

**Requirements for Maintenance, Enhancement and
Transition to Operations for the Rapid Refresh System
23 January 2007**

Generic requirements for Maintenance and Enhance (M&E) activities for the WRF Rapid Refresh (RR) system are as in the Attachment.

The RR system is composed of an hourly, cycled data assimilation, a model forecast and specialized output products to support the Aviation and Severe Weather operational applications. The RR system is one of the most demanding of NCEP's forecast systems due to the hourly delivery cycle and the short time available for job completion.

Due to the cycled data assimilation and model forecast components, the support requirements considerably exceed other NCEP operational systems that do not involve any data assimilation cycle (e.g. the Short-Range Ensemble Forecast (SREF) system). The RR cycle requires specialized software (e.g. a digital filter) and special treatment of hourly observations to produce acceptable results in operations. These specialized items increase the M&E requirements and make them different than other parts of the NCEP Production Suite, such as the North American Model (NAM) system. While basic tools for data assimilation may be provided for satellite data assimilation by the JCSDA and for general data assimilation applications by the NCEP Environmental Modeling Center (EMC), special tuning and differences in applications may force differences with other NCEP components and will increase the M&E costs beyond what EMC can afford. At this time, the JCSDA does not provide any support for assimilation of hourly satellite observations.

In the case of the RR with the Advanced Research WRF (ARW), NCEP EMC is not able to perform M&E support for the model or the data assimilation. Therefore, the providers of the RR must provide this M&E support.

In addition, since NCEP is migrating to an ESMF-based model, data assimilation and product generation infrastructure, which will house all NCEP operational systems except the RR, the organizations supporting the RR must transform the RR to operate in this infrastructure in a consistent manner as the remainder of NCEP's operational systems. A copy of the infrastructure is available upon request. A simple "wrapper" around a different infrastructure will not be acceptable to NCEP operations, since NCEP operations cannot, in the future, support multiple modeling infrastructures.