Subject: Add GSHHS coastline on georeferenced image layers retrieved from MODIS HDF file?
Posted by Harry Kim on Fri, 25 Jun 2010 08:55:53 GMT
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Hi, all. I would like to add the coastline on my solar zenith angle (SOLZA) image layers on Korean Peninsula retrieved from MODIS 07 atmospheric profile product. These images were georeferenced on the basis of the information in the geolocation fields (data set # 0 and 1, latitude and longitude, respectively) of MODIS 07 HDF file. In order to add the high resolution coastline, I downloaded Map_GSHHS_shoreline (David Fanning, 2008).

However, at least in my understanding so far, Map_GSHHS_shoreline seems to draw a coastline on a blank window, and I have no idea how to link this procedure to the classical MODIS image-processing method. Please take a look at my sourcecode and give me any suggestions, especially section 3.2.

I know that someone in this forum may not like the idea to post a full source code here. I am sorry if I am bothering him, but I hope this humble source code can help others to begin MODIS data processing in near future.

Thank you very much in dvance.

```
PRO MOD07_MakeImage_solza_062310 ; Ta, Td, Solza only

;******************************************************** **************
;********       1.  Preprocessing.
*********
;******************************************************** **************

; 1.1. Designate paths of workspace and output image folders.
WorkSp07 = 'E:\MODIS07\MOD07_Workspace\'
WorkSpOut07 = 'E:\MODIS07\Image_output\'
batch_st07 = strcompress(WorkSp07+'List_MOD07.txt',/remove_all)
WorkSpHDF = 'E:\MODIS07\MOD07\'

numDates = file_lines(batch_st07)
Dates    = StrArr(numDates)

; 1.2. Read input dates from batch file
OpenR, lun, batch_st07, /Get_lun
```

```
ReadF, lun, Dates
Free_Lun, lun, /force

FOR j = 0, numDates-1 DO BEGIN
;FOR j = 0, 50 DO BEGIN

s_time = systime(1)

   print, "Now processing MOD07 data from date: ", Dates[j], '
File ', j+1, ' out of ', numDates

; 1.3. Open HDF files.

   HDFname     = WorkSpHDF+Dates[j]

   FileOpen         = HDF_OPEN(HDFname, /Read)
   sdFileID         = HDF_SD_Start(HDFname, /Read)
   sdsID_lat        = HDF_SD_Select(sdFileID, 0)
   sdsID_lon        = HDF_SD_Select(sdFileID, 1)
   sdsID_SOLZA  = HDF_SD_Select(sdFileID, 3)

   hdf_sd_getdata, sdsID_lat, lat
   hdf_sd_getdata, sdsID_lon, lon
   hdf_sd_getdata, sdsID_lon, SOLZA_temp

   ENVI_WRITE_ENVI_FILE, lat, out_name='lat_temp.img'
   ENVI_WRITE_ENVI_FILE, lon, out_name='lon_temp.img'

   envi_open_file, 'lat_temp.img', r_fid=lat_fid
   envi_open_file, 'lon_temp.img', r_fid=lon_fid
   envi_file_query, lat_fid, ns=ns, nl=nl, nb=nb
   dims   = [-1, 0, ns-1, 0, nl-1]
   pos    = lindgen(nb)

 ;************************************************************ **************
;** 2. CONSTRUCTING GLT FILE FOR  GEOREFERENCING  **
 ;************************************************************ **************
; 2.1. Designate datum and projection name.

DATUM          = 'Tokyo mean'
Projection_Name = 'Korea - TM (Middle)'
Params = [6377397.2, 6356079.0, 38.000000, 127.002890, 200000.0,
500000.0, 1.000000]

   IN_proj    = ENVI_PROJ_CREATE(/Geographic)
   OUT_Proj   = ENVI_PROJ_CREATE(type=3, name=Projection_Name,
datum=Datum, params=Params)
```

```
;2.2. Building GLT file for georeferencing
   ENVI_DOIT, 'ENVI_GLT_DOIT', DIMS=dims, I_PROJ=IN_proj,
O_PROJ=OUT_proj, R_FID=GLT_fid,$
                        ROTATION=0, X_FID=lon_fid,
X_POS=pos[0], Y_FID=lat_fid, Y_POS=pos[0], out_name='GLT.img'

;2.3. Scale HDF data to physical values
SOLZA    =   CONV_PHYSICAL(sdsID_SOLZA, SOLZA_temp)    ; SOLAR zenith
angle [degrees]

 ;************************************************************ **************
;**  3. Add Korea TM coordinates on georeferenced files *********
 ;************************************************************ **************

;3.1. Printout these arrays on image files.

   StrDate   = STRMID(Dates[j], 10,7)
   StrFile   = STRMID(Dates[j], 10, 12)
   StrTime   = STRMID(Dates[j], 18, 4)
   StrSat    = STRMID(Dates[j], 0, 5)

   ENVI_WRITE_ENVI_FILE, SOLZA, out_name='SOLZA_temp.img'
   envi_open_file, 'SOLZA_temp.img', r_fid=SOLZA_fid
   envi_file_query, SOLZA_fid, ns=ns, nl=nl, nb=nb
   pos = lindgen(nb)

   out_name_SOLZA = WorkSpOut07+StrSat+'/'+StrDate+'/'+StrSat+StrFile
+'_SOLZA0_5km'+'.img'
   ENVI_DOIT, 'ENVI_GEOREF_FROM_GLT_DOIT', FID=SOLZA_fid,
GLT_FID=GLT_fid, POS=pos, R_fid=SOLZA_G_fid, out_name=out_name_SOLZA

; 3.2. Add coast lines for Korean penninsular. - not yet
completed...!!!
       Set_plot, 'z'
       datafile = 'C:\Program Files\ITT\IDL708\lib
\GSHHS_2.0\gshhs_h.b'
       Device, set_resolution = [500, 350]
       pos = [0.1,0.1, 0.9, 0.8]
       Map_Set, 37.0, 127.0, Position=pos, Scale=15e6, /Mercator, /
NoBorder
       Polyfill, [pos[0], pos[0], pos[2], pos[2], pos[0]], $
              [pos[1], pos[3], pos[3], pos[1], pos[1]], $
              /Normal, Color=FSC_Color('Almond')
       Map_GSHHS_Shoreline, datafile, Level=3, /Outline
       b = tvrd()
       write_jpeg, 'test09.jpg', b

 ;************************************************************ **************
```

```
;******       4. Finish up the image processing
*************
 ;********************************************************** **************

; 4.1. Clean memories.

   NextHdf:

   ENVI_FILE_MNG, ID=lat_fid, /remove          ;, /Delete
   ENVI_FILE_MNG, ID=lon_fid, /remove          ;, /Delete
   ENVI_FILE_MNG, ID=SOLZA_G_fid, /remove

   NextHdf_2:

; 4.2.  Done with SDS, close the interface

       HDF_SD_ENDACCESS,SdsID_LAT
       HDF_SD_ENDACCESS,SdsID_LON
       HDF_SD_ENDACCESS,SdsID_SOLZA
       HDF_SD_END,sdFileID
       HDF_CLOSE,FileOpen

   Close, /all, /force

ENDFOR

e_time = systime(1)

print, "It's done!!! Elapsed time for this procedure:   ", e_time -
s_time

close, /all

END
```

Subject: Re: Add GSHHS coastline on georeferenced image layers retrieved from MODIS HDF file?
Posted by David Fanning on Mon, 28 Jun 2010 00:55:51 GMT
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Harry Kim writes:

> "I guess what I am saying is, even if you could figure out how to make
> a vector layer from the GSHHS data, I'm not sure you
> are going to be happy with the result. It just seems to me that this
> is one of those few things that ENVI is not very good at."
>

> Would you let me know how to do this please?

If I knew how to do that, I would have probably
written an article about it already. :-(

You will have to ask someone who knows more about ENVI
than I do. Sorry.

Cheers,

David

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

Subject: Re: Add GSHHS coastline on georeferenced image layers retrieved from MODIS HDF file?
Posted by Harry Kim on Tue, 29 Jun 2010 09:36:12 GMT
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Mmmm... I am really sorry to hear that. (T.T) However, I did not give
this up, and I found an alternative in Envi main menu.

1) Open my image and go to the ENVI main menu. -> Vector -> Create
world boundaries -> check [2] Coastlilnes (High Res)

2) Bounding Lat/Lon Coordinates . In my case.
Lat min: 30; Lat max: 50
Lon min: 120; Lon max: 140

3) Output results to File
Enter output root Filename : Test001 -> then click OK.

Then available vector layer is shown on the table.

4) Then click 'Load Selected' and choose the image that I opend in 1)
(In this case, display #1)
Now I got the coastline in my image.

5) save using write_jpeg.

However, I cannot do this manually since I have to do this over 1700

images per year from 2000 to 2009. I have to complete this through
programming.
Can you give me any suggestions? Thanks, in advance.

Harry

Subject: Re: Add GSHHS coastline on georeferenced image layers retrieved from MODIS HDF file?
Posted by d.poreh on Tue, 29 Jun 2010 10:21:18 GMT
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On Jun 29, 2:36 am, Harry Kim <kim4ecohy...@gmail.com> wrote:
> Mmmm... I am really sorry to hear that. (T.T) However, I did not give
> this up, and I found an alternative in Envi main menu.
>
> 1) Open my image and go to the ENVI main menu. -> Vector -> Create
> world boundaries -> check [2] Coastlilnes (High Res)
>
> 2) Bounding Lat/Lon Coordinates . In my case.
> Lat min: 30; Lat max: 50
> Lon min: 120; Lon max: 140
>
> 3) Output results to File
> Enter output root Filename : Test001 -> then click OK.
>
> Then available vector layer is shown on the table.
>
> 4) Then click 'Load Selected' and choose the image that I opend in 1)
> (In this case, display #1)
> Now I got the coastline in my image.
>
> 5) save using write_jpeg.
>
> However, I cannot do this manually since I have to do this over 1700
> images per year from 2000 to 2009. I have to complete this through
> programming.
> Can you give me any suggestions? Thanks, in advance.
>
> Harry
How about to save data as vector file like *.SHP file and just load
that every time?
D.

Subject: Re: Add GSHHS coastline on georeferenced image layers retrieved from MODIS HDF file?

Posted by Harry Kim on Wed, 30 Jun 2010 05:34:00 GMT
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Thanks, Dave. That must be the most efficient alternative in my case.
Would you let me know how to do that in programming way in IDL?

*.SHP file or *.evf will be OK, maybe.

Harry

Subject: Re: Add GSHHS coastline on georeferenced image layers retrieved from MODIS HDF file?
Posted by d.poreh on Wed, 30 Jun 2010 10:17:05 GMT
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On Jun 29, 10:34 pm, Harry Kim <kim4ecohy...@gmail.com> wrote:
> Thanks, Dave. That must be the most efficient alternative in my case.
> Would you let me know how to do that in programming way in IDL?
>
> *.SHP file or *.evf will be OK, maybe.
>
> Harry

Help> Overview of ESRI Shape files. There are some examples show how
to read shape file to IDL and after reading the identities you can
easily over plot on your data.
Cheers
Dave