
roi -> GetProperty, DATA=xy
ll = Map_Proj_Inverse(xy[0,*], xy[1,*], MAP=utmmap->GetMapStruct())
xy = Map_Proj_Forward(ll[0,*], ll[1,*], MAP=googlemap->GetMapStruct())
roi -> SetProperty, DATA=xy
cgDraw_ROI, roi, /Outline, Color='red', Thick=4
```

Wahla! Perfect. :-)

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: Transparent Polygon Shapes Displayed on a Map
Posted by David Fanning on Sun, 01 Dec 2013 19:18:01 GMT
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David Fanning writes:

> I wanted to put this on a Google map so I could make sure it was located
> correctly, so then it was simply a matter of converting these Transverse
> Mercator coordinates, using the GRS 1980 datum, into the Google Mercator
> coordinates, with the WGS84 datum, of the Google map:
>
> roi = cgExtractShape(shapefile, 'LAYER', 'RICHELIEU')
> roi -> GetProperty, DATA=xy
> ll = Map_Proj_Inverse(xy[0,*], xy[1,*], MAP=utmmap->GetMapStruct())
> xy = Map_Proj_Forward(ll[0,*], ll[1,*], MAP=googlemap->GetMapStruct())
> roi -> SetProperty, DATA=xy
> cgDraw_ROI, roi, /Outline, Color='red', Thick=4
>
> Wahla! Perfect. :-)

I learned a lot (and had to update some software!) from this experience.

You can find an article about how I went about displaying a transparent polygon shape from a shapefile on a map in this article:

http://www.idlcoyote.com/map_tips/transpoly.php

I spent about 15 hours of my time over the past four days figuring this out and writing an article about it. No one pays me to do this. I do it because I like to. In the last 10 years I have probably put in 20 hours a week supporting IDL users here, through e-mail, and on my web page at no charge to anyone. But, this kind of support for IDL users will be coming to an end by the end of this year unless I can find some way to keep doing it.

If this matters to you, if you use the Coyote Library, if you appreciate the articles on this web page, if I have answered your questions though e-mail, then I encourage you to take a moment and show your support by making a donation to this work. I am coming to the reluctant conclusion that what I do with IDL has no economic value. If this is true, then I have to find something else to do, and quickly.

A donation in whatever amount you can afford and consider reasonable will be gratefully appreciated. I love to do this work. It really is the only thing I have ever wanted to do. I hope it is valuable to you, too. You can make a donation here if you wish to do so:

http://www.idlcoyote.com/coyotestore/index.php?main_page=ind ex&cPath=67

Cheers,

David
--
David Fanning, Ph.D.
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