

Practical Exercises in GrADS

First International Training Workshop
WMO RCC-Washington

NOAA's CPC International Desks

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GrADS script: plot_precip_wind_temp.gs

1. Go to the directory *introduction_grads*

```
cd introduction_grads
```

2. Open the GrADS script *plot_precip_wind_temp.gs*

Linux: `gedit plot_precip_wind_temp.gs` &

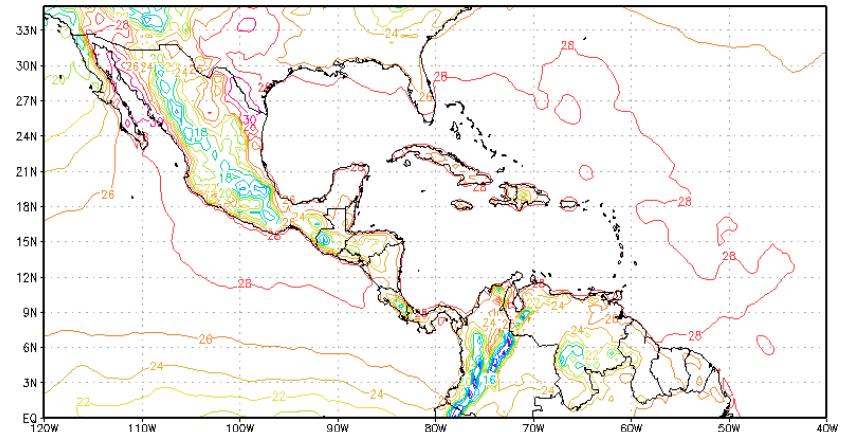
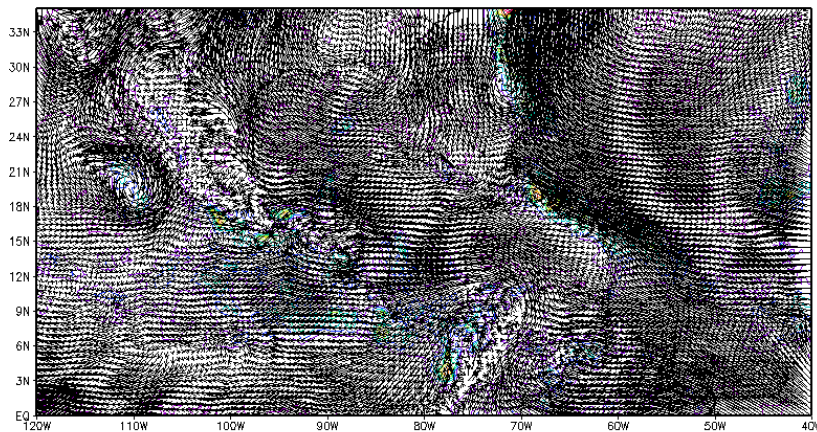
Cygwin: `npp plot_precip_wind_temp.gs` &

3. Run the GrADS script *plot_precip_wind_temp.gs*

```
grads -lc plot_precip_wind_temp.gs
```

4. Hit the `enter` key to see the next plot

Do you get these maps?



Shell script: `my_plot.sh`

5. Open the shell file `my_plot.sh`

Linux: `gedit my_plot.sh &`

Cygwin: `npp my_plot.sh &`

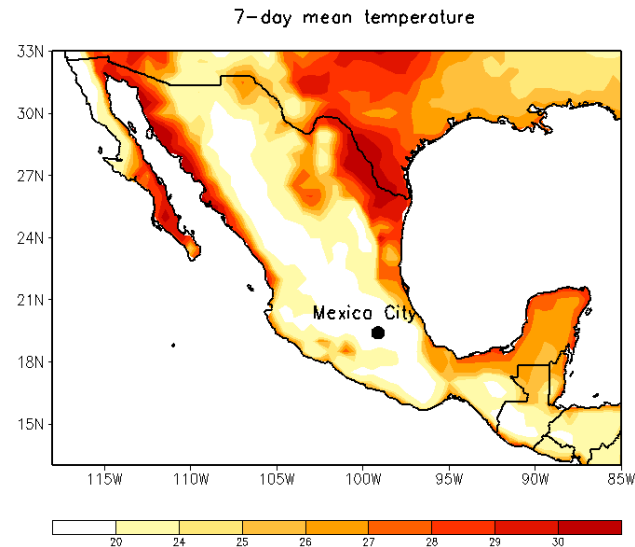
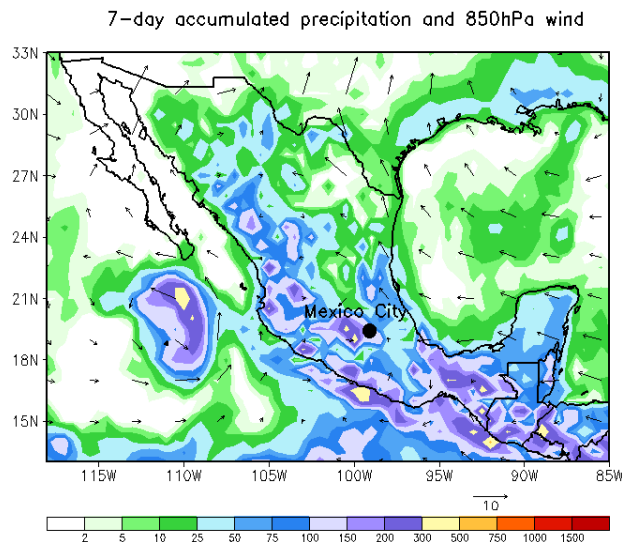
6. Change the file permission to make it readable, writable and executable

```
chmod 777 my_plot.sh
```

7. Run the shell script `my_plot.sh`

```
./my_plot.sh
```

8. Edit the file `my_plot.sh` to generate customized forecasts for your domain of interest

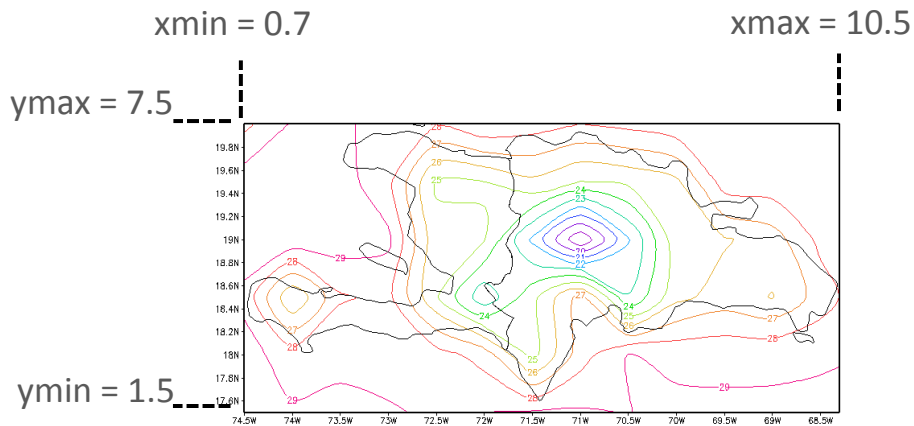


Adjust the geographical domain

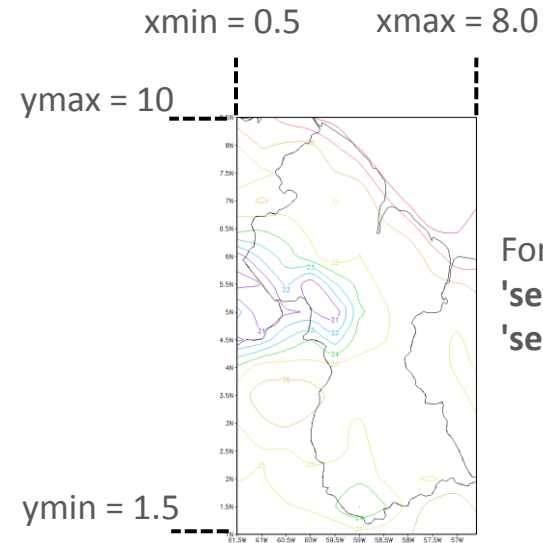
- **Lines 9, 10, 11 and 12** – Change the coordinates to target your domain of interest
- **Lines 109 and 110** – Define the page dimensions (**vpage**) and the area for plotting the maps (**parea**)

'set vpage x_min x_max y_min y_max'

'set parea xmin xmax ymin ymax'



For landscape mode
'set vpage 0 11 0 8.5'
'set parea 0.7 10.5 1.5 7.5'



For portrait mode
'set vpage 0 8.5 0 11'
'set parea 0.5 8.0 1.5 10'

- **Line 243** – Run the GrADS script in **landscape** or **portrait** mode
`grads -lc plot_reanalysis.gs` or `grads -pc plot_reanalysis.gs`

Colors

- **Line 113** – Set graphic type as shaded contour plot
'set gxout shaded'
- **Line 115** – Call the function *define_colors* placed in the directory *grads_files*
'./grads_files/define_colors'
- **Lines 130 and 131** – Define levels and colors for precipitation (*rain*)
'set clevs 2 5 10 25 50 75 100 150 200 300 500 750 1000 1500'
'set ccols 0 31 35 37 42 45 47 51 53 55 21 23 25 27 28'



- **Lines 194 and 195** – Define levels and colors for mean temperature (*temp*)
'set clevs 20 24 25 26 27 28 29 30'
'set ccols 0 21 22 23 24 25 26 27 28'



Color bar

- **Lines 140 and 201** – Call the function `cbarmerc2` placed in the directory *grads_files* to add a color bar
`'./grads_files/cbarmerc2'`
- **Line 23** – Adjust the vertical position of the color bar (*do not forget the sign*), if needed
`yy_colbar=-1`
- **Line 26** – Adjust the height of the color bar (*do not forget the sign*), if needed
`height_colbar=+0.2`
- **Line 29** – Adjust the label color of the color bar, if needed
`col_colbar=1`
- **Line 32** – Adjust the width of the characters of the color bar, if needed
`hsiz_colbar=0.09`
- **Line 35** – Adjust the height of the characters of the color bar, if needed
`vsiz_colbar=0.11`
- **Line 38** – Adjust the label thickness of the color bar, if needed
`thick_colbar=5`

Adjust wind vectors and add ocean mask

- **Line 137** – Adjust the number of wind vectors

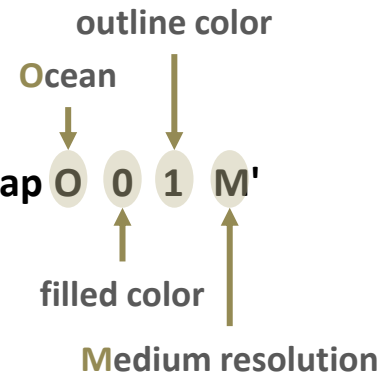
'd skip(u,5,4);v'

Only for Central American countries, Guyana and Suriname (if needed)

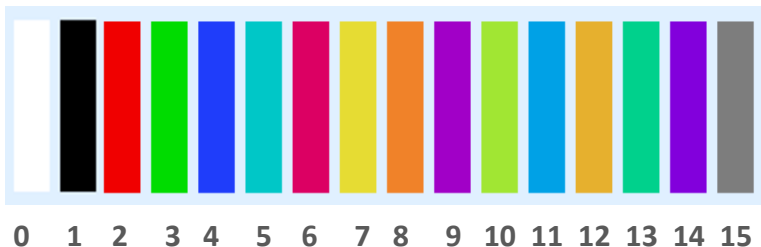
- **Line 204** – Call the function *basemap* placed in the directory *grads_files* to add an ocean mask on the temperature map

outline color
Ocean
filled color
Medium resolution

./grads_files/basemap O 0 1 M'

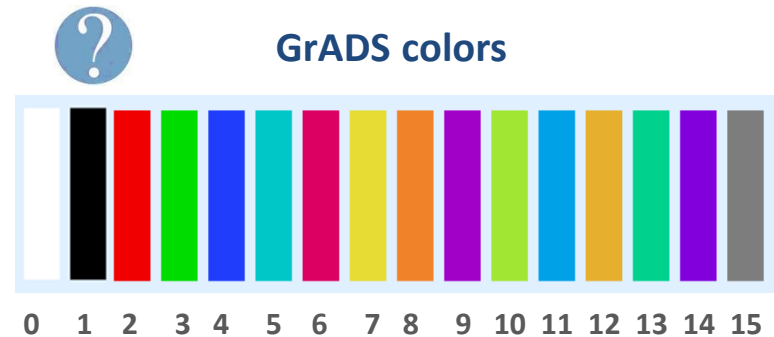
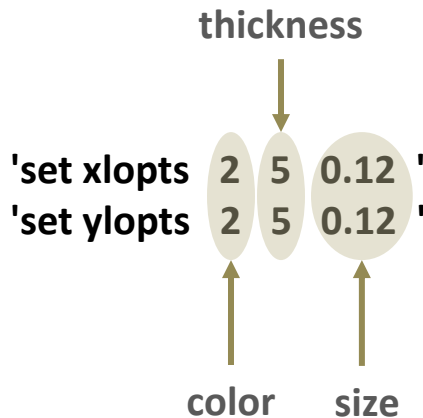


GrADS colors



Axis labels

- **Lines 122 – 123 and 186 – 187** – Adjust the latitude interval (**xlint**) and longitude interval (**ylint**)
'set xlint 10'
'set ylint 10'
- **Lines 126 – 127 and 190 – 191** – Change the appearance of x-labels (**xlopts**) and y-labels (**ylopts**)



- **Line 100** – Remove the grid
'set grid off'
- **Lines 119 and 183** – Turn off Grads and time labels in the bottom of the plot
'set grads off'

Add marker to localize a station

- **Lines 18 and 19** – Uncomment the two lines and write the coordinates of a station in your country

```
lon_station = -99.1
```

```
lat_station = 19.4
```

- **Lines 148, 149 and 150** – Convert the latitude and longitude coordinates to world coordinates

```
'query w2xy ${lon_station} ${lat_station}'
```

```
xx_station = subwrđ(result,3)
```

```
yy_station = subwrđ(result,6)
```

- **Lines 153 and 212** – Draw a marker to localize the station

```
'draw mark 9 'xx_station' 'yy_station' 0.2'
```

↑
type of marker

↑
size of the marker



Types of marker



- **Lines 156 – 157** – Adjust the position of the station name

```
posx_station = xx_station - 0.2
```

```
posy_station = yy_station + 0.3
```

- **Lines 160 – 161 and 215 – 216** – Adjust the font size of the title

```
'set strsiz 0.17 0.18'
```

```
'set string 1 c 6'
```

- **Lines 164 and 219** – Add the name of the station

```
'draw string 'posx_station' 'posy_station' Mexico City'
```

Add title and save maps

- **Line 169** – Add a title for the precipitation and wind map in the **x=5.5** and **y=8.0** position
'draw string 5.5 8.0 7-day accumulated precipitation and 850hPa wind'
- **Line 224** – Add a title for the temperature map in the **x=5.5** and **y=8.0** position
'draw string 5.5 8.0 7-day mean temperature'
- **Line 174** – Save the precipitation and wind map as .png
'printim precip_wind.png'
- **Line 229** – Save the temperature map as .png
'printim tmean.png'

Save and run the shell script *my_plot.sh*

```
./my_plot.sh
```

Check the maps you have generated