

Establishing a Functionally Similar Operational Environment for the Hourly-Updating NAM Forecast System: Current Status and Future Plans



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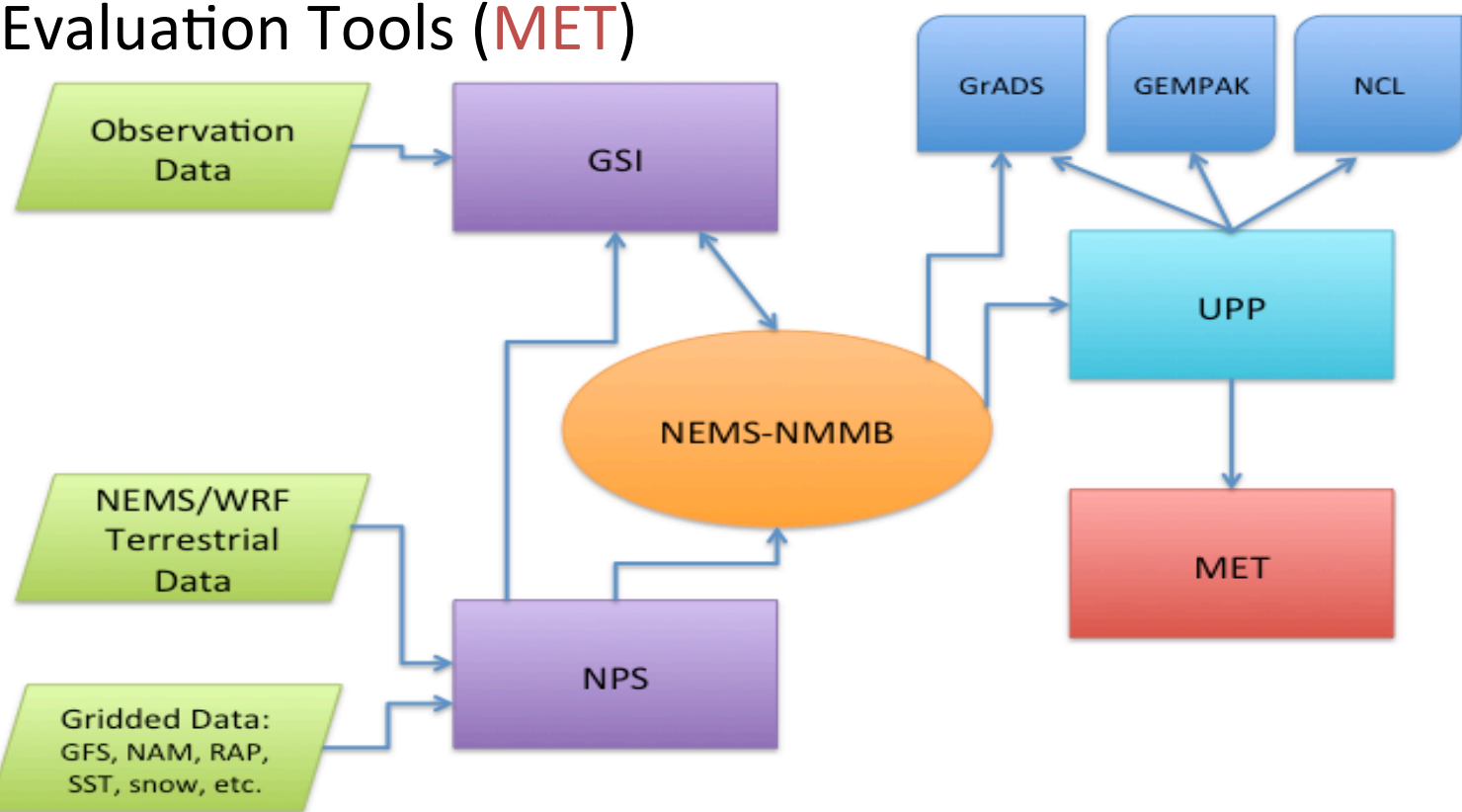
Motivation

As a *bridge between the research and operational* numerical weather prediction (NWP) communities, a fundamental purpose of the **Developmental Testbed Center (DTC)** is to *provide the research community access to functionally similar operational environments (O2R)*. Through this effort, promising new NWP *techniques from the research community may be transferred more efficiently to an operational environment (R2O)*.

Functionally Similar Operational Environment

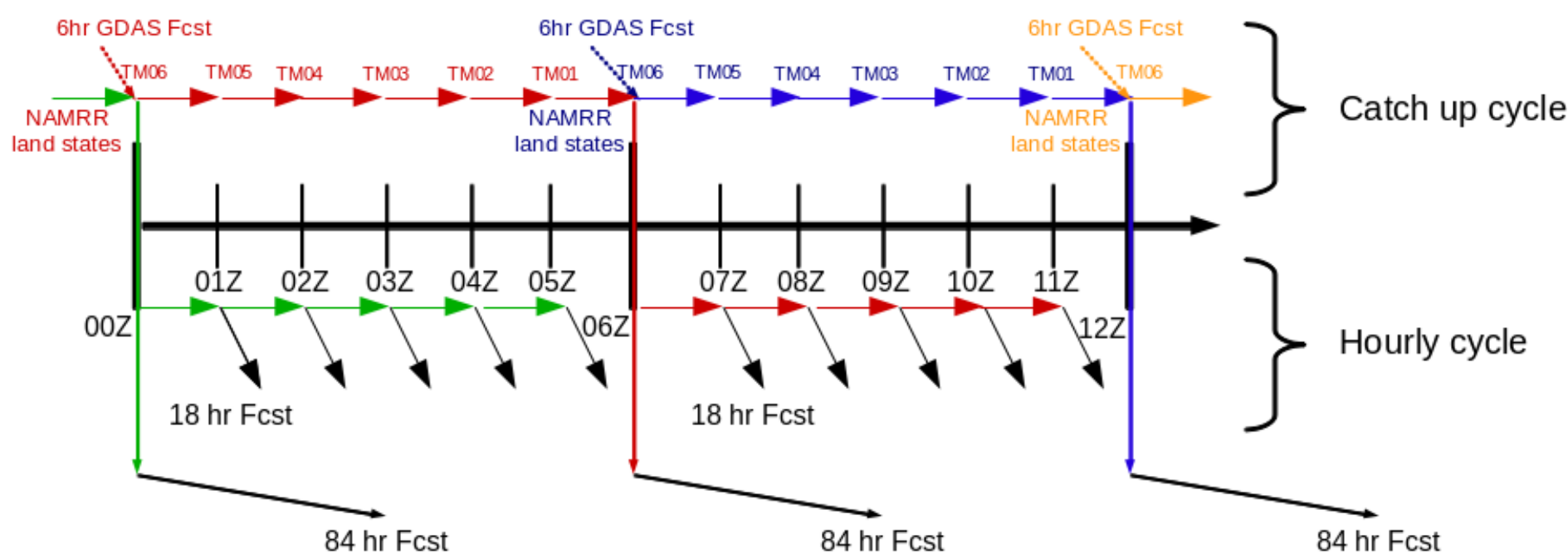
The components of the **functionally similar operational environment (FSOE)** for NAMRR include **officially distributed and supported systems** by the DTC (<http://www.dtcenter.org/code>):

- Gridpoint Statistical Interpolation (**GSI**) data assimilation
- NMMB Preprocessing System (**NPS**)
- NOAA's Environmental Modeling System Nonhydrostatic Multiscale Model on the B-grid (**NEMS-NMMB**)
- Unified Post Processor (**UPP**)
- Model Evaluation Tools (**MET**)



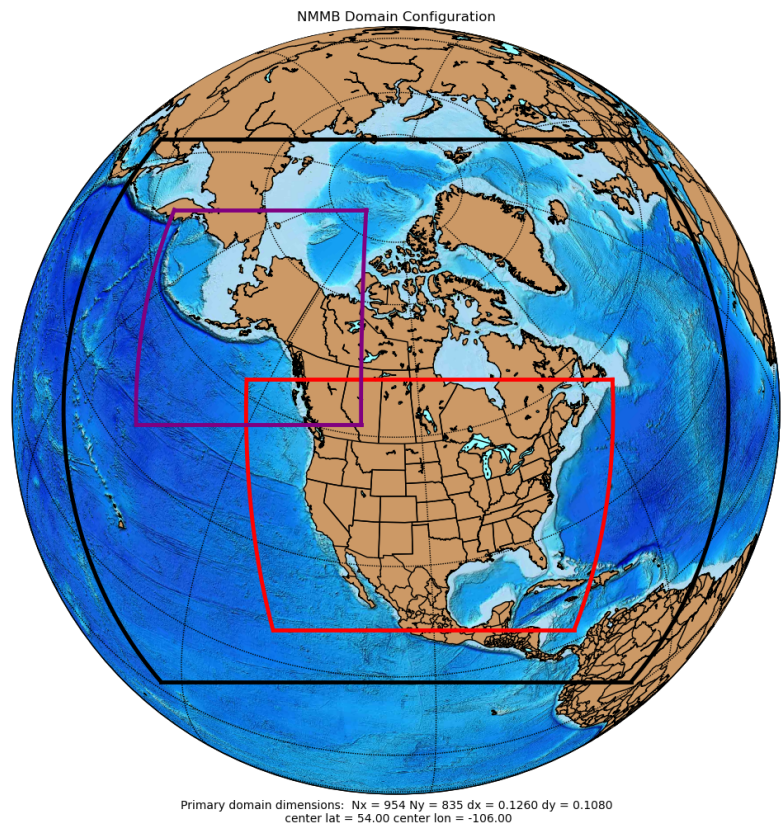
A **complementary effort** by the DTC to design and implement an infrastructure to facilitate running operational NWP suites (**NITE: NWP Information Technology Environment**) will **further enhance the O2R for NAMRR**. NITE will provide access to code, scripts, data, and workflows.

NAM Rapid Refresh (NAMRR)



NAMRR is based on the operational North American Mesoscale (NAM) forecast system and **includes**:

- Hourly updates
- Assimilation and cycling for the 12 km parent *and* 3 km nests
- 18-h forecasts every hour; 60-h (nests) and 84-h (parent) forecasts every 6 hours



NAMRR computational domains

Microphysics	Ferrier-Aligo
Radiation	RRTM
Surface Layer	MYJ
Land Surface Model	Noah
Planetary Boundary Layer	MYJ
Convection	BMJ (parent only)

NAMRR physics suite

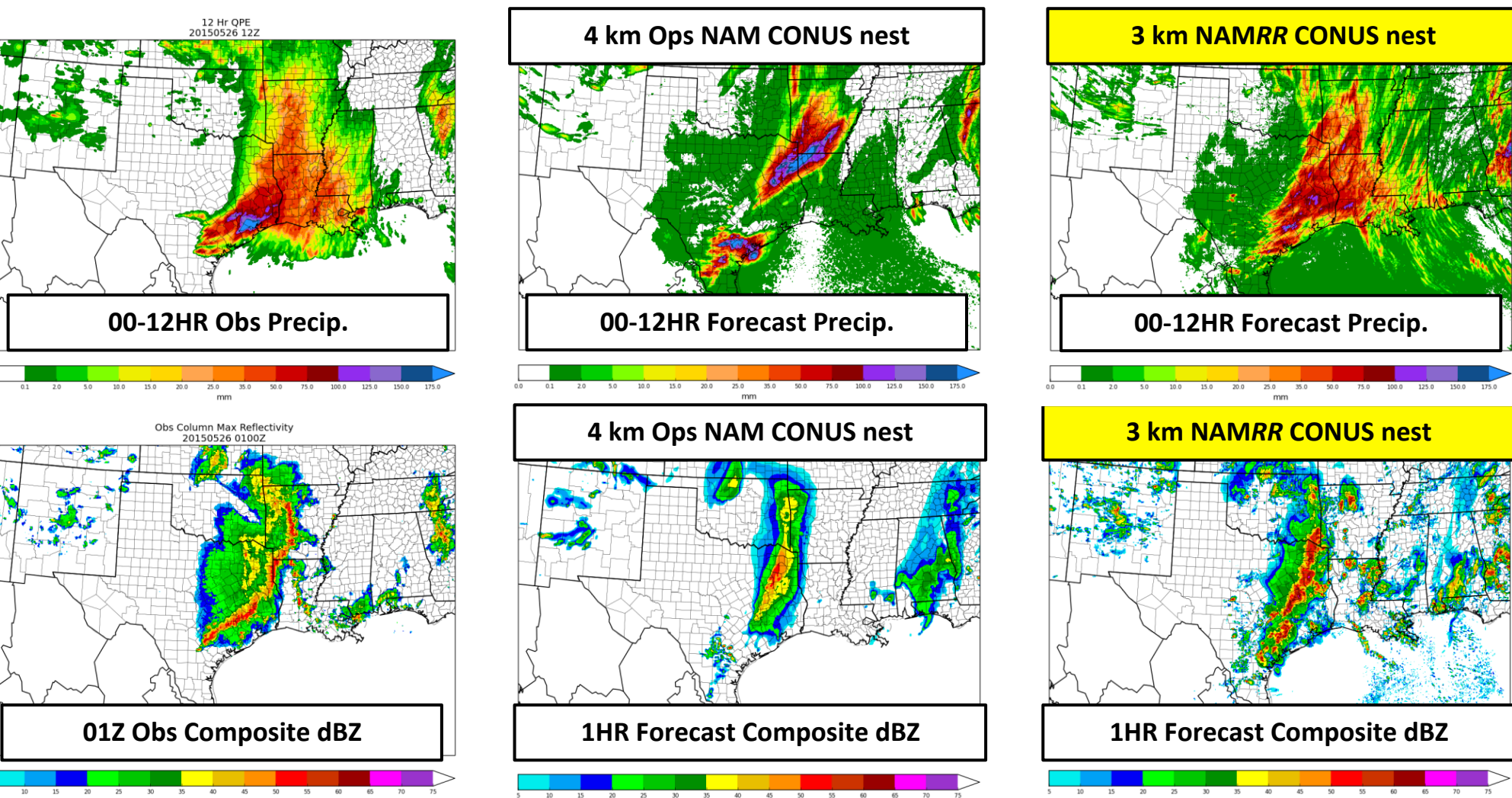
NAMRR will contribute membership to **future operational ensemble forecasting systems**, including:

- **Standard Resolution Ensemble Forecast (SREF)**
- **High Resolution Ensemble Forecast (HREF)**

along with the Rapid Refresh (**RAP**) and High Resolution Rapid Refresh (**HRRR**) systems, respectively, which are WRF-ARW based models

Case Example

26 May 2015 Extreme Precipitation Event in Houston, TX



NAMRR CONUS nest forecast significantly better

- Widespread large accumulations closer to observations over eastern TX, central AR, and much of LA
- While displaced to the West, simulated reflectivity at this time is more indicative of a severe squall line with isolated cells out ahead of the system

Key contributing factors for improved forecast include:

- Use of radar reflectivity in analysis
- Use of data assimilation for the CONUS nest

Summary

The NAMRR system has been ported to the DTC, which plans to provide support for a FSOE for NAMRR to the research community. In the future, through the infrastructure of NITE, researchers will be assured of running operationally relevant test suites for NAMRR.

Operational implementation of the NAMRR system at NCEP is planned for FY16.

Acknowledgments

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