Subject: Re: Overlaying gridded winds on satellite data
Posted by James Kuyper on Wed, 20 Jul 2005 12:44:16 GMT
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Chris wrote:
> Hello all...this maybe a rather simple question...but for some reason I
> am having problems and getting rather frustrated. I am hoping that you
> guys may have an answer for me. I have visible satellite data which is
> in NetCDF format which I can easily get displayed. However, my problem
> is laying gridded wind barbs...which are in 900x900 arrays to print on
> top of the satellite data. Everytime I do it...the latitudes and
> longitudes do not match up correctly...they are close but not correct.
> Does anyone know how I could fix this? Thanks for all the help.

We can't know how to fix it until we know what you're doing. Please
provide a simplified version of your code. Also, you need to explain
how you know that the latitudes and longitudes are not matched up
correctly: what are the symptoms that lead you to this conclusion?

Subject: Re: Overlaying gridded winds on satellite data
Posted by David Fanning on Wed, 20 Jul 2005 13:08:25 GMT
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kuyper@wizard.net writes:

> We can't know how to fix it until we know what you're doing. Please
> provide a simplified version of your code. Also, you need to explain
> how you know that the latitudes and longitudes are not matched up
> correctly: what are the symptoms that lead you to this conclusion?

And, in particular, please tell us how you are setting
up the map projection and how you are either (1) warping
the image to that map projection or (2) aligning the
map projection to that image.

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Overlaying gridded winds on satellite data

Posted by Chris[3] on Wed, 20 Jul 2005 15:45:20 GMT
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My code is attached to this message. The Imagemap procedure is the procedure by Dr. Liam Gumley which displays the satellite data to a window. Reading through the code for that procedure...I see no specific projection...I am imagining it's just the satellite projection. The Windbarb1 procedure was written by David Fanning...which draws the wind barbs. The grid on which the wind barbs are on is a 2 km resolution, so 1800 x 1800 km total, however it uses latitude and longitude for those coordinates. If you guys need any more information in helping me with this...I can certainly give it...thank you for all of your help...it's greatly appreciated.

```
pro barbtest2

;Defining all arrays needed
lat1=fltarr(900,900)
long1=fltarr(900,900)
windspeed=fltarr(900,900)
winddir=fltarr(900,900)
upert=fltarr(900,900)
vpert=fltarr(900,900)

;Opening and reading in latitude and longitude
openr, lun, 'C:\Documents and
Settings\jewett\Desktop\IDL\latitude.dat', /get_lun
readf, lun, lat1
close, lun
openr, lun, 'C:\Documents and
Settings\jewett\Desktop\IDL\longitude.dat', /get_lun
readf, lun, long1
close, lun
openr, lun, 'C:\Documents and
Settings\jewett\Desktop\IDL\1815Sept21\1000_900upert.dat', /get_lun
readf, lun, upert
close, lun
openr, lun, 'C:\Documents and
Settings\jewett\Desktop\IDL\1815Sept21\1000_900vpert.dat', /get_lun
readf, lun, vpert
close, lun

windspeed=sqrt(upert*upert+vpert*vpert)
winddir=-asin(vpert/windspeed)*57.29577951+270
windspeed=windspeed*1.94384449

windspeed1=sqrt(upert1*upert1+vpert1*vpert1)
```

```
winddir1=-asin(vpert1/windspeed1)*57.29577951+270
windspeed1=windspeed1*1.94384449
cdfid=ncdf_open("C:\Documents and
Settings\jewett\Desktop\research\netcdf\NETCDF13.nc")
glob=ncdf_inquire(cdfid)

;Finding the dimensions and variables of the netCDF file
     print, 'Dimensions', glob.ndims
     print, 'variables', glob.nvars
     for i=0, glob.ndims-1 do begin
        ncdf_diminq, cdfid, i, name, size
        if i EQ glob.recdim then $
          print, '    ', name, size, '(Unlimited dim)' $
        else    $
          print, '    ', name, size
     endfor
    print, 'variables'
    for i=0, glob.nvars-1 do begin
       info = ncdf_varinq(cdfid,i)
       FmtStr= '(A,"(",A,") Dimension Ids = [ ", 10(I0," "))'
         print, FORMAT=FmtStr, info.name, info.datatype, info.dim[*]

            for j=0, info.natts-1 do begin
                    attname=ncdf_attname(cdfid,i,j)
                ncdf_attget, cdfid, i, attname, attvalue
                  print, '   Attribute    ', attname, '=',
string(attvalue)
            endfor
    endfor
;Obtaining variables from the netCDF file
    dataid=ncdf_varid(cdfid, 'data')
    ncdf_varget, cdfid, dataid, satellite
    latitude=ncdf_varid(cdfid, 'latitude')
    ncdf_varget, cdfid, latitude, lat
    longitude=ncdf_varid(cdfid, 'longitude')
    ncdf_varget, cdfid, longitude, longitude
    time=ncdf_varid(cdfid, 'imageTime')
    ncdf_varget, cdfid, time, time

;Calling procedure which displays the visible satellite image

    imagemap, satellite, lat, longitude
    map_continents, Color=FSC_Color('Sea Green', !D.Table_Size-3),
/hires

    ;Begin procedure which which draws windbarbs...need longitude,
latitude, windspeed and wind direction
    Windbarb1, long1[0:*:5,0:*:5], lat1[0:*:5,0:*:5],
```

windspeed[0:*:5,0:*:5], winddir[0:*:5,0:*:5], Color='Indian Red';,
clip=clip
end

Subject: Re: Overlaying gridded winds on satellite data
Posted by Chris[3] on Wed, 20 Jul 2005 15:47:32 GMT
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I forgot to mention how I came up with my conclusion that the latitudes
and longitudes do not match up. I used the cursor procedure which I
then print to the screen to tell me the latitude and longitude of
certain pixels...I use the corner to make sure I click on the same
pixel...and the latitudes and longitudes do not match up. Thanks again
for all of your help.

Chris

Subject: Re: Overlaying gridded winds on satellite data
Posted by David Fanning on Wed, 20 Jul 2005 16:14:56 GMT
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Chris writes:

> I forgot to mention how I came up with my conclusion that the latitudes
> and longitudes do not match up. I used the cursor procedure which I
> then print to the screen to tell me the latitude and longitude of
> certain pixels...I use the corner to make sure I click on the same
> pixel...and the latitudes and longitudes do not match up. Thanks again
> for all of your help.

Humm. Well, I don't see any reason this doesn't work
perfectly. :-)

Liam is setting up the map projection for you (Mercator
in this case), and the wind barbs are certainly going onto
the map in data coordinate space. Makes me think you
are not doing the CURSOR command properly. Are you using
the DOWN and DATA keywords with it? And are you using
it immediately after you run this program?

Just don't have many other ideas.

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Overlaying gridded winds on satellite data
Posted by Chris[3] on Wed, 20 Jul 2005 16:33:55 GMT
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Hey David,

Thanks for your help...when I run the cursor command...I run it right after the imagemap procedure...then after that I run it after the windbarb procedure...and when I do that...the result is differing latitudes and longitudes of only about .05 degrees. When I use the cursor command...this is how I write it.

cursor, long, lat
print, lat, long

I see you mention something about DOWN and DATA keywords...what exactly do they do? Thank you again for all of your support.

Chris

David Fanning wrote:
> Chris writes:
>
>> I forgot to mention how I came up with my conclusion that the latitudes
>> and longitudes do not match up. I used the cursor procedure which I
>> then print to the screen to tell me the latitude and longitude of
>> certain pixels...I use the corner to make sure I click on the same
>> pixel...and the latitudes and longitudes do not match up. Thanks again
>> for all of your help.
>
> Humm. Well, I don't see any reason this doesn't work
> perfectly. :-)
>
> Liam is setting up the map projection for you (Mercator
> in this case), and the wind barbs are certainly going onto
> the map in data coordinate space. Makes me think you
> are not doing the CURSOR command properly. Are you using
> the DOWN and DATA keywords with it? And are you using
> it immediately after you run this program?
>
> Just don't have many other ideas.
>

> Cheers,
>
> David
> --
> David Fanning, Ph.D.
> Fanning Software Consulting, Inc.
> Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Overlaying gridded winds on satellite data
Posted by David Fanning on Wed, 20 Jul 2005 16:53:23 GMT
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Chris writes:

> Thanks for your help...when I run the cursor command...I run it right
> after the imagemap procedure...then after that I run it after the
> windbarb procedure...and when I do that...the result is differing
> latitudes and longitudes of only about .05 degrees. When I use the
> cursor command...this is how I write it.
>
> cursor, long, lat
> print, lat, long
>
> I see you mention something about DOWN and DATA keywords...what exactly
> do they do? Thank you again for all of your support.

The DOWN keyword makes sure you only get DOWN cursor events, not up or movement events. DATA makes sure your results are in data coordinates (you hope lat and lon in this case). I would definitely try this again with DOWN set. Cursor does DATA coordinates by default.

I just don't see where the error could be. I actually draw the wind barbs in normalized coordinates, but I use Convert_Coord to convert from data to normalized coordinates, and I have never had the least bit of trouble with that.

Don't know. Sorry. It is a pretty small error, it seems to me. Are you certain the continental outlines are in the right place?

Cheers,

David
--
David Fanning, Ph.D.

Subject: Re: Overlaying gridded winds on satellite data
Posted by Chris[3] on Wed, 20 Jul 2005 17:03:55 GMT
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Hey David...I think I have it worked out...in the imagemap procedure it has uses a border around the satellite data...where as the wind barbs do not...therefore... I eliminated the border from the satellite data...and found it to work then. I thank you again for all of your effort...this has frustrated me for a couple of days...and I knew it was a simple error. I have one more question for you though...in the wind barb procedure, when you say the wind barbs are pointing in the wrong direction...does that just mean the barbs and pennants are drawn on the wrong side of the line or the actual wind direction is thrown off by 180 degrees? Thanks again for the help.

Chris

Subject: Re: Overlaying gridded winds on satellite data
Posted by David Fanning on Wed, 20 Jul 2005 17:39:32 GMT
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Chris writes:

> Hey David...I think I have it worked out...in the imagemap procedure it
> has uses a border around the satellite data...where as the wind barbs
> do not...therefore... I eliminated the border from the satellite
> data...and found it to work then. I thank you again for all of your
> effort...this has frustrated me for a couple of days...and I knew it
> was a simple error.

Well, borders often come into play when we are working with images and map projections, and if you say it is fixed, I'll take your word for it. But something still doesn't make sense to me about this... But I'm willing to let it drop. I'm back in the US and the pile on my desk is HUGE. I probably have better things to do. :-)

> I have one more question for you though...in the
> wind barb procedure, when you say the wind barbs are pointing in the
> wrong direction...does that just mean the barbs and pennants are drawn
> on the wrong side of the line or the actual wind direction is thrown
> off by 180 degrees? Thanks again for the help.

I don't think I said the wind bards "are pointing in
the wrong direction". I think I said "I don't know for
sure *which* direction they should be pointing in, and
I had received contradictory advice from people who's
job it was to know. So I let you choose which direction
pleases you. But, in any case, I think everyone who complained
was complaining about the direction of the staff, not the flags.

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
Coyote's Guide to IDL Programming: http://www.dfanning.com/

Subject: Re: Overlaying gridded winds on satellite data
Posted by Chris[3] on Wed, 20 Jul 2005 20:31:27 GMT
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Hey David...I just wanted to thank you again for all of your
help...it's been great and I have learned a lot. I have one more quick
question for you...and I promise I'll try to not bother you again. With
the wind barb procedure...the second direction is the correct
way...however the barbs point in the wrong direction...do you know
which part of the code I can fix this in? Thanks a bunch for all of
your help.

Chris

David Fanning wrote:
> Chris writes:
>
>> Hey David...I think I have it worked out...in the imagemap procedure it
>> has uses a border around the satellite data...where as the wind barbs
>> do not...therefore... I eliminated the border from the satellite
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> was complaining about the direction of the staff, not the flags.
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> Cheers,
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> David
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> --
> David Fanning, Ph.D.
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