

NCEP Synergy Meeting Highlights: July 25, 2016

This meeting was led by Mark Klein (WPC) and attended by Steven Earle (NCO); Vijay Tallapragada (EMC); Eric Rodgers (MMB); Shastri Paturi (MMAB); Israel Jirak (SPC); Dave Myrick (MDL); John Eise, Jeff Craven and Jeff Manion (CR); Jeff Waldstreicher (ER); Curtis Alexander (ESRL); ; Bill Bua (COMET); Jason Taylor (NESDIS); and Brian Cosgrove and Mark Fresch (OWP).

1. NOTES FROM NCO (Steven Earle)

RTMA/URMA v2.4.1 - NCEP Director briefing scheduled for August 19. Please let me know if you'd like to attend. Implementation planned for August 23

http://www.nws.noaa.gov/om/notification/tin16-27rtma_urma_sref.htm

RAPv3/HRRRv2 - NCEP Director briefing scheduled for August 19. Please let me know if you'd like to attend. Implementation planned for August 23

http://www.nws.noaa.gov/om/notification/tin16-26rap_hrrrr.htm

NAM-MOS - NCEP Director briefing scheduled for August 12. Please let me know if you'd like to attend. Implementation planned for August 16

<http://www.nws.noaa.gov/om/notification/tin16-15namaaa.htm>

National Water Model - NCEP Director briefing was completed on July 19 and the model was improved for implementation. Implementation planned for August 16. TIN will be coming soon.

Geospace (SWMF) - 30-day stability test will be restarted. Implementation expected in early September.

National Blend of Models, GFS-MOS and EKDMOS - Evaluation planned for August... Implementation on target for September.

Near-Shore Wave Prediction System - Evaluation planned for September. Implementation on target for October.

Global RTOFS - Currently delayed due to a delay with the Navy upgrade. Implementation is TBD.

2. NOTES FROM EMC

2a. Global Climate and Weather Modeling Branch (GCWMB) (Vijay Tallapragada):

Planning started for Q3FY17 GFS (NEMS/GSM) upgrades.

Potential upgrades:

- Upgrade software infrastructure to NEMS
- Update Rayleigh damping and divergence damping to improve forecast in the upper stratosphere
- Add to NCEPPOST the computation of vertical velocity using gridded data as input.
- Distribute $\frac{1}{8}$ deg output
- Implement NSST (Near-Surface Sea Temperature) for both GDAS and GFS
- Implement scale- & aerosol-aware deep & shallow convection schemes with convective cloudiness enhancement
- Implement TKE-based moist EDMF PBL scheme
- Use high resolution(1km) IGBP vegetation and STASGO soil type data to replace current coarse resolution (1 degree) UMD/Zolber; use high resolution MODIS snow and snow free albedo; add decoupling prevention to address the rapid temperature drop during sunset; use standalone GLDAS forced by observed precipitation to provide initial land states to GSM.
- Using 15% as a cutoff for sea ice concentration to represent sea ice cover
- Use new USGS GMTED2010 terrain data, which is the replacement for the USGS GTOPO30 data

Retrospective & Real-time Parallels:

- Not a major upgrade (no changes to model resolution or DA)
- Retrospective and Real-time Parallels will cover the period from May 2015 to May 2017 (two summers and two winters)
- Lot of downstream and upstream changes required due to NEMSIO upgrade.

Evaluation Strategy:

- The global group is looking forward to working with the forecaster community on evaluating this implementation
- Will start early on the case-studies and field engagement
- What do forecasters want? Let GCWMB know by early August.

2b. Mesoscale Modeling Branch (MMB) (Representative from MMB)

NAM V4 upgrade

July 2016 update : Code delivery to NCO at the end of August, targeting late

November-early December 2016 implementation Joaquin failures in place and being tested. The hourly NAMRR 18-h forecast component of the NAM V4 will not be included in the operational implementation of this upgrade.

- 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 (now being tested or under development; subject to change)
 - 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 updates for the 12 km parent domain with a 6-h assimilation “catch-up” cycle with hourly analysis updates for 12km parent/3 km CONUS nest/3 km Alaska nest
 - Links to parallel NAM web pages can be found at <http://www.emc.ncep.noaa.gov/mmb/mmbpll/eric.html#TAB2>
 - 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

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

- Near-shore ready for the West Coast.
- RTOFS still waiting for Navy files.
- Great Lakes Wave models - hourly updates expected in Spring 2017.

3. EARTH SYSTEM RESEARCH LAB

RAPv4/HRRRv2 30-day evaluation underway (ends Aug 14)

(1) GRIDS: The NCEP RAPv3/HRRRv2 parallel GRIB2 grids are available at:

<http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/rap/para>
<http://para.nomads.ncep.noaa.gov/pub/data/nccf/com/hrrr/para>

(2) WEB GRAPHICS: The NCEP RAPv3/HRRRv2 parallel web graphics are available at:

<http://mageval.ncep.noaa.gov/model-guidance-model-parameter.php?group=Model%20>

[Guidance&model=RAP&area=NAMER&ps=area](#)

<http://mageval.ncep.noaa.gov/model-guidance-model-parameter.php?group=Model%20Guidance&model=HRRR&area=CONUS&ps=area>

Additional web graphics produced from ESRL (not 24/7 availability) for the NCEP RAPv3/HRRRv2 are available from:

http://rapidrefresh.noaa.gov/RAP/Welcome.cgi?dsKey=rapv3nco_jet

http://rapidrefresh.noaa.gov/HRRR/Welcome.cgi?dsKey=hrrrv2nco_jet

(3) INFORMATION: The technical information notice (TIN) related to the underlying science and output changes between the operational RAPv2 and the parallel RAPv3 along with the operational HRRRv1 and the parallel HRRRv2 are contained in the document:

http://www.nws.noaa.gov/os/notification/tin16-26rap_hrrrr.htm

RAPv4/HRRRv3 updates will be installed in the ESRL RAP/HRRR by Sept 2016

4. NATIONAL OCEAN SERVICE (*No Representative*):

5. FEEDBACK FROM MDL/OPERATIONAL CENTERS/REGIONS

5a. MDL

- NCO is currently working NAM-MOS, GFS-MOS, GMOS, EKDMOS and NBM v2.0 (see NCO section above).
- Next MDL code handoff will be ECMWF-MOS (code delivery = 8/9/2016, target for implementation = 11/22/2016), upgrade includes:
 - Generate first generation ECMWF MOS station-based snowfall guidance for the CONUS and Alaska
 - Generate METAR station-based 10-m wind gust guidance
 - Update ECMWF MOS METAR station-based 2-m temperature, 2-m dewpoint, MaxT, MinT
- MDL is working with Tom Hamill (OAR) on an update (v2.1) to the NBM PoP12/QPF guidance (code delivery = late Aug, target for implementation = mid

Jan. 2017). Tom will be providing a briefing on the NBM PoP12/QPF guidance during the WCOSS Science Quarterly this Friday (July 29th).

- Experimental updated LAMP convection guidance:
 - MDL is producing experimental updated LAMP convection guidance which uses HRRR, MRMS, and Total Lightning inputs. The guidance covers a 25-hour period and indicates the probability and potential of the occurrence of at least one lightning strike and/or radar reflectivity of at least 40 dBZ in a 20-km gridbox over a 1 hour period.
 - Currently the guidance is produced every 3 hours, but will soon be produced every hour.
 - The URL for the graphics can be found here:
<http://www.nws.noaa.gov/mdl/lamp/cnv1h.php>
 - Note that the web site is not supported 24x7, and is subject to data outages when the WCOSS development computer is unavailable.
 - This data will be available for evaluation at the AWC Summer Experiment.

5b. 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):

5c. NWS Regions

- Pacific Region (PR):

- Alaska Region (AR):

- Western Region (WR)
 - **EC/GFS Ensemble spaghetti page** -- any update on making this a more operationally supported page -- field great appreciates page - provides valuable use to forecasters

EMC will look into transferring this web page into its operations.
 - **GFS Ensemble issue** -- status update: Cold bias in legacy GFS ensemble near lake Tahoe -- Issue raised by Sacramento RFC

EMC is monitoring this cold bias and will contact the Sacramento RFC when a resolution has been determined

- Southern Region (SR):

- Central Region (CR):
 - Looking for a status update on the operational running of **HREF** and when it will be on SBN? This is our #1 NWP need. We have been delaying regional efforts to expand use of HRRR Time-Lagged ensembles in CONSShort and SuperBlend because of the coming of HREF.

Steven Earle from NCO forwarded this request to NCO's Becky Cosgrove
 - This discussion is relevant to more than modeling on the Great Lakes. It applies to all local modeling efforts and the idea that everything will run at WCOSS by EMC/NCO. **WW3/GLWM**: In

order to expedite turning off local models at WFOs like GLERL Wave Model, we bought into the EMC/NCO run Great Lakes Wave Model, which is run every 6 hours. We even got the CR NWSEO/RLC involved and promised in Fall of 2015 there would be hourly runs of the Great Lakes Wave Model in order to support updates. I now see that the WW3 hourly runs have been delayed for another year. We are trying to be team players by not running local models and not having locally managed innovation get in the way. I have trouble getting local WFO buy-in to the concept of running models at the national level when it takes years to implement.

Answer from MMAB: The upgrade to the hourly runs from the current 6 hourly runs was also being used to concurrently increase the resolution of the system as well as an upgrade to the ice input in the wave model. At the same time NCO is also upgrading to the Cray system. With all of these changes coming in, we needed more time to test the capability of the operational system. The upgraded system was delayed till Spring so that we would have a full season of ice input this year to make sure that there are no problems when we go into operations. The EMC parallel will begin much before that and we will be in touch with the Central Region so that the WFOs can test the system. We are increasing resolutions to provide additional value added products like rip current warnings - a project for which we are coordinating with the NOAA Office of Science & Technology. Upgrading the Great Lakes operational system is a high priority for us and we are expecting no further delays

- **Sub 1km resolutions for complex terrain and urban meteorology/IDSS.** Now that we are routinely running operational models at 3-4km, we need to turn our attention on downscaling. For many years we took 12-40km models and downscaled them locally to about 4km. Now, we need to take the next step and take the 3km HRRR and downscale on the order of 100 meters and 5 minutes, at least for small domains near urban areas. Ideally this would be on demand situations similar to our NAM 1.33km Fire Weather Nest except it would need to be far less restrictive (IOW, from June 15 to Sept 15th only the NIFC in Boise has control of the NAM Fire Weather Nest. We need to make sure that this is something we are planning for in the very near future.

EMC response: No known plans for downscaling to sub-1km currently exist

- Eastern Region (ER):

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

- The NWM science evaluation period has ended, and the implementation briefing was held July 29th. The 30-day IT stability test ends on August 5th, with implementation planned for August 16th.
- Question for EMC: What is the status of GEFSv12 planning; for example, has the configuration been determined?

EMC's Kate (Xiaqiong) Zhou is doing a lot of tests with different resolution and membership settings under Yuejian's guidance, while a final decision about the configuration has not been reached yet.

7. NESDIS

Jason-3 Products Operational: On June 24, 2016, the Jason-3 Near Real-Time Verification Workshop's recommendations were distributed to the Joint Steering Group members from NOAA, NASA, EUMETSAT and CNES (French Space Agency) who unanimously endorsed the advice. At approximately 1420Z on June 30 distribution of Jason-3 World Meteorological Organization (WMO) BUFR files to the National Weather Service Telecommunication Gateway (NWSTG) was enabled. Soon after, distribution to all operational users was established. The OGDRs (Operational Geophysical Data Records) are sea surface height, significant wave height, and altimeter wind speed products that are delivered to operational ocean modelers and ocean prediction centers, typically within 2.5 hours from observation, to enable safe maritime navigation. Jason-3 is now the primary reference mission and Jason-2 remains on track to be moved to an interleaved orbit in mid-September, pending the decision of a Jason-2 Joint Steering Group to be held sometime this summer. (David Donahue, 301-683- 3236)

8. Offline Discussions

Topic:

Lead:

The next Synergy Meeting is scheduled for Monday, September 26 at 2:30 pm EDT in NCWCP conference room 2890, with remote teleconferencing capability.

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

Passcode: **524234#**