Subject: trying to convert map to graphic functions
Posted by Brian McNoldy on Fri, 10 Jun 2016 13:38:54 GMT
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I still don't use the "new" graphics system much, just because the old way is so entrenched in my memory. But I do really like the new system when I do try it (and can get it to do what I want). I have a plot that I'd love to switch over, but have had a rather hard time getting the same behavior.

It begins with a map (box axes, 0.5 degree lat/lon spacing, simple decimal degree labels aligned parallel with the axes). Then I have a series of colored dots on there (looks like a squiggly rainbow line), where the colors vary by altitude. Then there are wind barbs, which are also colored by altitude. The wind barbs have a quality flag value printed next to them. Finally, I draw circles around the top and bottom points of the colored dots.
The code looks like this:

```
   window,0,xsize=900,ysize=950
   loadct,39
   !p.color=0
   !p.background=255
    map_set,/cyl,limit=[min(lat)-2,min(lon)-2,max(lat)+2,max(lon
)+2],/isotropic,/noborder,position=[0.02,0.04,0.98,0.90]
   map_continents,/hi,/coasts
   map_grid,latdel=0.5,londel=0.5,/box_axes
   for p=0,n_elements(pres)-1 do begin
       plots,lon[p],lat[p],psym=3,thick=10,symsize=5,color=(pres[p] /max(pres))*254
   endfor
   plot_range_rings2,dist_thresh*111.2,lon[0],lat[0],color=50
    plot_range_rings2,dist_thresh*111.2,lon[-1],lat[-1],color=23 0
   for p=0,n_elements(amv_pres)-1 do begin
      wind_barb,amv_wspd[p],amv_wdir[p],amv_lons[p],amv_lats[p],$
        size=0.1,color=(amv_pres[p]/max(amv_pres))*254
       xyouts,amv_lons[p],amv_lats[p],string(amv_qi[p],format='(f4. 2)'),$
        charsize=1,/data,noclip=0
   endfor
   xyouts,0.5,0.96,title_string,charsize=3,align=0.5,/normal
```

The figure looks like this:
http://andrew.rsmas.miami.edu/bmcnoldy/tmp/map_example.png

I have been stumped just trying to get the grids and labels to look the same! I'm also not sure how to loop through and vary the plotting color by value using SYMBOL but not in indexed color space.

Maybe this is a case where it's best to stick with what I've got, but if anyone has any quick insights, I'd be happy to try them!

Thanks,
Brian

Subject: Re: trying to convert map to graphic functions
Posted by Phillip Bitzer on Wed, 05 Oct 2016 14:14:39 GMT
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On Friday, June 10, 2016 at 8:38:56 AM UTC-5, Brian McNoldy wrote:
> I still don't use the "new" graphics system much, just because the old way is so entrenched in my memory. But I do really like the new system when I do try it (and can get it to do what I want).
> I have a plot that I'd love to switch over, but have had a rather hard time getting the same behavior.
>

So, I'm a little late with this, but this is exactly the sort of thing that is absolutely necessary - examples of how to bridge the gap between pre-FG and post-FG.

I've been using FG quite a bit, and mostly like them. The biggest adjustment?The way you think about how to make plots is different in DG/CG and FG.

Here's the code to get something close to your plot. I've generated some dummy data. I also tend to be quite verbose in my code. I separated a lot of the setting of properties so we can see exactly what each one does.

```
;first, generate the dummy data
lat = INTERPOL([22.1, 22.4], 100)
lon = INTERPOL([-74.25, -74.1], 100)
press = INTERPOL([1000, 100], 100)

;generate the map:
mapLimits = [MIN(lat)-2,MIN(lon)-2,MAX(lat)+2,MAX(lon)+2]

m = MAP('Cylindrical Equal Area', LIMIT=mapLimits)

;set some properties, including the grid
m.mapgrid.LINESTYLE = 'dotted'

m.mapgrid.LABEL_ANGLE = 0
m.mapgrid.LABEL_POSITION = 0

;let's change the default formatting
;Look ma! Lambda function!
m.mapgrid.LABEL_FORMAT=LAMBDA(orientation, location, fractional, defaultLabel :
STRING(location, FORMAT='(F7.2)'))

m.mapgrid.box_axes = 1
m.mapgrid.GRID_LONGITUDE = 0.5 ;similar to londel in direct graphics
```

```
m.mapgrid.GRID_LATITUDE = 0.5 ;similar to londel in direct graphics

;add some continents
mCont = MAPCONTINENTS(/HIRES)


;now, let's add the data, colored by pressure

;first, byte scale the pressure to 0->255
ind = REVERSE(BYTSCL(press)) ;reverse to make the smallest pressures correspond to higher
indices (reds)

p = PLOT(lon, lat, $
  RGB_TABLE=39, VERT_COLORS=ind, $ ;set the colors
  SYMBOL=3, THICK=4, /OVERPLOT)

;plot some wind barbs

;generate some random locations
nStations = 10
wLat = RANDOMU(1L, nStations) * (mapLimits[2]-mapLimits[0]) + mapLimits[0]
wLon = RANDOMU(2L, nStations) * (mapLimits[3]-mapLimits[1]) + mapLimits[1]

;some random speeds and directions, too
wSpd = RANDOMU(3L, nStations) * 40.
wDir = RANDOMU(4l, nStations) * 360.

;get the horizontal/vertical components of the vector
uVec = wSpd * COS(wDir * !DTOR)
vVec = wSpd * SIN(wDir * !DTOR)

;plot the vectors
wb = VECTOR(uVec, vVec, wLon, wLat, $
  VECTOR_STYLE=1, COLOR='blue', /OVERPLOT)
```