

RegCM4 Output

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netCDF format

The model output is now in netCDF format.

- ASCII
 - Easy to read if small
 - Can get large
 - Have to know structure to make plots
 - Slow to read, write
- Binary
 - Smaller, faster than ASCII
 - Have to know structure
 - Not necessarily portable
 - Opaque from outside application
- netCDF
 - Binary indexed portable format with standard access API

What are Metadata

Metadata are data about the data

- Name of variables
- Description of them using conventions
- Unit of measure
- Relations between variables
- Global file level attributes

netCDF format allows convenient storage format of data along with Metadata. It is flexible, Open Source and has multiple programming language interfaces.

Example Read Programs

You can find a FORTRAN example program to read NetCDF output files under the Tools/Programs directory.

- ReadRegcmio program
- Read example of netCDF format data
- Just scans input file and reports what is inside.
- If t2m is found, calculates mean value.

Climate Simulation

- A single run is not enough
- Climatic model data are meaningful only as statistical means
- Model validity is to be checked against observation data
- Nice plots are needed to show scientific results

Usually scripting languages are used to glue general purpose tools to go from output data files to final result plots, obtained from scientific data visualization programs.

The PostProc directory

- sigma2x programs interpolates model sigma level output to pressure or heighth levels
 - Input format is netCDF , output format is netCDF
 - If you want different pressure/heighth levels, just edit the file
- GrADS programs ¹
 - GrADSNcPrepare creates ctl and projection info for GrADS program
 - GrADSNcPlot prepares the two files above, fire up GrADS, waits for the session to close and removes temporary files.

¹Grads 2.0 is needed, 2.1 is suggested.

The PostProc scripts

Two scripts are given as hint program to users, to suggest possible usage of the NCO and CDO tools.

- regrid script
 - Interpolates model output to a regular lat/lon grid
- average script
 - Possible initial guide to cdo program average functions

We strongly suggest users a direct access to this programs!
They are too much powerful for us to limit their capabilities.

The Tools directory

Lot of programs can access NetCDF format, and some of them can perform real powerful analysis tasks.

- GrADS program
- Ferret program
- NCL CISL NCAR Command Language
- R statistical language

Some example scripts are given in the Tools/Scripts directory. The GrADS ones are what we currently use to perform multiyear seasonal analysis validation againsts CRU observation dataset.