

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

January 2005

1. **WRF Development and Implementation:**

- **Next WRF operational implementations:**
 - (a) NCEP's has delayed implementation of its **six-member WRF ensemble** system in the High-Resolution Window domains to 30 June 2005 due to software preparation issues. All six ensemble members are **now running daily**, consisting of two control versions (WRF-ARW and WRF-NMM), plus four versions with bred perturbations added to the initial conditions. Next tasks involve development of post-processing codes to generate and verify ensemble products.
 - (b) **AFWA's first operational WRF implementation** remains scheduled for summer 2005. Initial implementation is expected on classified domains, with subsequent staged transitions to WRF-ARW on remaining domains over the next several years.
- NCEP is on track for operational implementation of **North American Mesoscale (NAM) WRF-NMM** in March 2006. The CSS hardware upgrade has been completed. Work is now underway to assemble the first WRF-NMM forecast system **with fully cycled GSI data assimilation**. Development testing and evaluation is expected to begin by the end of February.
- NCAR is continuing to **re-write the WRF Standard Initialization (SI) and Real codes**. They are expected to be ready for release by summer 2006.
- **Infrastructure Development:** NCAR has introduced **changes to top-level (driver layer) WRF routines to conform to the ESMF "init/run/finalize" calling interface** for coupled applications. Additional work now underway will implement the "set-services" functionality so WRF can tell ESMF what it is and what it does. These changes are fundamental to making the current WRF common modeling infrastructure consistent with ESMF integration requirements.
- NCAR has begun discussions with NRL-Stennis and U. of Miami aimed at **coupling WRF to the HYCOM ocean model**, which will be valuable for NCEP's planned Hurricane-WRF system.
- **Nesting for WRF-NMM:** Testing of NCEP's **one-way nested-grid version of WRF-NMM** with the full GFS physics suite has been successful and is nearing completion. GFDL physics (preferred for hurricane simulations) will be added

shortly. Extension of the nesting capability to allow moveable nests will begin in February and should be completed in time for testing during the 2005 hurricane season. Finally, two-way nesting will be completed by Fall 2005.

- **Planning for WRF-NMM-version 2, code release and tutorial:** NCEP has completed coding and testing of the **threading** capability for WRF-NMM to insulate users from most details of shared memory processing. After some additional modifications, the new code will be installed in the WRF code repository and released to the public by **June 2005**.
- NCAR and NCEP are collaborating to establish the **first WRF-NMM tutorial** for new users. It will be held at NCAR in **June 2005** as part of the existing semi-annual WRF tutorial.
- NCEP/EMC held a **user orientation meeting** for scientists interested in its new **Gridpoint Statistical Interpolation (GSI)** system in January. About 25 individuals attended, including scientists from FSL and OU/CAPS.
- FSL and NCEP expect that the **domain of the Rapid Refresh WRF** will be expanded to include **Alaska and Puerto Rico**. Both organizations agree the expanded domain is a higher priority than increasing the resolution over the current RUC domain.
- Bob Rozumalski of NOAA/NWS is building a **Workstation WRF**, similar to the Workstation Eta model, for implementation at NWS Weather Forecast Offices and River Forecast Centers. The Workstation WRF can also be used by academic and private scientists who need an **easy-to-use, reliable daily forecasting capability** that can run on PCs or similar low-cost platforms. Both WRF dynamic cores will be included in Workstation WRF.
- **U. Washington** has started running real-time parallel versions of **WRF-ARW** as part of its **ensemble modeling system**. Results are being evaluated with the UW verification suite. UW is also running WRF-ARW in its real-time **Ensemble Kalman Filter (EnKF) research system**, which could provide a superior way to perform data assimilation in the future.

2. WRF Management

- The upcoming **WRF ExOB meeting** has been rescheduled to **13 April 2005** at NRL's headquarters in DC. An agenda and logistical information will be developed as the meeting approaches.
- After polling of the WRF ExOB, the **Army Research Lab (ARL)** has been invited to send an **observer to the ExOB meeting** in April. This will continue the process leading to ARL as a signatory of the WRF AIP.

- The WRF PC attended a two-day **training session at NAVO** in Bay St. Louis, MS, titled “**An Introduction to ESMF.**” The course reviewed the design of ESMF, its current status, and explained how to access and download codes. Users were shown how to initiate simple run procedures using basic ESMF components.

3. WRF and DTC – OTC

- The DTC **WRF Winter Forecast Experiment** officially began on 15 January and will continue through 31 March 2005. Both the ARW and NMM versions of WRF are **now running daily** on a 5-km domain, with products available on the WRF website, at <http://www.dtcenter.org/>, and via FX-Net and (soon) AWIPS. Preliminary verifications for precipitation calculated over the past weeks look very promising.
- The joint **AFWA/FNMOC Operational Test Center** is undertaking development of a **Joint Ensemble Forecast Systems (JEFS)**, which is a mesoscale ensemble project based on WRF, and will include integration of the WRF and COAMPS™ modeling systems.
- WRF Program Coordinator and DTC Director continued to work with NOAA and NCAR representatives to secure short-term and long-term **resourcing for the DTC**. NSF appears ready to provide \$50 K in new support for the DTC visitor program. This represents the **first tangible resourcing of the WRF program by NSF**. NCEP also has provided funds directly to the DTC.
- Agreement has been reached among NOAA, Navy and NCAR representatives on the draft **DTC Terms of Reference**. The completed TOR draft has been circulated to the WRF Program Office representatives for comment and soon will be forwarded to the WRF ExOB for approval. Following ExOB approval, it will be sent to agency administrators at NOAA, NCAR and NRL for formal signing.

4. WRF and COPC

- A draft **WRF Joint Implementation Plan** has been delivered to COPC’s telecommunications working group to develop a communications plan. AFWA and NCEP are coordinating plans to translate the North American WRF-NMM output fields onto a WRF-ARW grid. They are also developing a plan to provide contingency computational capacity and catastrophic backup. Meanwhile, FNMOC is working on its section of the WJIP.
- **FNMOC** is drafting its section of the **WRF Joint Implementation Plan** for delivery in February. The FNMOC plan will include current plans for I/O data exchange (satellite data, other observations and model forecast grids), short-term

plans for the joint AFWA/FNMOC Operational Test Center, and longer-term plans for integrating COAMPS™ with WRF. The integration plan is composed of three stages, beginning with **I/O field exchange, plug-and-play (interoperable) physics** and ending **with transition of the COAMPS™ dynamical core into a streamlined WRF software infrastructure.**

- COPC will hold its Spring 2005 meeting 23-24 March at the Office of the Federal Coordinator for Meteorology in DC.