Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by tessp on Thu, 03 Jun 2010 03:29:20 GMT
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Sorry, should be rainfall on 0.5 to 359.5 lon, not 259.5

Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by David Fanning on Thu, 03 Jun 2010 04:06:17 GMT
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tessp writes:

> Not sure if this is even possible. I have two sets of meteorological
> data, one for rainfall and one for vorticity. From different sources,
> they are available on different latitude and longitude grids (i.e.
> rainfall on -89.5 to 89.5 lat, 0.5 to 259.5 lon: vorticity on 90 to
> -90 lat, 0 - 358.5 lon), with different grid spacing (1 deg vs 1.5
> deg) just for added fun. I want to plot both sets of data as contours
> over one (global) map projection. Any ideas anyone?

Ideas for what? Reducing visual clutter? I'm not at all
sure what you want ideas about. :-)

Cheers,

David

P.S. Of course, it is possible. The question you should
be asking is this: Is it a good idea?

--
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: Contour data with two different lon/lat grids onto the same map projection
Posted by tessp on Thu, 03 Jun 2010 04:19:53 GMT
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> Ideas for what? Reducing visual clutter? I'm not at all
> sure what you want ideas about. :-)

>
> Cheers,
>
> David
>
> P.S. Of course, it is possible. The question you should
> be asking is this: Is it a good idea?
>
> --
> 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.")

It's a very good idea. Looking for a link between potential vorticity and rainfall in certain areas of the globe. Unfortunately, the best datasets for the two variables come from different projects by different agencies. If I line contour the vorticity and shade the rainfall, it should highlight the dynamics of the atmospheric state without too much visual clutter.... I have done it for a couple of other situations, fortunately on the same grids, and it's quite informative! :o)

What I need is some ideas on how to do the contour plots, as my current method has incompatible x,y,z coordinates due to the grid mismatches (I think).

Any help from Coyote gratefully received as always. Followed by payment to Doctors Without Borders, if that's still charity of choice?

Regards
Tess

Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by tessp on Thu, 03 Jun 2010 05:38:42 GMT
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David - Have tried a couple of things, and it seems to run alright if I only upload the data (from netcdf files to idl variables) and run the plotting script once per IDL session. Running it twice in the same session appears to confuse the whole thing. However, would still appreciate your comments on the possibilities of plotting data on varying grids! - for my education...

Cheers
Tess

Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by penteado on Thu, 03 Jun 2010 06:56:57 GMT
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On Jun 3, 2:38 am, tessp <tesspar...@hotmail.com> wrote:
> David - Have tried a couple of things, and it seems to run alright if
> I only upload the data (from netcdf files to idl variables) and run
> the plotting script once per IDL session. Running it twice in the same
> session appears to confuse the whole thing. However, would still
> appreciate your comments on the possibilities of plotting data on
> varying grids! - for my education...

You need to say more about what you are doing and why it does not
work. It is (nearly) irrelevant that the two variables are in
different grids. You can just overplot them.

Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by David Fanning on Thu, 03 Jun 2010 11:46:48 GMT
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pp writes:

> You need to say more about what you are doing and why it does not
> work. It is (nearly) irrelevant that the two variables are in
> different grids. You can just overplot them.

Yes, I agree. The OVERPLOT keyword is basically
all that is needed here, which is why I was confused
about what kind of "ideas" you wanted.

You set your map data space, then simply overplot your
two contours onto it. What grid they are on is irrelevant.

More details as to the problems you have, please. :-)

Cheers,

David

--
David Fanning, Ph.D.
Fanning Software Consulting, Inc.
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Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by tessp on Thu, 03 Jun 2010 22:51:09 GMT
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On Jun 3, 9:46 pm, David Fanning <n...@dfanning.com> wrote:
> pp writes:
>> You need to say more about what you are doing and why it does not
>> work. It is (nearly) irrelevant that the two variables are in
>> different grids. You can just overplot them.
>
> Yes, I agree. The OVERPLOT keyword is basically
> all that is needed here, which is why I was confused
> about what kind of "ideas" you wanted.
>
> You set your map data space, then simply overplot your
> two contours onto it. What grid they are on is irrelevant.
>
> More details as to the problems you have, please. :-)
>
> Cheers,
>
> David
>

This is indeed what I do: as extract from script shows -
****
```
; First use cdf2idl process to read in precip, then pv files.
; Rainfall has total per day, pv has four timesteps per day.
;
; Get the netCDF data into IDL arrays
; Precip:
lon_g=fltarr(360)+lon
lat_g=fltarr(180)+lat
date_g=fltarr(22)+date
pcp=fltarr(360,180,22)+pcp
lonndx_g=long(size(lon, /n_elements))
latndx_g=long(size(lat, /n_elements))
datendx_g=long(size(date, /n_elements))

; PV:
lat=G0_LAT_2
lon=G0_LON_3
time=INITIAL_TIME0_ENCODED
pv=PV_GDS0_THEL*10^6.        ; pv now in PVU of 10^-6 K m^2 kg^-1
s^-1
lvl=LV_THEL1
lonndx=long(size(lon, /n_elements))
```

```
latndx=long(size(lat, /n_elements))
timendx=long(size(time, /n_elements))

k=6       ; 350K level only
date1=string(time[k])
date=strmid(date1,0,8)
utc=strmid(date1,7,2)
subb=string(date)+' '+string(utc)
counter=0L
daycounter=-0.25

For l=24,timendx-13 Do Begin       ; to match rainfall data days
available in gpcp dataset
   daycounter=daycounter+0.25      ; 4 PV to each rainfall day
   map_set,-25,130,0,LIMIT=[-5,100,-45,160], /isotropic, /mercator,
position=[0.1,0.1,0.8,0.8]
   contour,pcp[*,*,
 (long(daycounter))],lon_g,lat_g,levels=[((findgen(21)+1)*5.) ,200], $
           c_colors=(indgen(21)+1)+4,/isotropic, /cell_fill, $
           c_charsize=0.2, /overplot, /noerase
   contour, pv[*,*,k,l],lon,lat, levels=((findgen(25)*0.5)), $ ;
positive PV
           c_colors=0,/isotropic, /follow,
c_labels=[Replicate(1,25)], $
           c_charsize=0.5, /overplot, /noerase, color=0
   contour, pv[*,*,k,l],lon,lat, levels=(((findgen(25)-25)*0.5)), $ ;
negative PV
           c_colors=0,/isotropic, /follow,
c_labels=[Replicate(1,25)], $
           c_charsize=0.5, /overplot, /noerase, color=0

   map_continents, color=0, /hires
*********************************
```

However, if I load the variables from netcdf to idl variables, then run this script; it plots fine. If I immediately rerun the same script in the same idl session, I get the error:
"CONTOUR: X,Y, or Z array dimensions are incompatible."
The first couple of times I ran this script I was adding to it in stages, and running it to see what the results were; the error was a bit misleading in that way, as I thought it was the result of adding the pv grids to the rainfall grids I already had working on the plot. Hence my appeal to David and others for "ideas"! If I exit the IDL session and reload the variables in a new session to rerun the script, it plots fine first time. But only once per session!

Not sure why this happens, but unless it's immediately obvious to anyone it's probably not worth pursuing...
Cheers,

Tess

Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by David Fanning on Fri, 04 Jun 2010 02:22:51 GMT
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Tess writes:

> However, if I load the variables from netcdf to idl variables, then
> run this script; it plots fine. If I immediately rerun the same script
> in the same idl session, I get the error:
> "CONTOUR: X,Y, or Z array dimensions are incompatible."
> The first couple of times I ran this script I was adding to it in
> stages, and running it to see what the results were; the error was a
> bit misleading in that way, as I thought it was the result of adding
> the pv grids to the rainfall grids I already had working on the plot.
> Hence my appeal to David and others for "ideas"! If I exit the IDL
> session and reload the variables in a new session to rerun the script,
> it plots fine first time. But only once per session!
>
> Not sure why this happens, but unless it's immediately obvious to
> anyone it's probably not worth pursuing...

Well, I take it by "script" you mean an IDL main program (that is, not a procedure or function). There is plenty in just this small code sample to cause me to well believe such a script might cause you trouble.

In fact, in spite of Mike Galloy proclaiming here the other day that he often uses main programs, I rarely do. And for exactly this reason. They can get you in a world of strange hurt. You would probably find out in a minute or two why you can't run the program more than once if you made a procedure out of it.

I'm mostly confused by statements like this, though:

"if I load the variables from netcdf to idl variables..."

When you read the netCDF variables out of the file they ARE IDL variables. No need to load anything. Any why is the graphic being drawn over and over again in the same window in a loop!?

I'm just not sure what to make of all this. Especially when

I see the limits on the MAP_SET command, which have no logical
connection to the latitude and longitude coordinates discussed
in your previous communications.

Perhaps this is just too small a code fragment to visualize the
rest of it. But, I would say, if it works at least once, I'd be
tempted to let it go as a good show. :-)

Cheers,

David

--
David Fanning, Ph.D.
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Sepore ma de ni thui. ("Perhaps thou speakest truth.")

Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by David Fanning on Fri, 04 Jun 2010 17:07:21 GMT
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mgalloy writes:

> I use main-level programs as a place to start or to place an example at
> the end of a file containing regular routines. Anything more complex
> than a few lines should be in a function/procedure. But the nice part is
> that it is easy to just add the "pro/function my_routine, a, b, etc.."
> line at the top of the main-level program to change it into a routine.
> After coding and getting something working, 99+% of what gets committed
> and kept is in regular routines.

I use main-level programs this way, too. But I see plenty
of people who use them (misuse them?) almost exclusively
and I think that is a big mistake, since it almost always
leads to unanticipated errors once you get more than about
10 lines of code in the darn things.

I certainly didn't mean to pick on you, but I'm almost
certain that if you can't run a program twice and get
the same result, it is programmer error in a main program. ;-)

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: Contour data with two different lon/lat grids onto the same map projection
Posted by tessp on Wed, 09 Jun 2010 01:59:34 GMT
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> Well, I take it by "script" you mean an IDL main
> program (that is, not a procedure or function).
> There is plenty in just this small code sample
> to cause me to well believe such a script might
> cause you trouble.
>
> In fact, in spite of Mike Galloy proclaiming here the
> other day that he often uses main programs, I rarely
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> out in a minute or two why you can't run the program
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>
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> "if I load the variables from netcdf to idl variables..."
>
> When you read the netCDF variables out of the file they ARE
> IDL variables. No need to load anything. Any why is the
> graphic being drawn over and over again in the same window
> in a loop!?
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> I'm just not sure what to make of all this. Especially when
> I see the limits on the MAP_SET command, which have no logical
> connection to the latitude and longitude coordinates discussed
> in your previous communications.
>
> Perhaps this is just too small a code fragment to visualize the
> rest of it. But, I would say, if it works at least once, I'd be
> tempted to let it go as a good show. :-)
>
> Cheers,
>

> David
>
> --
> David Fanning, Ph.D.

David - Yes, script is my word for main program. I write a heap of different programs to do things, and haven't ever got around to making them into proceudres; although I agree with Mike that I wouldn't change the code much if at all, were I to do so....This is mainly due to time pressures, and the fact that once I have done something and got the plots I need it's generally on to the next thing on the list. The code is generally not pretty, but it works - usually. :o)

When I talk about loading the netcdf variables to IDL variables that is just my clumsy terminology for reading the data out of the netcdf file.

The map is being drawn over and over again to a postscript file in a loop because I am plotting each timestep of the data, usually every 6 hours, to get a sequence of maps showing the development of the atmospheric variables I'm looking at. Stepping through the .ps file then shows how weather systems develop over the time period of interest.

The limits on the map_set command are to map just the Australian region. In my full code I have options to do this, or the whole globe, or just the southern hemisphere.

Andy from Reading has my full code and data, and is taking a look at this for me....so he may have some insight into the issues I'm having when running it more than once.

Subject: Re: Contour data with two different lon/lat grids onto the same map projection
Posted by tessp on Thu, 10 Jun 2010 23:01:13 GMT
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>
> Andy from Reading has my full code and data, and is taking a look at
> this for me....so he may have some insight into the issues I'm having
> when running it more than once.

Thanks, Andy, for pointing out that I have managed to confuse the two latitude and longitude arrays. So yes David, you were right! -
"I'm almost certain that if you can't run a program twice and get the same result, it is programmer error in a main program. ;-)"

Good advice from Andy to do the basic checks by looking at the lat and lon arrays at various stages of my code, which soon points up the error. Many thanks for your help Andy, much appreciated.

Thanks David and Mike for your input also.
