

Lessons Learned (as of December. 2019)

NCL coding

Problem: When plotting data, such as sea ice data from CESM, which is not on a regular grid, cannot use normal routine to plot it. This normally coincides with having 2D latitude and longitude variables.

Solution: Need to set the variable to `@lon2d=lon` and `@lat2d=lat`. Must ensure that am using the `gsn_csm_***` plot routines, doesn't work without `csm`. See https://www.ncl.ucar.edu/Applications/Scripts/ice_3.ncl for a good example of polar plot. Also, `gsn_csm_contour_map_polar` is a great script I didn't use before.

Problem: Drawing ice sheets in Antarctica

Solution: Haven't used this yet but the solution can be found at https://www.ncl.ucar.edu/Applications/Scripts/maponly_19.ncl

Problem: The variables did not match what I expected. It turns out the nc file was scaled and offset (so called short type) with the scale and offset being in the file description

Solution: ncl can automatically solve this problem using the function `short2flt()`: see here <https://www.ncl.ucar.edu/Document/Functions/Contributed/short2flt.shtml>

Problem: When saving files larger than 2gb you often get an error about invalid dimension sizing

Solution: After removing previous file, put in `setfileoption("nc","Format","LargeFile")` https://www.ncl.ucar.edu/Support/talk_archives/2011/0599.html

Problem: Trying to regrid from a 2d lat lon grid to a 1d grid (rectilinear)

Solution: Use the `rcm2rgrid_Wrap` function http://www.ncl.ucar.edu/Document/Functions/Contributed/rcm2rgrid_Wrap.shtml

Problem: When drawing contour plots over map projections (or just maps) and you want a perimeter around the curved map.

Solution: Turn `@mpPerimOn=False`. If this option is true, a rectangular box will be drawn, regardless of the shape of the map. Instead you need to do something like this

```
res@mpGridAndLimbOn = True  
res@mpGridLatSpacingF = 45.  
res@mpGridLonSpacingF = 60.  
res@mpGridLineColor = "Gray99"  
res@mpGridAndLimbDrawOrder="PreDraw"
```

The first and the last line are the most important. The last line is key because it means that the overlaid contours go over the grid lines and you can't see them (of course if you want to see the grid lines, don't write the last line).

Problem:

Solution:
