NCEP Synergy Meeting Highlights: September 25, 2017

This meeting was led by Mark Klein (WPC) and attended by Steven Earle (NCO); Glenn White and Eric Rogers (EMC); Israel Jirak, Steve Weiss and Andy Dean (SPC); Scott Scallion and Jeff Craven (MDL), and Brian Cosgrove (OWP).

1. NOTES FROM NCO (*Steven Earle)*

RTMA/URMA - Undergoing 30-day stability test, which was restarted October 6. Implementation scheduled for November 14.
http://www.nws.noaa.gov/os/notification/scn17-105rtma_urma_nam.htm

SWMF (Internal SWPC only!) - Undergoing 30-day stability test until October 21. Implementation scheduled for October 31

HiResW/HREF - Undergoing 30-day stability test until October 21. Implementation scheduled for November 1

LMP/GLMP - Undergoing 30-day stability test until October 24. Implementation scheduled for November 2

NWPS - 30-day stability test expected to start in early October with a November implementation

NOS Gulf of Maine - 30-day stability test expected to start in early November with a December implementation

2. NOTES FROM EMC

2a. Global Modeling (Glenn White):

FV3 is running in forecast only and fully cycled parallels. The fully cycled parallel is still in development mode; after careful sensitivity experiments and tests and consultation with GFDL, parameters for background and divergence damping, horizontal mass advection, cloud water conversion, sponger-layer and Rayleigh friction have been adjusted in both parallels. FV3 exhibits more skill in precipitation forecasts, but has a low bias for high amounts. FV3 tropical storm forecasts appear quite competitive with the GFS.

The **GFS17** implementation in July included increased use of global hawk data and corrections to tropical storm relocation that reduced tropical storm track error in the Atlantic from those seen in the evaluation of the GFS17 this past winter. GFS forecasts of Harvey exhibited skill in forecasting the rapid deepening of central pressure; forecasts of Irma near Florida over deepened the storm. FV3 showed less over deepening of Irma in most forecasts.

2b. Mesoscale Modeling *(Eric Rogers)*

RTMA/URMA v2.6 Upgrade : Implementation approved by NCEP Director at June 26th briefing. Implementation scheduled for October 31, 2017

Highlights include min/max RH analysis, analysis of significant wave height, ceiling height improvements over Alaska, new WFO-adjusted terrain, GLERL adjusted obs over the Great Lakes, and relaxed QC criteria for temperature and moisture observations. We are also introducing RU-RTMA which updates every 15 minutes. For details, go to http://www.emc.ncep.noaa.gov/mmb/mmbpll/misc/upcoming.html (RTMA/URMA v2.6/PCPANL v3.0 entry) and RTMA/URMA/RURTMA v2.6 Overview

HIRESWv7/HREFV2: Science Briefing to NCEP Director was on June 15th, code has been handed off to NCO and implementation is scheduled for 1 November 2017

Changes : Increase horizontal resolution of existing members from 4.2 km to 3.2 km; add "NSSL" WRF-ARW member (to operationalize Storm-scale Ensemble of Opportunity (SSEO); enhance HREF ensemble products, add OCONUS product generation. For details go to the HIRESWv7/HREFv2 NCEP OD briefing

RAPv4/HRRRv3: This package, containing multiple enhancements to improve cloud and visibility forecasts and reduce excessive coverage of convection, will also have HRRR-Alaska added. In addition, the 00/06/12/18z HRRR cycles will be extended to 36 hours, while the 03/09/15/21z RAP cycles will be extended to 39 hours. The official evaluation period will begin in roughly 2 weeks.

2c. Marine Modeling

Ocean: RTOFS Global upgrade has a target date of 10/17. Presently, running in parallel.

3. EARTH SYSTEM RESEARCH LAB

Experimental real-time RAPv4/HRRRv3 development

- Currently producing experimental extended-length RAPv4/HRRRv3 forecasts
  - RAPv4/HRRRv3 operational plan:
    - ❏ RAP 39hr fcsts at 03z, 09z, 15z, 21z
    - ❏ HRRR 36hr fcsts at 00z, 06z, 12z, 18z
    - ❏ 21/18 hrs otherwise
- FFaIR special experimental runs: RAP 09/21z 51hr, HRRR 00/12z 48hr
  - https://rapidrefresh.noaa.gov/RAP
  - https://rapidrefresh.noaa.gov/hrrr/HRRR

  Future status of these 48 hr extended runs TBD

- Currently producing experimental OCONUS HRRRv3 runs
  - HRRR-Alaska, 36 hr forecasts, every 3 hrs (operational plan TBD)
  - HRRR-Hawaii, 24 hr forecasts, every 3 hrs (operational plan TBD)
- June 2017 code delivery to EMC, Feb 2018 implementation

Experimental real-time HRRR-TLE

- Uses multiple consecutive runs of experimental HRRRv3 with time/space filters
  - Currently producing 24 hr forecasts, updated hourly
  - Probabilistic products for QPF, winter weather, severe weather, aviation
  - Added probability of significant hail, wind and critical fire weather
  - https://rapidrefresh.noaa.gov/hrrr/hrrrtle
- NCO implementation as ensemble post-processor possible sometime 2018-19

Experimental real-time HRRRE

- Real-time runs resumed 01 March 2017 for VORTEX-SE and HWT
  - Nine forecast members produce 18 hr fcsts every three hours from 12-18z each day
  - 55% CONUS HRRR domain (central and eastern US)
- FFaIR special 00z CONUS HRRRE domain runs now ended
- AWC testbed 09z/21z nine-member ensemble 55% CONUS HRRR 36 hr fcsts
  - Added HRRR-TLE ensemble post-processing capability including aviation products
  - https://rapidrefresh.noaa.gov/hrrr/HRRRE

Experimental real-time 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 merge with experimental HRRR later this year
  - https://rapidrefresh.noaa.gov/hrrr/HRRRsmoke/

4. NATIONAL OCEAN SERVICE:

5. FEEDBACK FROM MDL/OPERATIONAL CENTERS/REGIONS

5a. MDL (*Scott Scallion*)

- NBM V3.1 is scheduled to become operational in July of 2018. We are continually filling in NWS Service Program gaps. The primary development period is August through October 2017. Here is a listing of many of the weather elements being addressed in NBM V3.1.
    - **Hydrology:** Leverage OAR Stochastic Quantile Mapping technique. Add QPF01 to OCONUS sectors. Add QPF01 to OCONUS sectors. Add 1 and 6 hour snow, sleet, and ice accumulations to weather grid inputs.
    - **Marine:** Add NAVGEME to Oceanic Winds. Add significant wave heights to all 5 sectors. Add 30-m and 80-m winds, 10-m gusts, and PMSL.
    - **Aviation Weather:** Add Echo Tops (18 dBZ) (1-36h)) and Low Level Wind Shear (LLWS). Add ceiling, visibility, lowest cloud base to OCONUS sectors.
    - **Fire Weather:** Add Mixing layer, Transport Wind (i.e., average wind speed in the mixing layer), and Haines Index.
    - **Tropical:** Add HWRF and HMON to improve background field for Tropical TCM forecasts.
    - **Thunderstorms:** Increase ProbThunder temporal resolution to 1 hour through 36 hours.
    - **Additional Models**: Add REPS, RDPS, ACCESS-G, NAVGEMD

- GFS-MOS and EKD-MOS - handed off to NCO, but on hold
    - Science briefing 5/30 - Approved for handoff.
    - To include expanded CONUS domain for NBM input (EKD-MOS only)
    - Includes updated Ceiling/Sky Cover Equations

- New GFS/NAM visibility/obstruction to vision equations to be handed off and briefed within next few weeks.
    - Neither development contains data from absolute latest versions of the models (i.e. no NAM v4 or GFS v14). Nonetheless, tests suggest significant improvement over existing systems.
    - Expected handoff to NCO at approximately the end of September.
    - Scheduled implementation on WCOSS January 2018
    - Implementation to be “bundled” with other lingering NAM items (PoP/QPF, cig/sky) that were completed some time ago.

- EKDMOS V2.2
  - Add other MOS forecasts to EKDMOS (GFSMOS, NAMMOS, ECMMOS, EMCEMOS, LAMP)
  - Expand the Alaska domain to match the NDFD domain
    - Continue to disseminate clipped grids
  - Add forecasts for apparent temperature, PQPF, and wind speed
  - Operationalize text products
  - Update CONUS unified terrain and land/water mask
  - Code freeze is set for January 30, 2018
  - Code handoff to NCO is set for March 14, 2018

- GMOS
  - Add new stations to CONUS analysis
  - Expand CONUS and Alaska domains to match the NBM domains
    - Continue to disseminate clipped grids
  - Update unified terrain and land/water mask for CONUS, Alaska, and Hawaii
  - GMOS update code freeze is set for January 30, 2018
  - GMOS update code handoff to NCO is set for March 14, 2018
  - 5km GMOS was removed from the operational jobstream on July 18; 2.5km GMOS replaces that product in all applications going forward.

- P-ETSS 1.0 / ETSS 2.2 - After several restarts, NCO requested MDL do a science briefing before another handoff. The science briefing has been scheduled for Thur Oct 12.

- P-Surge 2.7 - Under development

- LAMP/Gridded LAMP (updates in blue)
  - Implementations:
    - The next LAMP/GLMP implementation (v2.1.0) will include the following changes:
      - new LAMP 1-hr convection and lightning guidance,
      - modifying LAMP to use the most recent METAR observation including SPECIal observations,
      - adding stations to the LAMP forecasts to match the stations available in GFS MOS,
      - running LAMP/GLMP every 15 minutes for ceiling and visibility guidance out to 3 hours in time for AWC
    - The codes for the above changes were handed off in June and will be implemented in early November 2017.

  - Experimental Data:

- MDL continues to produce 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. Images of this guidance are available at: http://www.weather.gov/mdl/lamp_experimental
- MDL is producing updated LAMP/GLMP ceiling and visibility guidance every 15 minutes out to 3 hours using the most recent hourly observations, including "Special" observations. The experimental 15-minute LAMP and GLMP data and images are also available at the LAMP experimental website: http://www.weather.gov/mdl/lamp_experimental

5b. NCEP Centers

- Weather Prediction Center (WPC):

WPC's Winter Weather experiment has changed for this season from a residence format to a distance experiment. It will be conducted weekly beginning November 14 and continuing through March 9, 2018 and executed remotely from HMT-WPC. Participants will be asked to join remotely for forecast activities on Tuesdays and verification activities on Wednesdays. Please contact Mark Klein (mark.klein@noaa.gov) for more information if interested in participating.

- 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):

- Eastern Region (ER):

6. Office of Water Prediction

- 30-day Science evaluation for revised NWM V1.2 started today based on RFC feedback.
- Question: Is an archive of GEFSv10 forecasts available, including from non-00Z times?

7. NESDIS

Jason-2 in Safe Hold on September 14, 2017
After 2 months of smooth operation on the Long Repeat Orbit (LRO) the Jason-2 spacecraft entered safe hold mode (SHM) on September 14 at 07:13:04 UTC, immediately interrupting its measurements. The OPS team at NOAA and Centre national d'études spatiales (CNES) applied immediately necessary procedures and the satellite is currently in a safe and stable Sun-pointing configuration. First investigations show that Gyrometer 1 was blocked, triggering the reconfiguration to SHM. The gyros temperature increase during the period where the Beta angle is high remains a concern. All other equipment is nominal. The period concerning the high temperature of the gyro will continue until October 3, so SHM recovery (NOMINAL MODE) is not expected before this date and likely not before the next YAW Fix period, which starts October 12. The 4 partners operational teams are working closely to support current and future operations. The mission will resume as soon as technically possible. Jason-2 Sea Surface Height Anomalies are important inputs for the generation of Satellite Derived Ocean Heat Content used to predict tropical cyclone intensity.(David Donahue, 301-683-3236)

Activation of Suomi-NPP VIIRS Moderate Band 11 (M11) for Nighttime Data Collection
Suomi-NPP Engineers have scheduled the activation of VIIRS Moderate Band 11 (M11) to enable nighttime data collection on October 11, 2017 after 1800 UTC. This planned change will provide both science and operational benefits such as improved fire detection and monitoring. Authorized subscribers to VIIRS M11 from the ground segment systems or from direct broadcast services such as High Rate Data (HRD) should expect to see data volume increases for M11 on and after October 11, 2017 as data is collected during day and night times. (Chris Sisko, 301-817-4783)

NOAA-15 reaches 100,000 Revs on August 5, 2017
NOAA-15 will change in rev count but remain as a 5 digit number in both the 2li and 4li elements. NOAA-15 Rev Odometer rolled over to 00001 not 00000. The roll over to “1” follows the launch protocol to not count Rev “0”. (Carl Gliniak, 301-817-4207)

GOES-16 Coverage of Total Solar Eclipse on August 21, 2017
On August 21, the first total solar eclipse to moved across the United States in 99 years. GOES-16 captured the eclipse with both the Advanced Baseline Imagery and Solar Ultraviolet Imager. ABI had a clear view of the moon’s shadow as it traveled diagonally across the Continental United States from the Pacific Northwest through South Carolina and SUVI viewed the sun during the eclipse. The GOES-R program shared images and animations of the event from both ABI and SUVI. (Kathryn Mozer, 301-286- 3647)

The next Synergy Meeting is scheduled for October 30 at 2:30 pm EDT in NCWCP

conference room 2890, with remote teleconferencing capability.

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