

# NCEP Synergy Meeting Highlights: September 26, 2016

*This meeting was led by Mark Klein (WPC) and attended by Geoff DiMego (MMB); Shastri Paturi (MMAB); Israel Jirak and Andy Dean (SPC); Jim Nelson (WPC); Joe Sienkiewicz and Greg Seroka (OPC); Scott Scallion (MDL); John Eise (CR); Jeff Waldstreicher and Brian Miretsky (ER); Greg Patrick (SR); Curtis Alexander (ESRL); ; Bill Bua (COMET); and Jason Taylor (NESDIS).*

## 1. NOTES FROM NCO (Steven Earle)

- National Blend of Models (NBM), GFS-MOS and EKD-MOS... Science signed off on last week. IT stability test will restart this week. Target implementation is Nov 2.

<http://www.nws.noaa.gov/os/notification/tin16-33nbmv2aaa.htm>

<http://www.nws.noaa.gov/os/notification/tin16-31mosupgradeaab.htm>

<http://www.nws.noaa.gov/os/notification/tin16-32kdmosaaa.htm>

- Near-Shore Wave Prediction (NWPS): Technical stability 30-day test started on Friday, 9/23. No formal science evaluation for this upgrade, which includes the addition of WFOs. Target implementation is Oct 25

<http://www.nws.noaa.gov/os/notification/tin16-32kdmosaaa.htm>

- North American Mesoscale Forecast System (NAM): NCO received code and we're expected to start the evaluation in the beginning of November

## 2. NOTES FROM EMC

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

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

**NAM V4 September update : Delivered to NCO on 9 September; tentative implementation is in early January 2017**

- 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 for all domains; for the 12 km parent, call the radiation scheme every 20 min instead of once an hour
- Physics changes
  - Convection changes → higher (i.e., closer to one) 12 km NAM QPF bias, improved 12 km NAM equitable threat score during cool season .
  - Land surface model changed to increase canopy resistance, reduce plant transpiration, and reduce direct evaporation from frozen soil, targeting low 2m Td bias during cool season.
  - PBL changes to address maritime shallow cloudiness.
  - Radiation/microphysics changes to address 2m T warm bias during warm season.
  - 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 3h NDAS forecasts).
  - Replace 12-h NDAS with 3-h analysis/forecast updates for the 12 km domain with 6-h hourly assimilation "catch-up" cycle with hourly analysis updates for 12km parent/3 km CONUS and 3 km Alaska nest
  - Parallel NAM graphics for parent 12 km and 3 km CONUS/Alaska nests are at [www.emc.ncep.noaa.gov/mmb/mmbpll/namtest/nam/NAMX](http://www.emc.ncep.noaa.gov/mmb/mmbpll/namtest/nam/NAMX)
  - New observations assimilated :
    - i. New satellite winds:
      1. MTSAT2 IMAGER WVct AMVs (JMA)
      2. 254 54 M7 IMAGER WVct AMVs
      3. M10 IMAGER WVct AMVs
      4. NOAA 15 AVHRR IR AMVs
      5. NOAA 18 AVHRR IR AMVs
      6. NOAA 19 AVHRR IR AMVs
      7. METOPA AVHRR IR AMVs
      8. METOPB AVHRR IR AMVs
    - ii. New GPS Radio Occultation Data
      1. METOPB 3 (subtype)
    - iii. New Satellite radiance data
      1. M10 Seviri
      2. metopb hirs4, amsua, mhs, iasi
      3. npp atms, cris
      4. f17 ssmis
    - iv. Resume use of AFWA snow depth product using envelope adjustment
    - v. 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.
    - vi. Use NESDIS burned area data in the NAM fire weather nest. Two "accumulation" burned area files are used: 2-day and 30-day. The greenness fraction and albedo is adjusted according to the 30 day data and the top layer soil moisture according to the 2-day data

**RAPv3/HRRRv2** implemented 23 August 2016

- Extra forecast hours already flowing to AWIPS
- Sub-hourly (15 minute) data coming to AWIPS later this fall

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

### *Ocean Modelling:*

The global HYCOM upgrade is still on hold pending upgrade from Navy and will be simultaneously upgraded.

### *Wave modelling:*

The NWPS system has gone into parallel testing, scheduled to go into operations by the end of October. With this upgrade all the coastal WFO systems will be running in operations.

The Global wave system is being transitioned to the Cray (dealing with some technical issues). Together with the transition to Cray the system is being upgraded to extend the Arctic domain all the way to the North Pole. Testing is in progress and we hope to provide the codes to NCO with final implementation in FY17 Q2.

The Great Lakes system is being upgraded to using unstructured grids running at higher resolution and also having hourly forecasts. EMC parallels (on the Cray) are in progress and we are slated to transition codes to NCO in January with a target implementation in May

## **3. EARTH SYSTEM RESEARCH LAB** (*Curtis Alexander*)

- **RAPv4/HRRRv3 -- Development underway with data assimilation, model physics and numerics enhancements anticipated**
  - Scheduled implementation in February 2018
  - Improved sub-grid scale cloud representation and eddy diffusivity mass flux (PBL) for more accurate 2-m temperature, dewpoint and 10-m wind
  - Higher resolution land use data and variable greenness fraction (LSM)
  - Improved upper-level cloud forecasts with refined Thompson microphysics
  - New hybrid vertical coordinate system (sigma-pressure) for improved upper-level forecasts, especially near model terrain
  - More accurate terrain specification in the RAP with improved upper-level wind forecasts
  - Cycled HRRR forecasts using previous cycle forecast as first-guess in next cycle with improved retention and evolution of convection, especially in the first few forecast hours
  - Improved cloud analysis with consistent treatment of METAR and satellite

observations

- Storm-scale ensemble data assimilation in the HRRR for improved PBL and related convective forecasts
  - Storm-scale ensemble forecast?
  - Forecast extension to 39 (RAP)/36 hrs (HRRR) every 3 hours?
  - Larger CONUS HRRR domain?
  - HRRR Alaska?
  - Real-time experimental grids and graphics available at <http://rapidrefresh.noaa.gov/RAP/>
  - <http://rapidrefresh.noaa.gov/HRRR/>
- **HRRR Time-Lagged Ensemble (HRRR-TLE) -- Development continues with post-processing of HRRR forecasts into a time-lagged ensemble**
    - Scheduled IDP onboarding in 2018
    - Development of hourly-updating 0-24 hr probabilistic forecasts for heavy precipitation, winter weather, severe weather and aviation hazards using experimental HRRR as input
    - Bias corrected PQPF products for statistically reliable probabilities
    - Additional product calibration underway
    - Real-time experimental grids and graphics available at <http://rapidrefresh.noaa.gov/hrrrtle/>
- **HRRR Ensemble (HRRRE) -- Development continues with restart of sub-CONUS real-time experimental runs this fall 2016**
    - Use 40-member hourly-cycling 3-km data assimilation HRRR ensemble
    - Produce select member 12-24 hr forecasts every few hours
    - Plan to install radar reflectivity and cloud analysis data assimilation
    - Plan to install stochastic physics (parameter estimation, tendencies) for increased spread/skill
    - Real-time experimental grids and graphics available at <http://rapidrefresh.noaa.gov/HRRRE/>
- **HRRR-Alaska (HRRR-AK) -- Development continues**
    - Run once every three hours to 36 hrs over Alaska
    - Installed finer 15" MODIS land use dataset
    - Plan to assimilate radar reflectivity and lightning data after Oct 1 when MRMS feed for Alaska is established
    - Developing plan to assimilate cloud information from all-sky cameras for cloud analysis
    - Real-time experimental grids and graphics available at <http://rapidrefresh.noaa.gov/alaska/>
- **HRRR-Smoke -- Development continues for CONUS and Alaska smoke forecasts**
    - Run every six hours out to 36 hrs over CONUS and Alaska

- Produces smoke plume estimates from VIIRS fire data
- Plan to couple physics (radiation etc...) with prognostic smoke variables
- Real-time experimental grids and graphics available at <http://rapidrefresh.noaa.gov/HRRRsmoke/>
- <http://rapidrefresh.noaa.gov/HRRR-AKsmoke/>

#### 4. NATIONAL OCEAN SERVICE:

#### 5. FEEDBACK FROM MDL/OPERATIONAL CENTERS/REGIONS

##### 5a. MDL (Scott Scallion)

- NCO is currently working on GFS-MOS, GMOS, EKDMOS and NBM v2.0 (see NCO section above).
- Next MDL code handoff will be ECMWF-MOS, (new code delivery due to Cray troubleshooting delays = 9/30/2016, previously targeted late November implementation will be pushed back), upgrade includes:
  - Generate first generation ECMWF MOS station-based snowfall guidance for the CONUS and Alaska
  - Generate METAR station-based 10m wind gust guidance
  - Update ECMWF MOS METAR station-based 2m temperature, 2m dewpoint, MaxT, MinT
  - Potential timing change of Ensemble MOS product delivery
- MDL is working with Tom Hamill (OAR) on an update (v2.1) to the NBM PoP12/QPF guidance (code delivery = late Oct, target for implementation = late winter/spring 2017). Tom briefed the NBM PoP12/QPF guidance during the WCOSS Science Quarterly July 29th.
- Gridded LAMP HRRR-MELD for Ceiling Height and Visibility is scheduled to be handed off at the end of November and implemented early late FY17Q2 or early FY17Q3

##### 5b. NCEP Centers

- Weather Prediction Center (WPC):
  - 2017 Winter Weather Experiment
    - *Tentatively* set for 4 weeks
      - Jan 17-20 (remote)
      - Jan 30 - Feb 3
      - Feb 6-10

- Feb 13-17

- Due to the travel cap, WPC can support paying for only one participant per Region.

- 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):

### **5c. NWS Regions**

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

- Central Region (CR): 9/19/2016 JPC. **KUDOS!** Wanted to thank everyone for the HRRR/RAP upgrade. The extra 3 forecast hours on HRRR and RAP were flowing on SBN into AWIPS immediately. Well done. Thank you.
- Eastern Region (ER):

## **6. Office of Water Prediction (formerly National Water Center)**

- National Water Model (Version 1.0) successfully implemented into operations on WCOSS Cray on August 16th
- Data access strategies for WFOs beyond water.noaa.gov are currently being assessed through HQ/Field partnership

## **7. NESDIS**

**GOES-13 (GOES-East) Returning to Two Star Tracker Attitude Configuration on September 26, 2016:** A GOES-13 Star Tracker 3 (ST3) anomaly occurred on August 30, 2016 and the investigation team has determined that ST3 is non-recoverable. GOES Engineering will power on Star Tracker 2 (ST2) and transition to ST1-ST2 attitude control configuration for GOES-13 on September 26, 2016. ST2 will be turned on at around 1620 UTC and two-tracker attitude configuration operation will start at around 1800 UTC. Users may experience some degradation of GOES-East products for approximately 30 hours until Image Navigation and Registration (INR) performance has returned to specification. The period of INR impact will be 1630 UTC on September 26, 2016 to 2230 UTC on September 27, 2016. No image will be cancelled for this operation (Jason Taylor, 301-683-3248).

### **User Re-Validation for ESPC Data Distribution**

All external DDS users who have not already been working with the PDA Integration team and all GeoDist users who will want access to GOES-R data will need to revalidate. Users who do not submit their re-validation forms by September 30, 2016 will not be included in upcoming new user training. PDA is now expected to be operational around the end of the year with NDE and NPP data available. Transition of re-validated users and products from DDS is expected to

take about 6 months after PDA is operational, at which time DDS will be turned off. GOES-R data will be available on PDA after check-out period is complete. This is expected about 6 months after launch, which is currently scheduled for November 4, 2016 (Donna McNamara, 301-817-3803).

**Jason-3 GDRs:** CNES has begun generating Jason-3 Geophysical Data Records (GDRs), which are the fully validated products that use a precise orbit and the best environmental/geophysical corrections. These products are available per repeat cycle with a latency of 60 days. Validation is performed by two teams at CNES and NASA/JPL to ensure in depth validation. Cycles 000 through 003 have been flowed to the Comprehensive Large Array-data Stewardship System (CLASS) and additional cycles are being archived as each initial cal/val is completed. For now, the GDRs are only being flowed to CLASS with access level-3, making them available to the Ocean Surface Topography Science Team (OSTST) and Project ONLY; and not yet fit for public release. GDRs will start being sent to the National Centers for Environmental Information (NCEI) once they are 'blessed' for public release by the OSTST at the final verification workshop, coincident with this year's OSTST meeting, the first week of November. (David Donahue, 301-683-3236)

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## **8. Offline Discussions**

**Topic:**

**Lead:**

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**The next Synergy Meeting is scheduled for Monday, October 31 at 2:30 pm EDT in NCWCP conference room 2890, with remote teleconferencing capability.**

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

**Passcode: 524234#**