

# NCEP Synergy Meeting Highlights: August 31, 2015

*This meeting was led by Mark Klein (WPC) and attended by Steven Earle (NCO); Mark Iredell, Vijay Tallapragada, and Geoff DiMego (EMC); Israel Jirak, Andy Dean, and Steve Weiss (SPC); Phil Shafer (MDL); Joe Sienkiewicz (OPC); Andy Edman (WR); Jeff Waldstreicher and Brian Miretsky (ER), Jason Taylor (NESDIS), and Brian Cosgrove (NWC).*

## 1. NOTES FROM NCO (Steven Earle)

Below is a summary of current and upcoming WCOSS evaluations/implementations:

HIRESW - Completed; briefing 9/4; Implementation 9/8

<http://www.nws.noaa.gov/os/notification/tin15-27hireswaab.htm>

GLMP - Ongoing; feedback by 9/15

RTOFS - Ongoing; feedback by 9/15

<http://www.nws.noaa.gov/os/notification/tin15-36global-rtofsaaa.htm>

SREF - Ongoing; feedback by 9/15

<http://www.nws.noaa.gov/os/notification/tin15-32srefaac.htm>

NAM MOS - Ongoing; feedback by 9/19

<http://www.nws.noaa.gov/os/notification/tin15-33nam.htm>

GFS MOS - Ongoing; feedback by 9/19

[http://www.nws.noaa.gov/os/notification/tin15-34gfs\\_mos1.htm](http://www.nws.noaa.gov/os/notification/tin15-34gfs_mos1.htm)

GTG - Ongoing; feedback by 9/23

ETSS - Ongoing; feedback by 9/29

<http://www.nws.noaa.gov/os/notification/tin15-39etss.htm>

GEFS - Ongoing; feedback by 9/30

Near Shore Wave Prediction (NWPS) - Evaluation to start in about 2 week

Air Quality Model (AQM) - Evaluation to start in about 2 weeks

Global Wave (multi\_1) - Evaluation to start in about 2 weeks

NOS OFS - Evaluation to start in about 3 weeks

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Discontinue ftp services - Cancelled

The TIN detailing the discontinuation of the NCEP ftp servers (ftpprd) has been cancelled due

inadequate performance.

## 2. NOTES FROM EMC

### ***2a. Global Climate and Weather Modeling Branch (GCWMB)***

#### GFS/GDAS:

Updates on FY16 GFS/GDAS implementation testing: Real-time parallels with the proposed GDAS/GFS upgrades (see details [here](#)) are continuing. Accumulated [verification statistics](#) suggest improvements in majority of the metrics compared to current operational GFS. However, a few issues related to summer time near-surface warm/dry biases were noted and reported by the users/field. In the last few weeks, we received several complaints of the GFS excessively heating particularly over the Great Plains. EMC MEG team and Land team examined several cases and found some possible causes include too much radiation (too little cloud), too much sensible heat and too little evaporation. The summer warm/dry biases were also found in the current operational GFS and were noticed in the previous parallel GFS before the January implementation as well. The biases mainly occur over the Great Plains where the cropland is dominated. Through some diagnoses and comparisons, it is found one of the main contributors to the bias is the soil moisture. The CFS/GLDAS soil moisture climatology is used to replace the Bucket climatology. Generally the new data has lower value in the east half of CONUS, which is closer to the observation. The change is good for winter and spring time when we noted cold temperature bias. However it is exaggerated the summer warm bias we already had before the bucket data was replaced. So we have to either increase the evaporation via reducing canopy resistance or decrease sensible heat flux with lower surface exchange coefficient. At that time we had extensively tested GFS with refined canopy resistance over cropland and grassland. The results showed significant improvement to the summer warm/dry biases (see presentation from FY15GFS evaluation [here](#)).

To address the warm/dry biases in the Northern Plains, we are now testing GFS with reduced canopy resistance over cropland/grassland. [Initial results](#) indicate significant reduction of biases in 2m temperature, dew point temperature and moisture fields. This change will be included in the retrospective parallels leading to operational implementation in Q2FY16.

#### GEFS:

FY16 Q1 GEFS Upgrades are planned to be implemented on October 13, 2015. NCO is running the 30-day parallel production test.

## **2b. Mesoscale Modeling Branch (MMB) (Geoff DiMego)**

**HiResWindow:** The restarted NCO 30 day stability test should be complete by the date of the Synergy Meeting. Subject to NCEP director approval, it will be implemented on September 8 barring unforeseen issues or an implementation date critical weather declaration.

**Parallel SREF:** Various fixes have been tested jointly by EMC and SPC to eliminate excessively high 2m dewpoint that were noticed by SPC. A final fix has been reached based on the investigations and evaluations and passed on to NCO. The 30-day evaluation has been restarted on Aug. 17 and implementation date has been set to Sept. 29. [There were spikes in the plume diagrams that SPC looks at and they are isolated in time with normal values appearing at the time before and the time after the spike. Spikes were most often associated with ARW members using MYNN pbl scheme and very occasionally with ARW members using MYJ pbl scheme. All members use Noah Land-surface model. A more physical approach will be investigated and implemented in the next SREF upgrade.]

A real-time CONUS parallel for the next RTMA/URMA upgrade bundle was started on 24 August featuring the analysis of MaxT/minT. Observation quality control will be enhanced in the coming days with the use of "varQC", which is quality control procedures built into the iterative solution of the variational analysis problem. Tests on known difficult situations have shown the varQC is batting around .500 which would be good for baseball, but not good enough for QC, which is why we are not planning to turn off all the other existing qc procedures in place in RTMA/URMA. The new terrain and land-use fields determined by consensus across CONUS are ready. They will replace the old fields from EMC in the downscaling of the first-guess for RTMA/URMA. The consensus fields will also be used in smartinit at the CONUS WFOs. A new URMA parallel for Alaska will also be started in the coming days. Although our original plan includes expanding the CONUS domain westward to enhance support for OPC and west-coast WFOs, as well as adding an analysis of cloud ceiling height, there is no guarantee that we will be able to finish that work in time for code hand-off to NCO planned for mid September. It should be noted that there seems to be very little chance to delay this upgrade package for even a couple of weeks and fulfil our original in its entirety. This upgrade is to provide maxT/minT fields to the highly visible "blender project", which **must** be implemented before the end of the calendar year.

Ying Lin reports for precip RTMA/URMA:

**RTMA:** use Stage IV hourly (except in NWRFC/CNRFC areas) as primary source of analysis when available, supplemented by Stage II hourly analysis (currently Stage II hourly is the sole source for RTMA)

**URMA:** re-fine the Stage IV mosaic process on where an RFC's data might be used outside of its domain of primary responsibility.

This is on track. Right now OHRFC is helping me with an updated RFC domains mask (Great Lakes are beginning to be covered by the adjacent RFCs). Plan to begin routine parallel run (in

my cron jobs) by 18 August and hand over code to NCO by 4 September.

**NAM upgrade** (Delivery of package to NCO, originally planned for mid-September, is delayed 2-3 months)

- Increase resolution of CONUS nest from 4 km to 3 km; CONUS nest output grid will be the same as that from the HRRR. 3 km nest has improved QPF bias over 4 km CONUS nest at higher thresholds.

- Increase resolution of Alaska nest from 6 km to 3 km

- Increase frequency in calls to model physics and for the 12 km parent, call the radiation scheme every 20 min instead of once an hour

- Physics changes (now being tested or under development; subject to change)

  - Convection changes (higher 12 km NAM QPF bias)

  - Removed "Dry" soil adjustment due to increasing warm bias as we moved into summer.

Cycled land states were restarted from ops NDAS on 2 August 2015. Investigations are ongoing to make a more "targeted" change for the cool season

  - PBL changes to address maritime shallow cloudiness

- Use of radar-derived temperature tendencies in model's diabatic digital filter initialization; call digital filter at start of NAM forecast (now only done at start of 3-h NDAS forecasts)

- Replace 3-h NDAS (12 km domain only) with hourly cycled system (NAMRR) with 12-km parent/3 km CONUS and 3 km Alaska nest; make 18h forecast of 12 km parent and 3 km CONUS/Alaska nest every hour; first step towards future convection-allowing ensemble (ARW members (i.e., 3 km HRRR) + NMMB members (3 km NAM nests)

- Resume use of AFWA snow depth product using envelope adjustment

- For CONUS/Alaska/Fire Weather nest: Land-sea mask changed to add all lakes resolved by the new fresh water lake (FLAKE) climatology. Water temperatures at "FLAKE" lake points are a blend using a Cressman analysis of the FLAKE climatology and temperatures at nearby water points resolved by the RTG\_SST\_HR analysis.

**RAP/HRRR** - code delivery to NCO now targeted for November with early 2016 implementation

- no changes in resolution but RAP domain will be expanded to nearly match that of NAM: will assist with future ensemble efforts

- RAP will be extended to at least forecast hour 21 and HRRR to at least forecast hour 18; final decisions not yet made

- primary focus of this implementation is to reduce the models' warm/dry bias via changes to land/sfc model, PBL scheme, convective parameterization (RAP), and GSI

- Hybrid data assimilation introduced to HRRR and weight of GFS ensemble increased in RAP

- New version of Thompson scheme now has aerosol-aware microphysics

**Air Quality** - 12 km NAM-CMAQ ozone and particulate matter predictions

- Code delivered to NCO with October 2016 implementation
- Improved anthropogenic emissions using the latest EPA National Emissions Inventory (NEI, 2011) with updates to current year based on DOE projections and NASA OMI satellite NOx trends
- Increased from 22 to 35 vertical levels
- Include NEMS Global Aerosol Capability (NGAC) particulates as lateral boundary conditions for CMAQ.
- Eventual improvements to wild-fire smoke emissions (see HYSPLIT below)

**Air Quality** - HYSPLIT dispersion model for smoke, dust, volcanic ash, chemical/radiological hazards

- Delayed to Q2 FY16 implementation (February, 2016).
- Update to HYSPLIT V7.4 with improved wet deposition especially important for chemical and radiological hazards
- Update to USFS BlueSky smoke emissions system V3.5.1 with improved representation of forest fire fuels for CONUS, Alaska and Hawaii. This upgrade will also be used to provide wild-fire smoke emissions into NAM-CMAQ.
- On-demand SDM Hysplit runs (volcanoes, RSMC, WFO/HAZMAT)
- Option to use all NCEP model outputs (incl. NAM nests)
- Transition static RSMC graphics web page to Operations (NCO)
- Transition volcanic ash trajectory graphics to MAG (NCO)
- Add trajectories for lake effect snow forecasts (WFO request)
- Improved Comprehensive Test Ban Treaty Organization (CTBTO)
- Back-tracking Google Earth KMZ graphics for SDM

### ***2c. Marine Modeling and Analysis Branch (MMAB)***

None

## **3. NATIONAL OCEAN SERVICE**

None

## **4. FEEDBACK FROM MDL/OPERATIONAL CENTERS/REGIONS**

### **4a. MDL**

- Implementations through October = GLAMP, GFS MOS station and gridded guidance, NAM MOS Regional Operator Equations, ETSS (see NCO notes above)

- National Blend of Models V1.0 (code delivery on track for 9/10/2015)

#### **4b. NCEP Centers**

- Weather Prediction Center (WPC):
  
- Storm Prediction Center (SPC):
  
- National Hurricane Center (NHC):
  
- Ocean Prediction Center (OPC):
  
- Aviation Weather Center (AWC):
  
- Climate Prediction Center (CPC):
  
- Space Weather Prediction Center (SWPC):

#### **4c. NWS Regions**

- Pacific Region (PR):
  
- Alaska Region (AR):
  
- Western Region (WR)
  
- Southern Region (SR):

- Central Region (CR): Would appreciate an update of Great Lakes WW3 upgrades including Ice Coverage and hourly updates. Also would like to see WW3 driven by NBM winds and run at least an hour earlier the present to accommodate the needs of Eastern Time offices. (*Robert Grumbine MMAB acting chief: The Great Lakes WW3 is working with GLERL and the National Ice Center to get improved ice coverage information for this coming winter. The model is capable of using ice information, but getting good enough observations are a challenge. Please contact me to discuss the other points.*)
- Eastern Region (ER):

## **5. National Water Center**

## **6. NESDIS**

GOES-R Update: NOAA, NASA and Lockheed Martin have identified schedule risks that have impacted the current launch date for GOES-R. After extensive review by NASA and Lockheed Martin, NOAA has decided it can best avoid these risks to the mission by moving the launch date from March 2016 and to pursue a potential launch slot in the fall 2016. NOAA will continue working with its partners to conduct thorough reviews of the GOES-R system and revise the satellite delivery schedule during the coming weeks.

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## **7. Offline Discussions**

**Topic:**

**Lead:**

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**The next Synergy Meeting is scheduled for Monday, September 28 at 2:30 pm EDT in NCWCP conference room 2890, with remote teleconferencing capability.**

Telecon: **1-866-763-1213**

Passcode: **524234#**

