Lab-2: Application of shell-scripting Jun.-8, 2012

There are two separate tasks today which both utilize c-shell scripting to get input data (wget utility), to process this data (nawk utility), and to present it in graphical form (plotxy utility). Please conduct ALL operations via script that will also serve as documentation of what you did.

Task-A

Present ocean currents at KS04 as a time series for the week starting April-1, 2008:
… Download file KS04.dat01 which contains time, u_east, v_north as column 1, 2, and 3;
… extract 7 days worth of data (time-step is 0.5 hours), starting at t=1917 days (column-1) into a file I call input.dat
… execute a new_file (to be created separately, see below) via the command "plotxy new_file"
… display the (postscript) output from the plotxy utility as "gs mypost"

Plotxy is an application developed by Robert Parker at Scripps Institution of Oceanography (http://www.ngdc.noaa.gov/geomag/pmag/plotxy.html) which reads a set of commands stored in a text file refered to as new_file above. You may give this type of file the .plt extension, but this is not necessary (except to perhaps keep your sanity with all these new files and functions and scripts). A good start to plot a time series are the following text entries (% comments):

```
file input.dat     % this tells plotxy which file to read and plot
mode 20 1 2        % this tells plotxy that you specify (20) that x and y are column 1 and 2
read               % read the above data
plot               % plot the above data (stop here and check, the stuff below is optional)
stack              % stack a second plot above the prior one
mode 20 1 3        % now you are plotting column-3 against column-1
ylim 2             % you specify that the y-axis is 2 inches high
ylab v (cm/s)      % now you also specify a label for the y-axis
symbol 1 0.1       % now you specify that instead of a line (default), you want a symbol
read
save               % save this plot, but more overlay will come
symbol -1          % turn off symbols, return to defaults
read
plot
```

Task-B

Try to identify Petermann Ice Island B1 in a somewhat clear MODIS image of Baffin Island and adjacent ocean for June-6, 2012:
… Download the file loc which contains latitude, longitude, z1 as columns with z1 the fraction of "red" light received at the satellite (it contains data from 55N to 72N at 250-m resolution);
… The last reported position (May 26/27, 2012) of this ice island is 69:37N and 65:48W
… extract a small subset of the data as you may not want to deal with 300 MB files each time
… create and execute a new_file2 (to be created separately, see below) via the command "./new_file2" that contains a set of GMT (General Mapping Tools)

GMT is a popular and versatile map-making set of programs initially developed at the University of Hawaii (http://gmt.soest.hawaii.edu/). Commands are executed line by line to built a map of increasing complexity via overlays. These commands are best placed in a separate shell-script (new_file2.g, say) as each command contains a large number of abstract options that provide for a range of variations, control in a most concise (but abstract) way. [We do one or two together.]