

NCEP Synergy Meeting Highlights: November 28, 2016

This meeting was led by Mark Klein (WPC) and attended by Steven Earle (NCO); Eric Rogers (MMB); Glenn White (GCWMB); Shastri Paturi (MMAB); Israel Jirak and Andy Dean (SPC); Mike Brennan (NHC); Scott Scallion (MDL); Jeff Waldstreicher (ER); Jack Settelmaier (SR); Curtis Alexander (ESRL); ; Bill Bua (COMET); Brian Cosgrove (OWP); and Jason Taylor (NESDIS).

1. NOTES FROM NCO (*Steven Earle*)

NAM - Expected to start 30-day evaluation at the end of this week (11/28). Data is already available for an early look:

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

Blend - NCO received code delivery but is on hold due to other MDL priorities

ECMWF-MOS - NCO received code delivery but is on hold due to other MDL priorities

2. NOTES FROM EMC

2a. Global Climate and Weather Modeling Branch (GCWMB) (Glenn White):

- 1) New dynamic core FV3 under active development
- 2) GFS2017 real time and retrospectives well underway
Summer 2014 and May 2015-May 2017.

The experimental GFS would implement:

- a. the NEMS software superstructure and infrastructure,
- b. upgraded land parameterizations and updated, higher resolution land surface climatologies that should improve near-surface fields and reduce patchiness seen in some cases,
- c. a fix to excessive cooling of 2m temperature during sunset,
- d. changes to cumulus convection parameterization that is expected to improve summertime precipitation forecasts,
- e. Near-Sea Surface Temperature that describes oceanic vertical temperature structure near surface due to diurnal warming and sub-layer cooling physics processes and that will improve SST, data assimilation and tropical weather forecasts,

- f. Rayleigh damping reduced by 50% in the upper stratosphere, and
- g. Assimilation of additional data and preparation for future satellites.

Changes will impact near surface fields, precipitation and sea surface temperature and related fields.

Web page for GFS2017:

<http://www.emc.ncep.noaa.gov/gmb/noor/GFS2017/GFS2017.htm>

Verification pages listed including near surface fields.

Real time parallel will be available via:

Western region website for side by side maps of GFS and GFSX:

<http://ssd.wrh.noaa.gov/gfs/html/>

NCO Mageval page <http://mageval.ncep.noaa.gov/>

Hope to have 20 km, half degree files available on paraNOMADS.

Still some problems with data flow. Parallel sometimes may be substantially later than operational.

Synoptic maps, precipitation maps available at

http://www.emc.ncep.noaa.gov/gmb/STATS_vsdb/

GFS vs GFSX plume diagrams

<http://www.emc.ncep.noaa.gov/mmb/cguastini/gfsx/EMCGFSXplumes.html>

1 degree data available on WCOSS for real time and retrospectives.

Mark Klein working on VLAB forum on GFSX performance.

Tracey Dorian working on case studies submitted by NCEP centers, NWS regional headquarters, WFOs. More case studies welcome.

First impressions: precip skill over CONUS seems significantly improved.

MEG review of verification so far of GFSX December 1

Deadline for evaluation : Jan. 31, 2017.

2b. Mesoscale Modeling Branch (MMB) (Eric Rogers)

- 1) NAM V4 November update : NCO now routinely running NAM parallel in real-time and all EMC verification/web pages now pointing to NCO parallel run. Tentative implementation is January 10, 2017
- 2) DGEX (along with some NAM products) is slated to be shut off at the same time

as the NAMv4 is implemented as was noted in PNS 16-34 (http://www.nws.noaa.gov/os/notification/pns16-34nam_removal.htm)

- 3) 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.
- 4) Increase resolution of Alaska nest from 6 km to 3 km
- 5) 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
- 6) 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
 - 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).

Ocean Modelling: A phaseout of RTOFS Atlantic has been planned, with a subsequent upgrade for RTOFS Global.

Wave modelling: The Nearshore Wave Prediction System is fully operational. An upgrade for the Great Lakes is planned for summer 2017, with relevant codes to be delivered in January 2017.

3. EARTH SYSTEM RESEARCH LAB (Curtis Alexander)

Operational RAPv3/HRRRv2

14z 02 November 2016

- Fix for wind gust diagnostic to remove high speed bias at night (impacting RTMA)
- Fix for the f03hr 10 m average wind and solar radiation values

Experimental RAPv4/HRRRv3 development

April 2017 code freeze for experimental real-time runs

June 2017 code delivery to EMC

February 2018 scheduled implementation

Priorities pending science evaluations and computer resource availability:

- Storm-scale ensemble data-assimilation for HRRR (hourly)
- Deterministic HRRR forecast length extension to 36 hrs (at least every 6 hrs)
- OCONUS domains (Alaska, Hawaii, Puerto Rico at most every 3 hrs)
- Storm-scale ensemble forecasts to 18+ hrs (at most every 3 hrs)
- CONUS HRRR domain expansion to NDFD grid

4. NATIONAL OCEAN SERVICE (No Representative):

5. FEEDBACK FROM MDL/OPERATIONAL CENTERS/REGIONS

5a. MDL (*Scott Scallion*)

- GFS-MOS, EKD-MOS, and National Blend of Models were implemented 11/15/16.
- ECMWF-MOS handoff to NCO on 10/7/16 for updated temperature equations and new snowfall forecasts
 - The updated model does not seem to have a negative impact on the MOS, but please let us know if you notice anything concerning.
 - http://www.mdl.nws.noaa.gov/~ecmwf/moscomp_eval.php (experimental site, NOAA internal only)
- MDL worked with Tom Hamill (OAR) on an update (v2.1) to the NBM PoP12/QPF guidance that was handed off 11/16/16.
 - Tom briefed the NBM PoP12/QPF guidance during the WCOSS Science Quarterly July 29th.
 - <https://veritas.nws.noaa.gov/blend/conus.php>
 - NOAA LDAP Credentials
 - See PoP12 and QPF06 under “Blend Parallel”.
 - https://veritas.nws.noaa.gov/blend/doc_material/UserDoc.html
- LAMP/Gridded LAMP
 - MDL is now producing hourly experimental updated LAMP convection and lightning guidance which uses HRRR, MRMS, and Total Lightning inputs and which covers 1-hr valid periods instead of the current operational 2-hr valid periods. The guidance covers a 25-hour period and indicates the probability and potential of the occurrence of the event. For convection, the event is defined to be at least one total lightning strike and/or radar reflectivity of at least 40 dBZ in a 20-km gridbox over a 1 hour period. For lightning, the event is defined to be at least one total lightning strike in a 20-km gridbox over a 1-hr period.
(<http://www.nws.noaa.gov/mdl/lamp/cnv1h.php>)
 - In addition, we continue to produce experimental LAMP/HRRR "Meld" gridded forecasts of ceiling and visibility.
(http://www.mdl.nws.noaa.gov/~rlamp/gimp_expr_viewer_meld.php) - Requires LDAP credentials
Soon to be available to public at:
http://www.weather.gov/mdl/lamp_experimental
 - These products are planned to be handed off soon and implemented into NWS operations in late March of 2017.

5b. NCEP Centers

- Weather Prediction Center (WPC):
 - 2017 Winter Weather Experiment
 - 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):

No question from WR. Looking forward to NCEP annual meeting discussions on future direction

- Southern Region (SR):

- Central Region (CR): No questions from CR.

- Eastern Region (ER):

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

- 30-day science evaluation of NWM V1.1 will start this week

7. NESDIS

GOES-R (GOES-16) Launched Successfully:

On Saturday, November 19, 2016 at 6:42 PM ET a United Launch Alliance Atlas V launch vehicle carried GOES-R to space. Following lift off, the spacecraft successfully separated from the upper stage, and completed its first stage solar array deployment, allowing the instruments to get power from the sun. Communication with the satellite is now established and the GOES-R team continues to move the spacecraft toward geostationary orbit. GOES-R will scan the skies five times faster than today's GOES spacecraft, with four times greater image resolution and three times the spectral channels. It will provide high-resolution, rapid-refresh satellite imagery as often as every 30 seconds, allowing for a more detailed look at a storm to determine whether it is growing or decaying. Furthermore, GOES-R data will help improve hurricane tracking and intensity forecasts, the prediction and warnings of severe weather, including tornadoes and thunderstorms. Additionally, GOES-R's improved rainfall estimates will

lead to more timely and accurate flood warnings.

Resumption of Jason-2 Sea Surface Height Anomalies as input to the Satellite Ocean Heat Content Suite: The Jason-2 Satellite left its repetitive exact repeat orbit October 2 and completed its transfer to the interleaved orbit on October 13. From October 2 to November 8 there had been no new Jason-2 Sea Surface Height Anomalies (SSHAs) available from the Naval Oceanographic Office (NAVO) over the Data Acquisition Processing and Exchange (DAPE) as input in the generation of the operational Satellite Ocean Heat Content (OHC) Suite of products, as NAVO was updating its Jason-2 Sea Surface Height Anomaly (SSHa) software for the interleaved orbit. On November 8, NAVO began transmitting operational Jason-2 SSHa interleaved products over the DAPE and, as of November 9, they are again available as input to the generation of the operational Satellite Ocean Heat Content (OHC) Suite of products, which also uses SSHAs from SARAL/AltiKa and Cryosat-2. (David Donahue, 301-683-3236)

The Impact on ATOVS (Advanced Tiros Operational Vertical Sounder) of the Metop-B Advanced Microwave Sounding Unit (AMSU-A) channel-15 anomaly: On November 2, 2016 a solution was tested and implemented to mitigate the impact of the AMSU-A channel-15 anomaly on ATOVS sounding data processing. The AMSU-A Channel-15 on Metop-B satellite failed around 02 UTC, October 17, 2016 causing a degradation of all ATOVS sounding data products. Users were notified about the degradation. An impact assessment indicates that a mitigation solution has restored the ATOVS sounding data products quality. The first orbit with recovery of ATOVS on Metop-B started on November 02, 2016 at 1538Z. (Dr. Awdhesh Sharma, 301-683-3229)

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

Telecon: **1-866-763-1213**
Passcode: **524234#**