## Subject: Best routines for mapping satellite images Posted by Steve Super on Mon, 25 Aug 2014 19:13:01 GMT

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Does anyone have any suggestions for which routines are best for projecting satellite images? I have an un-projected image array, along with associated lat/lon arrays that I would like to map and then add some other layers/annotations.

I have tried many different approaches (i.e., old IDL procedures, new IDL graphics functions, CG) with varying, but insufficient results.

Thanks, Steve

Subject: Re: Best routines for mapping satellite images
Posted by chris\_torrence@NOSPAM on Mon, 25 Aug 2014 23:15:37 GMT
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On Monday, August 25, 2014 1:13:01 PM UTC-6, Steve Super wrote:

> Does anyone have any suggestions for which routines are best for projecting satellite images? I have an un-projected image array, along with associated lat/lon arrays that I would like to map and then add some other layers/annotations.

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 >
 Thanks,

> Steve

> >

I think it depends upon what you are trying to achieve. You could take the quick approach, and use IDL function graphics and see if that is what you want:

Assuming that your image coordinates are in "degrees" (since you said unprojected):

```
m = MAP( "Mollweide", LIMIT=[latmin, lonmin, latmax, lonmax] )
im = IMAGE(mydata, IMAGE_LOCATION=[lon0, lat0], $
    IMAGE_DIMENSIONS=[widthLon, heightLat], $
    GRID_UNITS="degrees", /OVERPLOT)
c = MAPCONTINENTS()
m.Save, "map.pdf"
```

You will need to fill in appropriate values for latmin, etc.

Hope this helps.
-Chris
ExelisVIS

Subject: Re: Best routines for mapping satellite images Posted by Chris Anderson on Wed, 27 Aug 2014 01:14:27 GMT View Forum Message <> Reply to Message

On Monday, August 25, 2014 12:13:01 PM UTC-7, Steve Super wrote:

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>

> I have tried many different approaches (i.e., old IDL procedures, new IDL graphics functions, CG) with varying, but insufficient results.

> >

> Thanks,

>

> Steve

What are the lat/lon arrays you have? Are the extent of the iage? Or are they the location for each element in your un-projected image array?

Subject: Re: Best routines for mapping satellite images Posted by Phillip Bitzer on Wed, 27 Aug 2014 13:27:00 GMT View Forum Message <> Reply to Message

I'll add some more questions:

Are the lat/lons equally spaced? Of the different approaches, what did you like? What was insufficient?

Subject: Re: Best routines for mapping satellite images Posted by Steve Super on Wed, 29 Oct 2014 21:08:25 GMT View Forum Message <> Reply to Message

On Monday, August 25, 2014 3:13:01 PM UTC-4, Steve Super wrote:

> Does anyone have any suggestions for which routines are best for projecting satellite images? I have an un-projected image array, along with associated lat/lon arrays that I would like to map and then add some other layers/annotations.

> I have tried many different approaches (i.e., old IDL procedures, new IDL graphics functions, CG) with varying, but insufficient results.

- > Thanks.
- > Steve

Sorry I missed all these replies, I put this problem aside for while and forgot to check back.

To answer some of the questions:

- -Yes the coordinates are in degrees and are not evenly spaced (non-gridded data).
- -The lat/lon arrays have the same dimensions as the image data.

The data I am working with is NPP VIIRS M-band data, which I am attempting to use to create a true-color image. My desired outcome is to have a warped image that retains the original dimensions of the data. I want to then focus on a subset of the image and highlight pixels of interest, as well as plot the path of CALIPSO overpass, which is based on lat/lon as well.

So far the closest I have come to what I believe is a good result was done using the 'map\_set' and 'map patch' procedures. However, in this case boundaries and coastlines do not quite match up, and there is no way to specify that the image dimensions remain the same as the input array.

Thanks for the comments and help.

-Steve

>

>

>

Subject: Re: Best routines for mapping satellite images Posted by David Fanning on Wed, 29 Oct 2014 21:45:12 GMT

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## Steve Super writes:

- > Sorry I missed all these replies, I put this problem aside for while and forgot to check back.
- > To answer some of the questions:

-Yes the coordinates are in degrees and are not evenly spaced (non-gridded data).

- > -The lat/lon arrays have the same dimensions as the image data.
- > The data I am working with is NPP VIIRS M-band data, which I am attempting to use to create a true-color image. My desired outcome is to have a warped image that retains the original dimensions of the data. I want to then focus on a subset of the image and highlight pixels of interest, as well as plot the path of CALIPSO overpass, which is based on lat/lon as well.
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>

> Thanks for the comments and help.

I've had reasonably good luck using cgWarpToMap using data like this. It uses either GridData or Interpolation (much faster!) to grid the data, depending upon the input data.

http://www.idlcoyote.com/idldoc/cg/cgwarptomap.html http://www.idlcoyote.com/code\_tips/usegriddata.html http://www.idlcoyote.com/code\_tips/griddata.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: Best routines for mapping satellite images Posted by Steve Super on Thu, 30 Oct 2014 14:07:02 GMT View Forum Message <> Reply to Message

On Wednesday, October 29, 2014 5:45:19 PM UTC-4, David Fanning wrote:

> Steve Super writes:

>

>> Sorry I missed all these replies, I put this problem aside for while and forgot to check back.

>>

>> To answer some of the questions:

>>

- >> -Yes the coordinates are in degrees and are not evenly spaced (non-gridded data).
- >> -The lat/lon arrays have the same dimensions as the image data.

>>

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- > http://www.idlcoyote.com/code\_tips/usegriddata.html
- > http://www.idlcoyote.com/code\_tips/griddata.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.")

David,

Thanks for the reply. I have attempted to use cgWarptoMap previously, but while the dimensions are the same as the original image, for some reason the result is a zeroed array.

Subject: Re: Best routines for mapping satellite images Posted by David Fanning on Thu, 30 Oct 2014 14:16:29 GMT

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Steve Super writes:

> Thanks for the reply. I have attempted to use cgWarptoMap previously, but while the dimensions are the same as the original image, for some reason the result is a zeroed array.

Ah, well, you must be doing something wrong. ;-)

Any missing data in those arrays?

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: Best routines for mapping satellite images

## Posted by Steve Super on Thu, 30 Oct 2014 14:45:07 GMT

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On Thursday, October 30, 2014 10:16:36 AM UTC-4, David Fanning wrote:

> Steve Super writes:

>

- >> Thanks for the reply. I have attempted to use cgWarptoMap previously, but while the dimensions are the same as the original image, for some reason the result is a zeroed array.
- > Ah, well, you must be doing something wrong. :-)

>

Any missing data in those arrays? >

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.")

There is missing data in the data arrays which I initially set to 'NAN', however I replaced those values (set to 0) before attempting to warp the image which gives the same result. The lat/lon arrays have no missing values.

Subject: Re: Best routines for mapping satellite images Posted by Liam E. Gumley on Thu, 30 Oct 2014 16:20:41 GMT View Forum Message <> Reply to Message

On Wednesday, October 29, 2014 4:08:27 PM UTC-5, Steve Super wrote:

- > On Monday, August 25, 2014 3:13:01 PM UTC-4, Steve Super wrote:
- >> Does anyone have any suggestions for which routines are best for projecting satellite images? I have an un-projected image array, along with associated lat/lon arrays that I would like to map and then add some other layers/annotations.

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>> I have tried many different approaches (i.e., old IDL procedures, new IDL graphics functions, CG) with varying, but insufficient results.

>>

- >> Thanks.
- >> Steve

Sorry I missed all these replies, I put this problem aside for while and forgot to check back.

> > To answer some of the questions:

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- > Thanks for the comments and help.
- > -Steve

Steve,

The POLAR2GRID package will ingest VIIRS M-band SDR HDF5 files (image and geolocation) and create high quality true color images in GeoTIFF format. Several different map projections are available, including Google Earth. Once you have the imagery in GeoTIFF format, it should be straightforward to load and georeference the image in IDL. POLAR2GRID provides similar features for MODIS Level 1B HDF4 files.

POLAR2GRID is freely available here:

http://cimss.ssec.wisc.edu/cspp/npp\_polar2grid\_v1.2.shtml

You will need a 64-bit Linux system to run the software.

Cheers, Liam. Practical IDL Programming http://www.gumley.com/

Subject: Re: Best routines for mapping satellite images Posted by David Fanning on Thu, 30 Oct 2014 17:52:27 GMT

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Steve Super writes:

> There is missing data in the data arrays which I initially set to 'NAN', however I replaced those values (set to 0) before attempting to warp the image which gives the same result. The lat/lon arrays have no missing values.

Well, happy to have a look if you send me your data.

Dave

--

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Sepore ma de ni thue. ("Perhaps thou speakest truth.")

Subject: Re: Best routines for mapping satellite images Posted by Steve Super on Thu, 30 Oct 2014 18:40:24 GMT

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On Thursday, October 30, 2014 12:20:44 PM UTC-4, liam....@ssec.wisc.edu wrote:

- > On Wednesday, October 29, 2014 4:08:27 PM UTC-5, Steve Super wrote:
- >> On Monday, August 25, 2014 3:13:01 PM UTC-4, Steve Super wrote:
- >>> Does anyone have any suggestions for which routines are best for projecting satellite images? I have an un-projected image array, along with associated lat/lon arrays that I would like to map and then add some other layers/annotations.

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- >>> Steve

>>

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- -

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> You will need a 64-bit Linux system to run the software.

>

> Cheers,

> Liam.

- > Practical IDL Programming
- > http://www.gumley.com/

Thanks Liam, I downloaded the software and gave it a shot. I was able to create reprojected images without any trouble, however when I tried to use the crefl2gtiff script for creating a True Color GeoTIFF file I received the following errors:

"Cannot read fill value of SDS "Reflectance\_Mod\_M5".

SDS "Reflectance Mod M5": 3200x768 scale factor: 2.44174e-05 offset: 0

Cannot find SDS Reflectance Mod M7 in file NPP VMAE L1.hdf.

band 2

Cannot read fill value of SDS "Reflectance Mod M3".

SDS "Reflectance\_Mod\_M3": 3200x768 scale factor: 2.44174e-05 offset: 0

band 3

Cannot read fill value of SDS "Reflectance\_Mod\_M4".

SDS "Reflectance\_Mod\_M4": 3200x768 scale factor: 2.44174e-05 offset: 0

Cannot find SDS Reflectance\_Mod\_M8 in file NPP\_VMAE\_L1.hdf.

Cannot find SDS Reflectance Mod M10 in file NPP VMAE L1.hdf.

Cannot find SDS Reflectance Mod M11 in file NPP VMAE L1.hdf.

band 16

Cannot read fill value of SDS "SolZenAng Mod".

SDS "SolZenAng Mod": 3200x768 scale factor: 1 offset: 0

band 17

Cannot read fill value of SDS "SenZenAng\_Mod".

SDS "SenZenAng\_Mod": 3200x768 scale factor: 1 offset: 0

band 18

Cannot read fill value of SDS "SolAziAng\_Mod".

SDS "SolAziAng Mod": 3200x768 scale factor: 1 offset: 0

band 19

Cannot read fill value of SDS "SenAziAng Mod".

SDS "SenAziAng Mod": 3200x768 scale factor: 1 offset: 0

band 20

Cannot read fill value of SDS "Longitude".

SDS "Longitude": 3200x768 scale factor: 1 offset: 0

band 21

Cannot read fill value of SDS "Latitude".

SDS "Latitude": 3200x768 scale factor: 1 offset: 0

Creating SDS CorrRefl 01: 3200x768

(lines 1km x samples 1km) Creating SDS CorrRefl 02: 0x0 Cannot create SDS CorrRefl\_02 Error running VIIRS M-band corrected reflectance on input file NPP\_VMAE\_L1.hdf OOPS: Could not create CREFL output for file /data/home001/stephens/polar2grid/data//SVM05\_npp\_d20130915\_t2038180\_e 2039422 b09768 c20130916030531344011 noaa ops.h5 FAILURE"

I did this by calling the script with the -d flag along with path to the directory containing the 3 matching SVM(band3-5) files and GMTCO geolocation file. Is there something else I'm missing here?

Subject: Re: Best routines for mapping satellite images Posted by Steve Super on Thu, 30 Oct 2014 19:48:57 GMT

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On Thursday, October 30, 2014 1:52:34 PM UTC-4, David Fanning wrote:

> Steve Super writes:

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

Sure Dave, what is the best way to get the data to you?

Subject: Re: Best routines for mapping satellite images Posted by David Fanning on Thu, 30 Oct 2014 19:53:29 GMT View Forum Message <> Reply to Message

Steve Super writes:

> Sure Dave, what is the best way to get the data to you?

Google Drive, Dropbox, FTP site, or e-mail, if its not too big. :-)

Cheers,

David

--

David Fanning, Ph.D.

Fanning Software Consulting, Inc.

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Subject: Re: Best routines for mapping satellite images Posted by devin.april.white on Fri, 31 Oct 2014 13:10:20 GMT

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You could also try the VIIRS Conversion Toolkit: https://github.com/dawhite/VCTK

Subject: Re: Best routines for mapping satellite images Posted by Liam E. Gumley on Fri, 31 Oct 2014 13:48:04 GMT

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On Thursday, October 30, 2014 1:40:26 PM UTC-5, Steve Super wrote:

- > On Thursday, October 30, 2014 12:20:44 PM UTC-4, liam....@ssec.wisc.edu wrote:
- >> On Wednesday, October 29, 2014 4:08:27 PM UTC-5, Steve Super wrote:
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- > band 2
- > Cannot read fill value of SDS "Reflectance\_Mod\_M3".
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- > band 3
- > Cannot read fill value of SDS "Reflectance\_Mod\_M4".
- > SDS "Reflectance Mod M4": 3200x768 scale factor: 2.44174e-05 offset: 0
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- > SDS "SenAziAng\_Mod": 3200x768 scale factor: 1 offset: 0
- > band 20
- > Cannot read fill value of SDS "Longitude".
- > SDS "Longitude": 3200x768 scale factor: 1 offset: 0
- > band 21
- > Cannot read fill value of SDS "Latitude".
- > SDS "Latitude": 3200x768 scale factor: 1 offset: 0
- > Creating SDS CorrRefl\_01: 3200x768
- > (lines\_1km x samples\_1km)
- > Creating SDS CorrReft 02: 0x0
- > Cannot create SDS CorrRefl 02
- > Error running VIIRS M-band corrected reflectance on input file NPP VMAE L1.hdf
- > OOPS: Could not create CREFL output for file

/data/home001/stephens/polar2grid/data//SVM05 npp d20130915 t2038180 e 2039422 b09768 c20130916030531344011 noaa ops.h5

> FAILURE"

>

> I did this by calling the script with the -d flag along with path to the directory containing the 3 matching SVM(band3-5) files and GMTCO geolocation file. Is there something else I'm missing here?

Steve, email me and I'll put you in touch with the developer.

liam.gumley at ssec.wisc.edu