NCEP Synergy Meeting Highlights: February 23, 2015

This meeting was led by Mark Klein (WPC) and attended by Scott Jacobs and Tony Fracasso (WPC); Simon Hsiao and Kelly Kempisty (NCO); Mark Iredell and Geoff DiMego (EMC); Dave Zelinsky and Hugh Cobb (NHC); Israel Jirak and Steve Weiss (SPC); Bob Grumbine (MMAB); Phil Shaffer and Dave Myrick (MDL); Jeff Waldstreicher (ER); Jeff Craven (CR); Andy Edman (WR); Bill Bua (UCAR/COMET)

1. NOTES FROM NCO (*Simon Hsiao*)

Parallel runs of the RTMA/URMA started the week of February 16. A question was posed about the start of the official 30-day evaluation period. Becky will provide an announcement, but it is expected to begin March 2, with files available on ftpprd for download. The files have been available ahead of the typical evaluation period as it's being run on the Phase 2 systems and tested for stability. Implementation is expected the 2nd week of April.

Code for the Extratropical Storm Surge (ETSS) upgrade has been delivered. Work to incorporate the code is in progress, but no implementation date has been set.

Waiting for the code comprising the next GEFS upgrade. It's expected in the next week or so from EMC. Parallel files should be available about a month after code delivery. Target for implementation remains April-May.

2. NOTES FROM EMC

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

- GEFS upgrade (v11.0.0)
    - This is a major code delivery and there's still a fair amount of work to do, but expecting a Q3 implementation.
    - Horizontal resolution - increase from 55km to 34km from F000-F192, and from 73km to 55km from F192-F384
    - Vertical resolution increase from 42 to 64 levels
    - Data created at 3-hour time steps through F192
    - Initial perturbations based of EnKF to promote increased spread.
    - Legacy GEFS to run at 00Z only to support reforecasts
    - Question remains if the GRIB2 file names will change for forecast hours less than 100 hours. Current naming convention is 2 digits. Possibly will change to 3. If changed, there will be downstream effects to the SREF and NDAS.
- CFS upgrade (v2.2)
    - Targeted for implementation after GEFS - (Q3)
    - Will use modern GSI data assimilation scheme

- NGAC (NEMS Global Aerosol Component) upgrade in Q1
    - Aerosol component (chemistry from NASA)
- Looking ahead...the next GFS upgrade will be during winter (2015-16)
    - Include 4D data assimilation
    - NEMS infrastructure
    - A few physics changes planned

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

- SREF upgrade (v7.0.0)
    - Targeted for implementation - FY15 Q3
    - CFL violation detected in recent testing, which has slightly delayed code delivery to NCO
    - Focus is on 2 cores, NEMS-NMMB and WRF-ARW. WRF-NMM removed.
    - Horizontal resolution will remain at 16-km, but membership increases to twenty-six (13 NMMB, 13 ARW)
    - Increase from 35 to 40 levels
    - Initial conditions diversity is enhanced: (a) mix use of multiple analyses (NDAS, GFS and RAP) for each model core, and (b) blending of GEFS and SREF IC perturbations for all members
    - Physics diversity is enhanced: (a) more variety of physics schemes, and (b) stochastic flavor in physics parameters (GWD and soil moisture)
    - Goal is to avoid clustering of solutions around individual cores
    - Add variables at 80m AGL
    - Add TKE, wind chill, heat index, wind gust fields
    - Will be running retrospective runs for SPC for testing

- HiresWindow upgrade (v6.1.0)
    - Targeted for implementation - FY15 Q3
    - Along with the HRRR and NAM Nest, will form the core of the upcoming mesoscale ensemble suite
    - Increase vertical resolution from 40 to 50 levels
    - Hourly data assimilation
    - Horizontal resolution will remain ~3-4 km depending on the domain
    - Improved simulated reflectivity, but need to tune it to avoid degrading the QPF
    - Addition of lightning and ceiling height

- Next NAM upgrade is scheduled for early FY16
    - Likely implemented when the new Cray comes online rather than on Phase 2 of WCOSS as next GFS upgrade is slated for early FY16 as well
    - Nests for both CONUS and AK will increase to 3km resolution (from 6km and 4km, respectively)

- Physics upgrades to reduce warm season high QPF bias in CONUS nest
- LSM upgrades to reduce winter afternoon cool bias over the CONUS
- Upgrades to GSI analysis and data assimilation
  - Replace NDAS 3 hr update frequency with RAP-like hourly cycle of NAM Rapid Refresh (NAMRR)
  - Continue NDAS-like reach-back to GDAS with catch-up cycle every 6-h or 12-h
  - 4-d version of hybrid ensemble variational analysis
  - Diabatic digital filter radar-derived temp. tend. & cloud analysis
  - Tropical cyclone relocation [Sandy Supplemental]
- Hourly updated analysis, which will incorporate reflectivity to improve precip
- Upgrade observation processing
  - Accommodate TAC –to–BUFR conversion of international transmissions including high density radiosondes with thousands of levels in vertical
  - Use Doppler obs from MRMS ingest on IDP with 3 new Caribbean sites [SS]
  - Improve radial wind qc and start moving MRMS into GSI [NextGen]
- New observations in analysis and data assimilation
  - SEVIRI, NOAA17-18 SSMIS, Metop_B (IASI, HIRS4, AMSUA, MHS), Himawari, NPP (ATMS, CRIS), …
  - New sources of aircraft observations [Sandy Supplemental]
  - Tower & nacelle obs from wind power producers

2c. Marine Modeling and Analysis Branch (MMAB) *(Bob Grumbine).*

- Nearshore Wave Prediction System coming online
- RTOFS Global ocean model (v1.1.0) and RTOFS Atlantic
  - Targeted for implementation - FY15
  - Still have some issues to work out with the Navy
  - Atlantic upgrade dependent on Global
  - Will include updates to surface water temperatures and sea ice

3. NATIONAL OCEAN SERVICE (*No representative. Information from December 2014 NCEP Production Suite Review presentation*):

NOS Operational Forecast System transitioning to NCEP

- Lake Erie upgrade FY15 Q4 - Resolution will be increased to 2.5km and forecasts will be available out to 120 hours.
- Future planned upgrades
  - FY 16 - Cook Inlet (AK), Lake Michigan
  - FY17 - Gulf of Maine OFS, Huron-Erie Corridor

- FY18 - West Coast OFS, Lake Superior OFS
- FY19 - Lake Ontario OFS

4. FEEDBACK FROM MDL/OPERATIONAL CENTERS/REGIONS

4a. MDL (*Phil Shaffer and Dave Myrick*)

- Q2 FY15
  - Refresh of GFS MOS for warm season equations - expected implementation on March 24. TIN has gone out already.
  - Extratropical Storm Surge (ETSS) upgrade. (Implementation expected April 10)
    - Nest course extratropical basins with fine-scale tropical basins for East Coast and Gulf of Mexico
    - Implement inundation code for storm surge
    - Operationalize post processing methods for computing total water level at stations
  - Probabilistic Storm Surge (PSURGE) upgrade (Implementation delayed)
    - Increase temporal resolution from 6-hourly to 1-hourly time steps for “incremental exceedance above datum” products.
    - Output will be on 2.5km grid
  - Extend GFS-based gridded MOS for CONUS and Alaska to Day 10
- Q3 FY15
  - Gridded LAMP upgrade v1.1.0 - improves temperature/dew point/ceiling height and visibility. Visibility includes HRRR input. Add winds and sky cover
  - ECMWF-based MOS implementation for 00Z and 12Z - May
  - NAM MOS upgrade expected in June
- National Blender Update
  - Phase 1 elements are expected Q1 FY16
  - Phase 2 elements to be added Q4 FY16

4b. NCEP Centers and NWS Regions

- Weather Prediction Center (WPC) (*Scott Jacobs, Tony Fracasso*): Nothing to report.
- Storm Prediction Center (SPC) (*Israel Jirak and Steve Weiss*): Nothing to report.
- National Hurricane Center (NHC) (*Dave Zelinsky and Hugh Cobb*): Nothing to report.
- Space Weather Prediction Center (SWPC) (No representative)
- Ocean Prediction Center (OPC) (No representative)
- Aviation Weather Center: (No representative)
- Pacific Region (PR): (No representative)
- Alaska Region (AR): (No representative)
- Western Region (WR) (*Andy Edman*): Nothing to report.

- Southern Region (SR): (No representative)
- Eastern Region (ER) *(Jeff Waldstreicher):* Nothing to report
- Central Region (CR) (*Jeff Craven*): During the meso discussion, asked about potential for EMC to create and distribute simple blends of guidance; a short-term (~36 hours) blend of guidance created centrally (e.g. HRRR/NAM Nest/SREF mean, etc…). No plans exist as yet, but it's perhaps a question to be explored with the SSD chiefs.
- OHD (No representative)

5. NESDIS (no representative)

The next Synergy Meeting is scheduled for March 30, 2015 at 2:30 pm EDT in NCWCP conference room 2890, with remote teleconferencing capability.

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