Data Assimilation Research Testbed Tutorial

Section 3: DART Runtime Control and Documentation

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Philosophy: Make many things 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.

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.

Change to directory assim_tools.

Open a browser and look at file 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;

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).