# The Nalanda release

**Modeling Services**

**FMS Developers' Forum**
**Princeton NJ**
**11 January 2007**

# Nalanda

# Proposed release schedule

Given the overall Valentine's Day planning schedule, the city releases will follow this pattern:

**nalanda** shared infrastructure code in nearly final form, February 2007

**omsk** component model codes in nearly final form, May 2007

**p,q...** MDT activity in full swing, with refactoring and optimization of infrastructure proceeding in parallel over subsequent releases.

# Nalanda key features: model codes

Key elements:

- 9.1.040 compiler:
  - changes answers with respect to 8.1, 9.0, BUT
  - faster compile and run times, key bugfixes (e.g `deledd`)
  - 100-year runs with CM2 underway to check climate compatibility
  - ***please*** use this compiler for any new runs not requiring bitwise matching with archived data.
- cube-sphere FV core with Held-Suarez tests complete (AM2 aquaplanet tests getting underway) – both FV cores available as separate invocations in the repository
- LM3V
- MOM4p1
- New AM modules: Shallow convection, Aerosol Transport, Convective Gravity, Stratopheric Chemistry linked to Tropospheric

# Nalanda key features: infrastructure

- MPP mosaic extensions
- **`horiz_interp`**, **`diag_manager`**, **`fms_io`** and **`xgrid`** mosaic extensions
- Water conservation diagnostics (ESM still not done?)
- **`diag_manager`** enhancements for CF-compliance
- offline and online regridding support for mosaics
- FRE enhancements.

Shared code very close to what's been released as **`memphis_2006_12`**, some modifications to coupler code still to be integrated (**`postmem_fil_fil`** tag and **`xgrid`** mosaic mods). Other changes that do not impact coupled runs can be accepted until a later date.

Tentative release date is 28 February 2007.

# Omsk: Key features

Key elements:

- AMIP run using cubed sphere
- all AM3 code modules in place
- LM3 in place: grid issues resolved
- ocean model cores in place
- conservation diagnostics extended to heat and other tracers?
- MPP mosaic extensions for nested and refined grids
- multiple-tiles-per-PE supported across shared infrastructure

Tentative release date is 31 May 2007.

# FRE enhancements

- Use of **`/ptmp`** by FRE for intermediate storage, reduction of tape requests.

- Multiple executable directories from a single source directory.

- A new **`<library>`** tag that enables you to bypass compilation of components you want to treat as a black box, including the FMS shared infrastructure.

- There will be changes to the FRE syntax to accommodate the enhancements. It is likely not the last change either... as we move toward use of the Curator DB.

An MI team meeting in the near future will lay out the new implementation.

# Modifications for CF compliance

Addition and modification of netCDF attributes *post facto* has proved to be costly, e.g in the CMOR effort. These modifications are intended to forestall some of these changes by incorporating many of the CMOR requirements at runtime.

**CF standard names** `register_diag_field` now has a way to add the `standard_name` attribute at runtime.

```
function register_diag_field( ..., standard_name, ...  )
character(len=*), optional, intent(in) ::  standard_name
```

This will need a modification to `nccmp` to ignore this attribute when diff'ing netCDF files.

We propose to begin with the list of standard names that are already known from IPCC AR4. We request scientists to cooperate with liaisons to add as many standard names as possible.

`http://www.cgd.ucar.edu/cms/eaton/cf-metadata/standard_name.html`

**Geo-referencing** adds the `coordinate` attribute to indicate geo-referencing coordinates on non-standard grid.

```
function diag_axis_init ( ..., aux, ...  )
!can be only either "geolon_t" or "geolat_t"
character(len=*), intent(in), optional ::  aux
```