

**Monthly Report
of the WRF Program Coordinator
to
Executive Oversight Board**

November-December 2004

1. **WRF Development and Implementation:**

- **Next WRF operational implementations:** (a) NCEP's **six-member WRF ensemble** system in the High-Resolution Window domains is expected to be ready for delivery to NCEP Central Operations (NCO) by 31 March 2005. Operational implementation will likely follow by 31 May, a two-month delay from the prior schedule due to software preparation issues. The small ensemble will be constructed using both the WRF-ARW and WRF-NMM dynamical cores, NCAR and NCEP physics suites (respectively) and four members using scaled bred perturbations applied to the ICs/BCs. (b) **AFWA's first operational WRF implementation** is now scheduled for summer 2005. The delay (about 4 months) from the original IOC date has been forced by some minor delays in software acquisition and testing. The NCAR WRF-3DVar analysis system is expected to be available for initializing the AFWA WRF system by IOC. Initial implementation is expected to take place for classified domains. Unclassified products will continue to depend on MM5 while the operational WRF-ARW system is evaluated. Transition of the unclassified domains from MM5 to WRF will be done in stages over the next several years.
- NCEP has announced a **six-month delay to 31 March 2006** for operational implementation of **North American Mesoscale (NAM) WRF-NMM**. Rescheduling was necessitated by delays acquiring 2004 IBM CSS computer **hardware upgrade**. First parallel runs of the 10-km WRF-NMM for evaluation compared to the operational 12-km Eta are expected by February 2005.
- NCAR continues work on **re-writing the WRF Standard Initialization (SI) code**, based on requirements collected from the community and partners.
- **Documentation of WRF Infrastructure:** A complete first-version of the WRF infrastructure documentation is now available from NCAR at the following address: http://box.mmm.ucar.edu/wrf/WG2/software_2.0/ NCAR will continue to upgrade the documentation over time.
- **Infrastructure Development:** As a clarification of earlier information, **exploratory work** now underway at NCEP is aimed first at **linking the Global Forecast System (GFS) to ESMF**. An important goal of this exercise is to assess the **level of effort** required to install a model into the ESMF superstructure, compared to the experience of installing a dynamical model into the present WRF

infrastructure. A second goal is to learn how much **computational penalty** is associated with running GFS in the ESMF superstructure, versus running externally. The information gained through this preliminary study will assist the other WRF partners in assessing their own paths toward ESMF compatibility and how WRF can best exploit ESMF capabilities. It should be noted that running a global model within the ESMF superstructure could be somewhat less demanding than running WRF, since the latter includes additional capabilities such as movable nested domains not found in the global model. NCEP also is taking steps to strengthen its ability to **support the current WRF infrastructure** prior to operational implementation of WRF-NMM on the North American domain in March 2006.

Meanwhile, NCAR has taken steps to prepare the current WRF infrastructure for linkage to the ESMF superstructure. At this time, NCEP's exploratory effort is not undertaking linkage of WRF to the ESMF superstructure. Any effort to do so would be preceded by evaluation of the ESMF-GFS and would include the previously discussed **joint workshop** involving all of the WRF partners. The workshop must examine the technical issues for charting a course to an infrastructure suited to the requirements of functionality, supportability and understandability.

- **Nesting for WRF:** With assistance from NCAR, NCEP has coded a **one-way nested** version of **WRF-NMM** and is adding MPI capability. The nesting code runs within the existing WRF software infrastructure and will be upgraded to include two-way interaction and moveable nests in early 2005. NCAR released a version of **WRF-ARW with moveable two-way nesting** in Fall 2004.
- **WRF-NMM version 2:** NCEP is continuing work toward a version 2 of WRF-NMM, including pre- and post-processors, by June 2005.
- **FAA's Product Development Team (PDT) leads** have expressed to FSL their intent to take a **more active role** in the model design and development phases of new modeling systems that could affect predictions of aviation impact variables. Such models include the North American WRF, Hurricane WRF and Rapid Refresh WRF, all intended for operational implementation at NCEP. Soon thereafter, FSL submitted to NCEP its first-draft design and development plan for the new **Rapid Refresh WRF** model that will replace RUC in **FY07**.

2. WRF Management

- The **next WRF ExOB meeting**, previously scheduled for 26 January 2005, is in the process of **being rescheduled**. Finding an alternative in February or March is proving difficult. Stay tuned for developments.

- **Army Research Lab** has expressed strong interest in becoming a **signatory to the WRF AIP**. The WRF ExOB will be polled to secure its agreement for ARL to attend their next meeting as an observer, prior to formal application to become a signatory partner.
- The WRF PC made quarterly site visits to NCAR (November) and AFWA (December) to help coordinate WRF development and DTC testing plans. Discussions included the creation of a WRF Five-Year Plan, developing a common plan to streamline the WRF software infrastructure, and finalizing membership for the WRF Research Applications Board.

3. **WRF and DTC – OTC**

- Both WRF-ARW and WRF-NMM models for the Boulder DTC's **WRF Winter Forecast Experiment** are now running daily on their intended 5-km CONUS domain. Products are available for viewing on preliminary web sites at <http://rain.mmm.ucar.edu/mm5> and <http://bolas.fsl.noaa.gov/mab/dwfe>, respectively. Scripts for final post-processing to provide real time AWIPS, FX-Net and web graphics products to the forecasters are being completed. Work is also proceeding on software and scripting of the verification system. While the models now are running routinely, as envisioned, the remaining steps for real-time delivery of forecast fields and images to the forecasters is necessary before the Winter Forecast Experiment can be declared fully underway.
- WRF Program Coordinator continued to work with NOAA and the DTC Director to coordinate **DTC FY05 workplan** and to **secure NOAA funding**.
- **Negotiations continue** between NCAR, NOAA and NRL to finalize a **DTC Terms of Reference**. Only a few differences remain. The TOR will be forward to WRF ExOB for approval as soon as it is agreeable to the DTC members.

4. **WRF and COPC**

- The draft version of the **WRF Joint Implementation Plan** has been delivered to the Chair of COPC Committee for Support And Backup (CSAB). Next, the telecommunications working group will address communications capacity issues.