

Monthly Report of the WRF Program Coordinator

August/September 2004

1. WRF Development

- The **WRF Executive Oversight Board met** on 30 July 2004 in Silver Spring. (See ExOB Minutes for details.) **Highlights** included:
 - WRF remains on track for operational implementation at AFWA and NCEP.
 - FNMOC's implementation plan is TBD.
 - NRL's transition of COAMPS I/O and physics to WRF is TBD.
 - The Central DTC and DoD's OTC have been activated.
 - Status report was given on measures for improving supportability of WRF software engineering infrastructure.
 - ExOB declared an Action Item to convene an interagency team to define requirements for a streamlined WRF infrastructure, develop a design, and estimate time and resources to develop and implement.
 - Charters for the WRF Management structure were reviewed and approved.
 - WRF Working Groups are to be reorganized to fit current WRF program.
 - Agency POCs are to provide the WRF PC information on FY05 WRF tasks, FTE commitments, funding and milestones.
 - The ExOB requested that a plan be drafted to transition WRF to a full-scale interagency program, based on a new MOA.

- **First WRF operational implementation:** NCEP conducted objective and subjective **WRF evaluations** for two versions of WRF (both cores) running in NCEP's High-Resolution Window (HRW) domains. WRF versions were compared to the former operational NMM and the 12-km Eta. Objective evaluations showed that, on average, WRF models perform about as well or slightly better than the two operational models. Subjective evaluations by two NWS Regional Headquarters, Aviation Wx Center and Storm Prediction Center unanimously favored WRF over the old NMM and Eta. All recommend implementation. The Program Coordinator briefed the NCEP **WRF operational implementation plan** to the NWS Director and the Corporate Board on 16 September. The implementation plan was **approved** and WRF began operational predictions on 27 September.

- **Next WRF operational implementations:** NCEP's six-member **WRF ensemble** system is now scheduled for **operational implementation by 31 March 2005** in the High-Resolution Window domains, due to delay in new computer installation. **AFWA's first WRF implementation** now scheduled for **April or May 2005**.

- **Documentation of WRF Infrastructure:** John Michalakes of NCAR has developed an **on-line documentation tool** for the WRF infrastructure that can also create in-line documentation of codes. NCEP is evaluating the documentation tool for possible adoption as a standard software for documenting the entire WRF system. NASA has also developed a documentation generator that NCEP is considering as a candidate for a WRF documentation standard. The WRF Program Coordinator will work with DTC, NCEP and NCAR to draft a **standard for WRF documentation** that can be presented to all WRF partner organizations.
- **User Support for the WRF Infrastructure:** NCAR has hired a **second software engineer** (Tom Henderson) to assist with development and user support for the current WRF infrastructure.
- **Operational Support for the WRF Infrastructure:** In a July 15th **letter** to NCEP Director Louis Uccellini, NCEP's Kevin Cooley and Stephen Lord concluded that NCEP Central Operations (NCO) could not operationally implement WRF in Sept 2005 on the NCEP North American domain (replacing the 12-km Eta) unless infrastructure supportability issues were resolved. In response, NCEP has committed to developing sufficient **in-house expertise to support the current WRF infrastructure** in operations by the end of FY05.
- **Streamlined Infrastructure Plans:** Meanwhile, the WRF Program Coordinator has solicited and received from the WRF partners their **requirements** for a streamlined infrastructure. Following distribution of the collated joint requirements, the WRF partner organizations will be invited to develop **preliminary designs** for a streamlined WRF software engineering infrastructure that would have greater code transparency, ESMF compatibility and be functionally suitable for use by operational centers. A **joint workshop** will be planned (target is late Autumn) for the WRF partners to develop a common design for the streamlined infrastructure.
- **Next release of WRF system code:** NCAR has been developing a new **WRF Version 2.03**, which includes grid nesting for the Advanced Research WRF (Eulerian Mass Core). In this version, the WRF-NMM Core is being updated and made "thread safe" for multi-processing. NCEP will undertake further coding and testing of the WRF-NMM in Autumn 2004. NCEP will re-write the NMM-SI and NMM-Real programs for version 2.03, beginning in October.
- **Rapid Refresh and Hurricane versions of WRF:** The PC is assisting FSL and NCEP with development of a plan for a future operational Rapid Refresh version of WRF, scheduled for implementation in FY07, that will replace the RUC model. Congress has announced that an extra \$3M is being provided to NOAA to ensure the development of the Hurricane version of WRF will be ready for operations in FY07.

2. WRF and DTC - OTC

- The Central DTC's planning for the **WRF Winter Forecast Experiment** continues with regular telecons held to finalize the choice of domains, model configurations, GRIB2 output standards, verification methods, product distribution, etc. Both WRF cores will be used during the experiment. NWS regions will assist in forecast evaluations.
- The Central DTC has hired a scientist-programmer who will **document WRF-NMM and support it to users**. The new hire is a foreign national and is currently seeking an entry **visa** for employment in the U.S.
- A **draft TOR** for the Distributed DTC has been written and circulated to FSL, NCAR and NRL/Monterey for comment.

3. WRF and COPC

- Program Coordinator participated in the **Fall meeting** of the Committee for Support and Backup (CSAB), which is the executive agent for COPC. The meeting was held in Silver Spring, 15-16 September, and explored reorganization of COPC support groups. The Program Coordinator reported on preliminary development of a **WRF Joint Implementation Plan**, as called for by COPC's Concept of Operations framework document.
- NRL and FNMOC have proposed developing a version of **COAMPS** having I/O interoperability and physics interoperability with WRF, but leaving the dynamic core outside the WRF infrastructure, partly due to funding constraints. **Navy has indicated its desire that this system be recognized as "WRF-COAMPS."** This request is driven primarily by the COPC Concept of Operations (CONOPS) framework that requires the three U.S. OPCs to implement WRF-based mesoscale prediction systems. The NRL/FNMOC plan raises two issues: (1) Does the proposed system **satisfy the CONOPS requirements?** (2) **What defines "WRF?"** (or What constitutes a modeling system that can be called "WRF?"). The Program Coordinator has discussed these issues with Navy, but so far no agreement has been reached. The Program Coordinator has requested that the first question be placed on COPC's fall-meeting agenda, and will work with the relevant WRF WGs, WRF Boards and the Program Office to address the second question in the form of recommendations to the WRF Executive Oversight Board.