Exercise: Regridding and Differencing

AIM: To introduce you to regridding (interpolation) in CDAT and differencing 2 datasets.

Issues covered:

- Regrid method
- Regrid package
- Pressure level regridding
- Differencing

Instructions

1. Open 2 files that hold relative humidity on different grid definitions ('~/my_cdat_files/data/rh1.nc', '~/my_cdat_files/data/rh2.nc') and extract the variables.
2. Examine the different shapes of the two variables.

Note that rh1 is located on a regular 2.5° grid and rh2 is located on a full N80 Gaussian Grid. Plot both variables.

3. Use the second grid file as the output grid and extract its grid object.
4. Now use the built-in regrid method on 'rh1' to re-calculate it on the grid used by 'rh2'.
5. To difference the two datasets you just subtract one from another.
6. Alternatively, you might want to use the Regridder class to create your own function (useful when re-using). Start by importing the Regridder class from the regrid package.
7. Get the grids of both variables.
8. Create a regrid function called 'regridfunc' from the Regridder class instance.
9. Regrid 'rh1' using the 'regridfunc' function.
10. Try regridding the pressure levels that 'rh1' is defined on. First of all, check to see which levels it holds.
11. Now use the variable method 'pressureRegrid()' to recalculate your variable on the new pressure levels (250, 225, 200).

Note that you will have to use the "cdms.createAxis()" function and then the "designateLevel()" method on the resulting object.

12. Check the levels and the shape of the new variable.