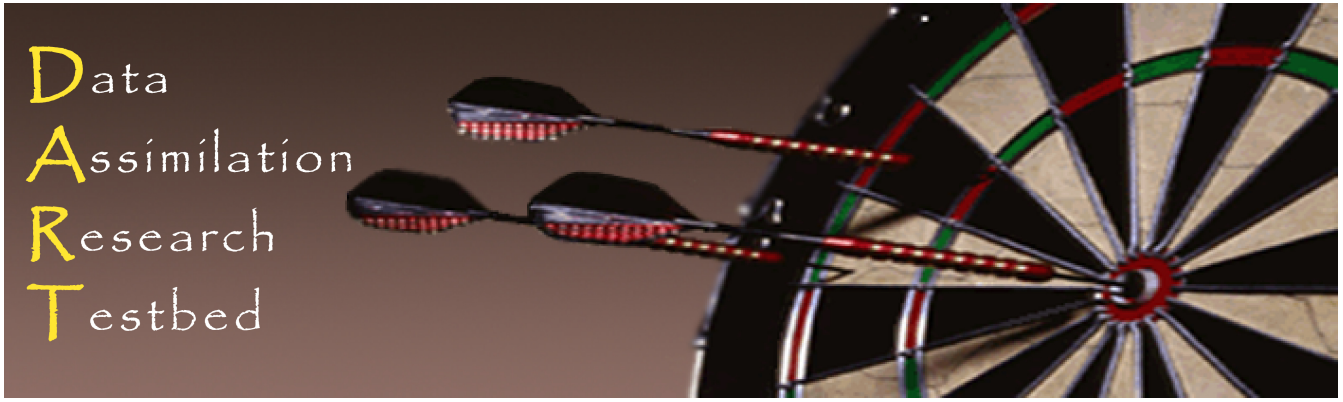
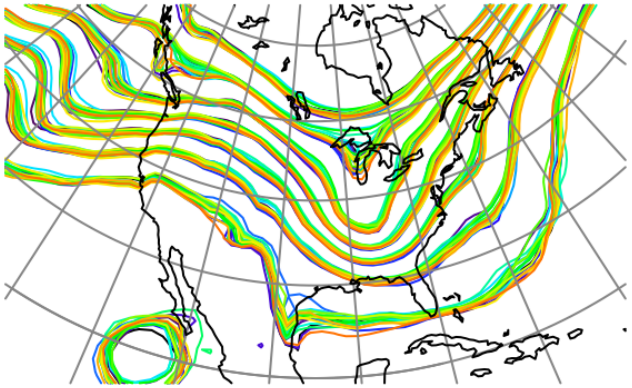


DART Tutorial Section 3:
DART Runtime Control and Documentation



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DART Philosophy: configurable at run-time

Use F90 namelist facility to do this.

Each F90 module can have its own associated namelist file.

All namelists combined in a single file, *input.nml*, in *work* directory.

Documentation of modules including namelists in html files.

Code for module ***cov_cutoff_mod***

Documentation for module.

Run-time control for module.

Example: Changing to a multivariate filter.

models/lorenz_63/work/

Section 1 Lorenz_63 example:

- Observed x, y, z components.
- Observation of x only impacted ensemble for x, etc.

Let's convert to a multivariate filter:

- Observations of x will impact ensembles for x, y and z.

To do this, will modify a namelist setting:

- Change will be made in file *models/lorenz_63/work/input.nml*.
- Modification to `assim_tools_nml`.
- Namelist parameter of interest is *`cutoff`*.

Example: Changing to a multivariate filter.

Open a browser and look at file
assimilation_code/modules/assimilation/assim_tools_mod.html.

Has a variety of sections:

- Overview;
- List of other modules used;
- Public interface (how to use this in another module);
- Details of public interfaces and variables;
- Namelist (what we're interested in for now).

The namelist section lists all runtime control variables for `assim_tools`.

- Gives description of each;
- *cutoff* controls distance to which observation has impact;

Originally very small: observation of x only impacts x.

Make it very big: all observations impact all state variables.

Example: Changing to a multivariate filter.

Edit *models/lorenz_63/work/input.nml* – it contains namelists for all modules used with Lorenz_63. The program *filter* uses namelists from many modules, one of which is the *assim_tools* namelist.

Modify *assim_tools_nml* namelist parameter *cutoff;* when program *filter* is run again, it will incorporate this modification.

Change to 1000000.0

Start of namelist for assim_tools module

```
&assim_tools_nml
   filter_kind                     = 1,
   cutoff                          = 0.00001,
   sort_obs_inc                    = .false.,
   spread_restoration              = .false.,
   sampling_error_correction       = .false.,
   adaptive_localization_threshold = -1,
   distribute_mean                 = .false.,
   output_localization_diagnostics = .false.,
   localization_diagnostics_file   = 'localization_diagnostics',
   print_every_nth_obs             = 0
   /
```

End of namelist for assim_tools module

Example *input.nml.xxxxxx_default* files for each program are automatically constructed by compilation tool (Section 11). It is usually convenient to have **one** *input.nml* containing all the settings for the commonly-used programs.

DART Tutorial Index to Sections