

Data Assimilation Research Testbed Tutorial

Section 3: DART Runtime Control and Documentation

Version 1.0: June, 2005

Philosophy: Make many things configurable at run-time.

Use F90 namelist facility to do this.

(In retrospect, this may have been a poor choice, but now standard).

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.

Example: Changing to a multi-variate filter.

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 multi-variate filter.

Open a browser and look at file *assim_tools/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 multi-variate filter.

Edit file *models/lorenz_63/work/input.nml*.

Contains namelists for all modules used with Lorenz-63.

Namelist name preceded by ampersand indicates start:

For instance, *&filter_nml* or *&assim_tools_nml*.

Modification to *assim_tools_nml*.

Namelist parameter of interest is *cutoff*.

Change cutoff from small value to 1000000.0

When program *filter* is run again, it will incorporate this modification.

input.nml automatically constructed by compilation tool (Section 11).