

# NCEP Synergy Meeting Highlights: April 30, 2018

*This meeting was led by Mark Klein (WPC) and attended by Steven Earle (NCO); Eric Rogers, Ben Blake, Jacob Carley, and Geoff Manikin (EMC); Steve Weiss (SPC); Richard Pasch (NHC); Jeff Craven (MDL); Curtis Alexander (ESRL); Greg Patrick (SR), Brian Cosgrove (OWP), and Jason Taylor (NESDIS).*

## 1. NOTES FROM NCO (Steven Earle)

**PSURGE** - NCEP Directory briefing held on May 2; Implementation scheduled for May 7  
<http://www.nws.noaa.gov/os/notification/scn18-36psurge.htm>

### **NAEFS**

#### **CCPA**

**EKDMOS** - 30-day stability test expected to start in early May with a mid-June implementation

**WSP** - Canned testing ongoing with NHC; implementation expected by end of May

**Sea Ice** - 30-day stability test expected to start on May 7 with a mid-June implementation

**RAP/HRRR** - 30-day stability test expected to start the week of May 7 with a June implementation

**HYSPLIT** - 30-day stability test expected to start the week of May 14 with an implementation in late June

**GLOFS** - 30-day stability test expected to start the week of May 14 with an implementation in late June

### **HWRF**

**HMON** - Work just beginning; will run canned tested through May and June... Implementation expected in early July.

### **EKDMOS**

#### **GMOS**

**NBM** - Work just beginning; expected to start the 30-day stability test in mid-June with implementation at the end of July, or early August

## 2. NOTES FROM EMC

## **2a. Global Modeling**

### FV3-GFS:

EMC is now running a full-cycled parallel 4x per day with the FV3 core. Most of the physics are still the same as the GFS, but the GFDL microphysical scheme is being used. The current plan is to conduct the formal evaluation (real-time and retrospectives) between the middle of May and the end of July (or possibly into August), with an implementation in early 2019. This plan still needs formal approval by NCEP and NWS management - we are close to having that final approval, but it is not yet 100% official. Data is now available on paranomads.

## **2b. Mesoscale Modeling**

### RAPv4/HRRRv3:

The implementation is now targeted for June 19. This upgrade includes the extensions of the RAP (03/09/15/21z) to 39 hours and the HRRR (00/06/12/18z) to 36 hours as well as the addition of HRRR-Alaska (run every third hour). Data from the NCO parallels is now available on paranomads. Note that due to saturation on the SBN, the extended forecast hours (beyond 18 hours) of the HRRR at 00/06/12/18z will not be transmitted over the SBN.

### v2.7 RTMA/URMA/RTMA-RU:

The evaluation parallel is expected to begin on May 7th. An announcement will be made soon. Folks interested in early access to the output can let us know now.

**\*\*Note that the control run for this system will be the RAPv4/HRRRv3 driven RTMA/URMA system run by NCO.\*\***

A summary/overview of changes may be found in the following MEG presentation:

[https://docs.google.com/presentation/d/1SF1\\_ohJgdsZVjsFSGROEkEU6-zfMZxq1LpQQ8ww8RQY/edit?usp=sharing](https://docs.google.com/presentation/d/1SF1_ohJgdsZVjsFSGROEkEU6-zfMZxq1LpQQ8ww8RQY/edit?usp=sharing)

Developers have also put together pages to view and evaluate the system.

v2.7 parallel (all components):

[http://www.emc.ncep.noaa.gov/mmb/jcarley/rtma\\_urma/v2p7/URMA](http://www.emc.ncep.noaa.gov/mmb/jcarley/rtma_urma/v2p7/URMA)  
[A](#)

## V2.6 Control run (all components):

[http://www.emc.ncep.noaa.gov/mmb/jcarley/rtma\\_urma/ctl/URMA/](http://www.emc.ncep.noaa.gov/mmb/jcarley/rtma_urma/ctl/URMA/)

### HREF v2.1:

EMC has plans to implement an upgrade to HREF in the October-December 2018 time frame. Changes include adding the extended HRRR runs, adding (at the request of SPC) a few additional severe wx fields to the NAM nest for it to be consistent with Hiresw/HRRR model output (-10C level reflectivity, 100-1000 mb hourly max updraft speed, 0-3 km and 2-5 km AGL hourly minimum updraft helicity), refine the generation of probabilistic output, add bias corrections, and add FFG and RI exceedance products

## ***2c. Marine Modeling***

### RTOFS:

- New products (global surface GRIB2 data, new sea ice products)
- Updating HYCOM version to v99 (no big changes in the results are expected)
- FV3GFS interface for air-sea forcing.

### NWPS:

The next wave\_multi\_1 upgrade (version 4.0.0) will happen in tandem with the FV3 implementation. The upgrade is now set to include:

- Addition of higher resolution global-scale grids,
- RTOFS surface currents for interaction with waves,
- physics tune-up from objective optimization,
- redesign AWIPS products to match NEMS framework,
- removal of legacy grid products.

The Great Lakes waves unstructured grid system will be upgraded in August 2018, including the addition of high-resolution ice analysis to improve nearshore wave prediction during the winter season.

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

- NCO/EMC RAPv4/HRRRv3
  - NCO parallel running with data available on paranomads
  - 10 May start for 30-day stability test
  - 11 June NCO Management
  - 19 June Implementation
  - Additional diagnostics will be available
  - RAP 39hr fcsts at 03z, 09z, 15z, 21z, 21 hrs otherwise

- HRRR-CONUS 36hr fcsts at 00z, 06z, 12z, 18z, 18 hrs otherwise
- HRRR-Alaska, 36hr fcsts at 00z, 06z, 12z, 18z
- HRRR-Alaska, 18hr fcsts at 03z, 09z, 15z, 21z
- ESRL/GSD RAPv5/HRRRv4
  - <https://rapidrefresh.noaa.gov/RAP>
  - <https://rapidrefresh.noaa.gov/hrrr/HRRR>
  - Fractional lake ice-concentrations (GFS-based)
  - Assimilation of moisture observations above 300mb
  - Change to revised albedo/land use from MODIS
  - Remove mosaic snow building/trimming for 2mT < -2C
  - Update cloud water number concentration from RAP to HRRR initialization (default value that is too low)
- ESRL/GSD HRRRE, now re-configured for Spring Forecast Experiment
  - Nine forecast members + ensemble products
  - 12z, 18z, 21z, half-CONUS forecasts to 48, 18, 18 hrs
  - 00z full-CONUS forecasts to 36 hrs
  - Leverages HRRR-TLE post-processing for product generation
  - <https://rapidrefresh.noaa.gov/hrrr/HRRRE>
- ESRL/GSD HRRR-Smoke runs:
  - Run every six hours out to 36 hrs over CONUS and Alaska
  - Produces smoke plume estimates from VIIRS fire data
  - Merging with experimental HRRRv4 prototype in May
  - <https://rapidrefresh.noaa.gov/hrrr/HRRRsmoke>

#### 4. NATIONAL OCEAN SERVICE

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

##### 5a. MDL (Jeff Craven)

- NBM: MDL's NBM V3.1 Science Briefing took place in March and was approved by Dr. Bill Lapenta for implementation. In early April, MDL/SMB handed-off the NBM V3.1 code package to NCO - MDL plans for an early August 2018 Implementation date. The NBM team is busily developing weather elements for V3.2 whose requirements and procedures have been defined and agreed upon by upper management. We do note that since the NBM V3.2 requirements for

PWPF and PQPF are still ill-defined significant progress in those areas has not yet been realized. We anticipate clarification on those requirements in the coming month. As the NBM moves towards probabilistic guidance with each upgrade, additional probabilistic information will continue to be added (e.g., MaxT/MinT exceedances).

- GFS MOS: The package of updates to GFS MOS aviation elements (cig/sky cover and vis/obvis) was handed off to NCO this month. Code was bundled with updates to GMOS and NBM 3.1. We will continue to run the current set of GFS MOS equations for these elements in parallel until LAMP products using these as inputs can be redeveloped.
- GMOS: Updates to support the NBM were handed off to NCO. Code will be implemented in FY18Q4 alongside NBM V3.1.
- EKDMOS: Updates to support the NBM and to include other MOS products were handed off to NCO. Code will be implemented in FY18Q4 alongside NBM V3.1.
- LMP/GLMP: Work continues on LMP/GLMP v2.2 which is expected to be implemented in Q1 FY19. This work includes the following planned changes:
  - Updating ceiling and visibility guidance using the upgraded GFS MOS and HRRRv3 inputs
  - Extending ceiling and visibility guidance out to 36 hours to support the NBM and TAF creation
  - Expanding the GLMP domain to cover the NBM domain for ceiling and visibility
  - Adding 1-hr POP (POP01) guidance to the LMP/GLMP suite of products. This new guidance will cover the 36-hour period and be available both at stations and on the new GLMP domain which matches the NBM domain. It is expected that the POP01 guidance will replace the current LAMP Probability of Precipitation Occurring (POPO) which is guidance for precipitation, not necessarily measurable, occurring on the hour.
  - Updating the existing 6-hr POP (POP06) LAMP guidance and adding POP06 to the Gridded LAMP suite (tentative).
- P-Surge: NCO is actively working to implement P-Surge 2.7 before the upcoming hurricane season.
- P-ETSS: MDL is developing P-ETSS 1.1 / ETSS 2.3 which will update the East Coast basin, the Gulf of Mexico basin, and use the 42 member NAEFs for 00 and 12Z while using the 21 member GEFS for 06 and 18Z. The coordination meeting occurred in March, and the Science review is planned for July.

#### **5b. NCEP Centers**

- Weather Prediction Center (WPC)

- The HMT Flash Flood and Intense Rainfall experiment is scheduled for the following 4 weeks this summer:
    - Week 1: June 18-22, 2018
    - Week 2: June 25-29, 2018
    - Week 3: July 09-13, 2018
    - Week 4: July 16-20, 2018
- NWS personnel - if interested, please contact your SSD chief

- Storm Prediction Center (SPC)
  - HWT Spring Forecasting Experiment is ongoing and will continue through June 1, 2018.
  
- 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), Greg Patrick:** When the HRRRv3/RAPv4 is

implemented this spring at NCEP, will the additional data (e.g. 36 hour runs every 6 hours) automatically be viewable in the AWIPS2 CAVE at WFOs? Or is that capability to view longer HRRR/RAP runs tied to modifications in an A2 build?

- Answer: No, due to saturation on the SBN, this data will not be transmitted.

The project described in the paragraphs below is still in the planning stages, but I wanted to share with the group for their awareness. I believe Steve Koch and/or Erik Rasmussen (NSSL) may have already reached out to some folks at ESRL regarding tying in additional real-time tests or experiments with this unique dataset.

**VORTEX-Southeast** (Erik R - NSSL, project manager) plans to gather data during ten 48-hour IOPs over a 4-5 month period beginning around Dec 1, 2018. The meso-alpha network will consist of existing Upper Air sites operating on a 6-h sounding schedule, with supplemental profiler and mobile UA stations across the SE US.

The north Alabama meso-beta (nested array) deployment will consist of doppler radars, mobile sounding systems, thermodynamic/wind profilers, and 20+ surface mesonet stations.

- Central Region (CR):
- Eastern Region (ER):

## 6. Office of Water Prediction

- NWM V2.0 development is progressing on schedule. The public science evaluation 30-day test is scheduled for August, with implementation scheduled for Q2 2019. Upgrades include an ensemble medium range configuration, an improved Analysis cycle and a domain expansion to cover Hawaii.

## 7. NESDIS

### **NOAA-20 (JPSS-1) Key Performance Parameter (KPP) Data Release/Activation on PDA:**

NESDIS activated the NOAA-20 KPP data sets on the Product Distribution and Access (PDA) system on April 2, 2018 starting at 1500 UTC. KPP's are those NOAA-20 products that have reached provisional/operational status. Information on specific product listings can be found at:

<https://www.star.nesdis.noaa.gov/jpss/AlgorithmMaturity.php>

### **GOES-16 Rainfall Rate/QPE L2 Data Declared Provisional:**

The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for ABI L2+ Rainfall Rate / QPE (RRQPE) Provisional Maturity was held on March 30, 2018. As a result of this review, the PS-PVR panel recommended that the ABI Rainfall Rate / QPE product be declared Provisional. A full description and format of the RRQPE product can be found in the Product Definition and User's Guide (PUG) document (<http://www.goes-r.gov/products/docs/PUG-L2+-vol5.pdf>). The algorithm used to derive the RRQPE products from GOES-16 ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Rainfall Rate / QPE" ([http://goes-r.noaa.gov/products/ATBDs/baseline/Hydro\\_RRQPE\\_v2.0\\_no\\_color.pdf](http://goes-r.noaa.gov/products/ATBDs/baseline/Hydro_RRQPE_v2.0_no_color.pdf)). (Wayne Mackenzie, 301-286-1364)

**GOES-16 Sea Surface Temperature L2 Data:** The GOES-R Peer/Stakeholder Product Validation Review (PS-PVR) for the Advanced Baseline Imager (ABI) L2+ Sea Surface Temperature (SST) Provisional Maturity was held on March 9, 2018. As a result of this review, the PS-PVR panel recommended that the ABI SST product be declared Provisional. A full description and format of the SST product can be found in the Product Definition and User's Guide (PUG) document (<http://www.goes-r.gov/products/docs/PUG-L2+-vol5.pdf>). The algorithm used to derive the SST product from GOES-16 ABI observations is described in detail in the "GOES-R Advanced Baseline Imager (ABI) Algorithm Theoretical Basis Document for Sea Surface Temperature" (<https://www.goes-r.gov/products/ATBDs/baseline/baseline-SST-v2.0.pdf>). (Wayne Mackenzie, 301-286-1364)

### **GOES-16 ABI L2 Fire/Hot Spot Detection and Rainfall Rate Products:**

On March 30, the GOES-16 Advanced Baseline Imager Level 2 Fire/Hot Spot Detection product and Rainfall Rate product was declared to be at the provisional validation maturity level by the Peer Stakeholder Product Validation Review Board. (Wayne Mackenzie, 301-286-1364)

### **Declaring the NOAA Unique Combined Atmospheric Processing System (NUCAPS) Phase 4 Part 2 Product System Operational:**

On April 18, 2018 the decision briefing for declaring the NUCAPS Phase 4 Part 2 to process the Cross-track Infrared Sounder (CrIS) Full Spectral Resolution (FSR) data from the Suomi-National Polar-Orbiting Operational Environmental Satellite System Preparatory Project (SNPP) operational was presented to the Satellite Products and Service Review Board (SPSRB) and was approved for operation. This implementation includes the CrIS FSR data for deriving the Environmental Data Records (EDR) from SNPP satellite to overcome the shortfall of trace gases retrievals and an improved performance of thermodynamic variables such as Temperature, Water Vapor and Ozone profiles. The NUCAPS Carbon Monoxide (CO), Carbon Dioxide (CO<sub>2</sub>), and Methane (CH<sub>4</sub>) data products are comparable with the equivalent heritage products



from IASI. The NUCAPS products are used by the Advanced Weather Interactive Processing System (AWIPS) of National Weather Service (NWS) and will be available within 125 minutes of observation to its users. (Dr. Awdhesh Sharma (A.K.), 301-683-3229)

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**The next Synergy Meeting is scheduled for *Tuesday, May 29* at 2:30 pm EDT in NCWCP conference room 2890, with remote teleconferencing capability.**

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

Passcode: **524234#**