WCOSS Update

Fall 2016
NWS Partners Meeting

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November 1, 2016

Recent Model Changes

- **Global Forecast System (GFS)** -- May 11, 2016
  - Introduction of 4D Hybrid EnVar data assimilation
  - hourly output to day 5 available on NWS ftp servers

- **Hurricane Storm Surge Operational Forecast System (HSOFS)** – June 21, 2016
  - Ensemble storm surge guidance for coastal inundation caused by tide and surge for tropical cyclones impacting the East and Gulf Coast.
  - Currently being evaluated by National Hurricane Center

- **HWRF** – July 17, 2016
  - Increased nested domain size; use of Global RTOFS for initialization in East PAC.

- **GFDL** – July 17, 2016
  - Mostly bug fixes. Possibly last upgrade of GFDL.

Recent Model Changes

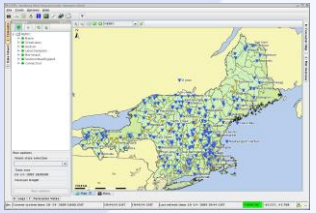
- **National Water Model (NWM)** – August 16, 2016

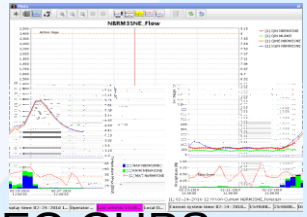
- **Rapid Refresh (RAP) version 3 and High Resolution Rapid Refresh (HRRR) version 2** – August 23, 2016
  - Extend RAP to 21 hours/HRRR to 18 hours – already added to NOAAPORT
  - Increase in RAP computational domain to include Hawaii
  - Update WRF-ARW core to v3.6.1
  - Did see data volume increase due to GRIB packing change
  - Plan to add HRRR sub-hourly grids to NOAAPORT once testing with AWIPS is complete

- **Real-Time Mesoscale Analysis (RTMA) and URMA version 2.4.4** – August 23, 2016
  - Change to use EMC/GFE consensus terrain, add cloud cover, add URMA for Puerto Rico and Hawaii
- **Geospace** – September 7, 2016
  - Provide regional specification and forecasts of geomagnetic storm conditions that impact the Nation's critical infrastructures to Space Weather Prediction Center

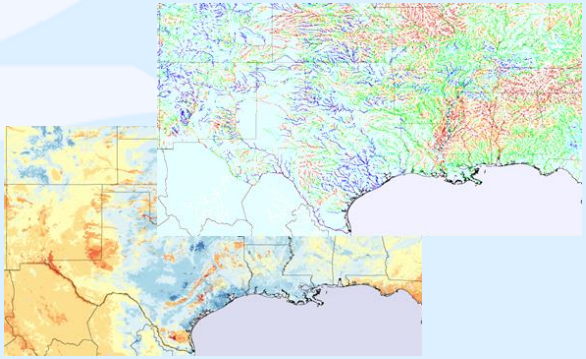
National Water Model (NWM)

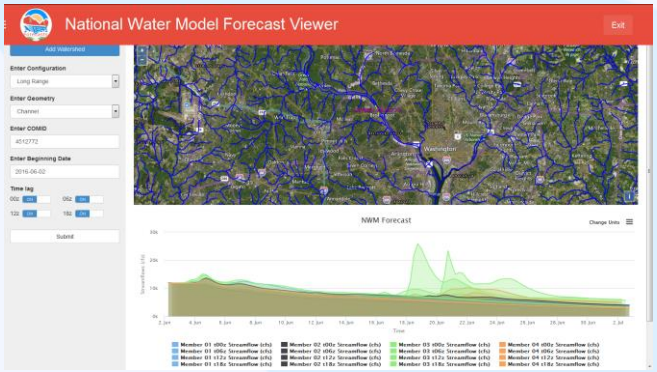
- Visualization and data dissemination key to success, area of active development
- Multi-pronged output dissemination strategy
  - OWP IDP-hosted website-based viewers (water.noaa.gov/map
    water.noaa.gov/tools/nwm-image-viewer)
  - Subsetted IDP-hosted data ftp to River Forecast Centers
  - NOAA NOMADS server (full set of NetCDF output)
  - Community tools and viewers via CUAHSI



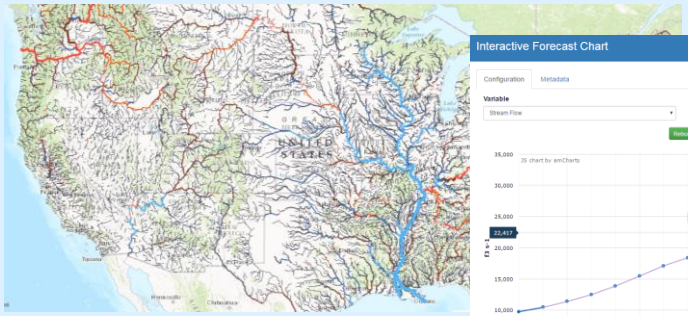


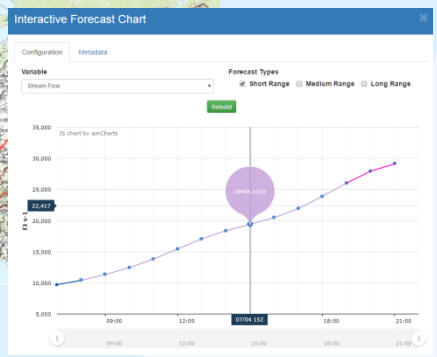
NWS RFC CHPS





Community Web Tools



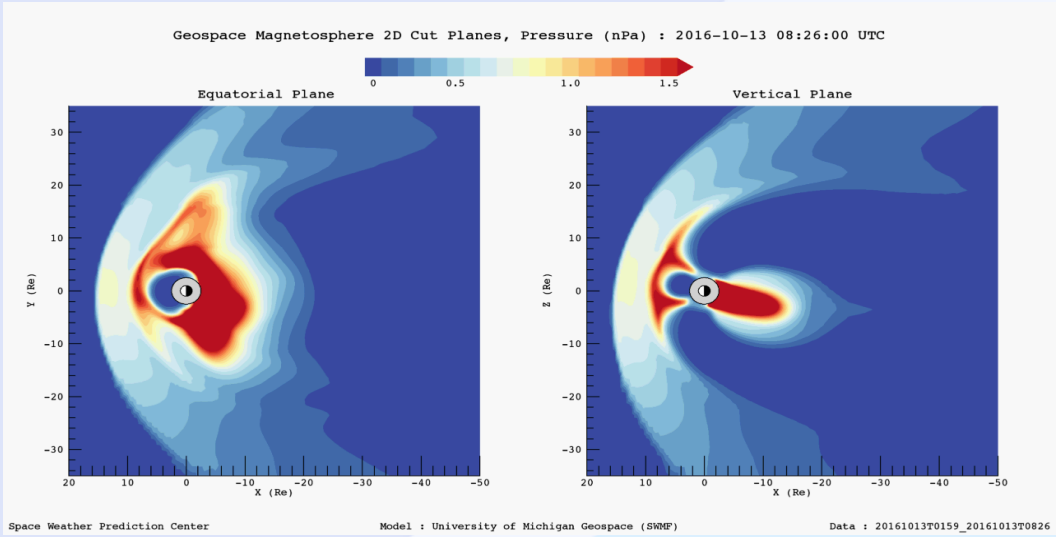


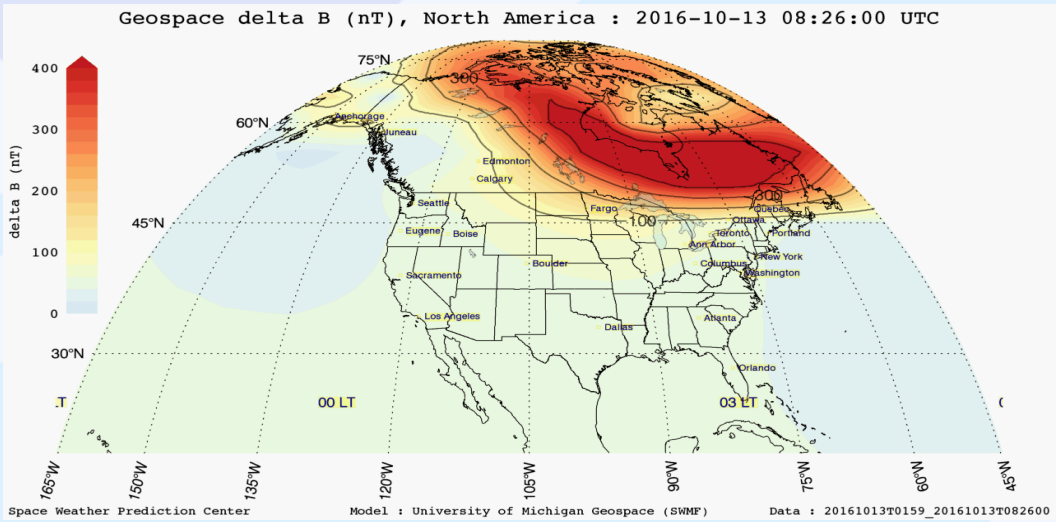
NWS Web Tools

Geospace Model
Space Weather Prediction Center

- Comprehensive time-dependent 3D model of the solar wind and Earth's magnetosphere.
- Model driven in real-time by L1 data from NOAA's DSCOVR satellite.
- Solar storm conditions yield ground-level magnetic field fluctuations which have the potential to damage electrical power grids.
- The Geospace model provides up to a 1 hour lead time forecast of regional magnetic fields to electric power operators.
- Operational at NCEP since September 7th 2016

Solar Wind – Magnetosphere Interaction





Regional Magnetic Fluctuation Forecast

Upcoming Model Changes

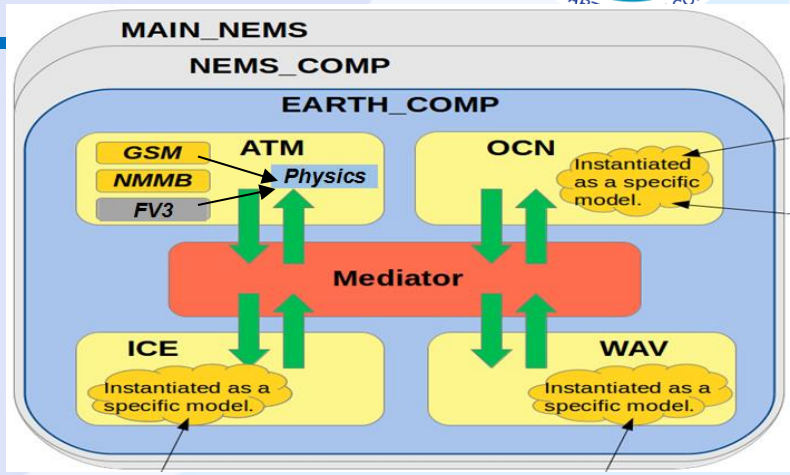
- **National Blend of Models (NBM) version 2** – November 15, 2016
  - Includes probability of precipitation and QPF, also additional domains
- **North American Model (NAM)** – January 2017
  - Increase resolution of CONUS and AK nests, data assimilation changes
- **RTMA/URMA v2.5 –** March 2017
  - Will include sub-hourly (15 minute) analyses for cloud and visibility
- **HWRF upgrade** – June 2017
- **NBM version 3 – Summer 2017**
  - Move to hourly NBM, produce Blend of short-term models (HRRR, SREF, LAMP, etc)
- **Global Forecast System (GFS) – May 2017**

Q3FY17 GFS V14.0 Implementation Plan

Transitioning GSM to NEMS

Objectives:

1. Transition Global Spectral Model into NEMS/ ESMF/NUOPC Framework
   - *Support integrating NGGPS FV3 dynamic core coupled to GFS Physics*
   - *Support developing unified coupled modeling system*
2. Physics and LSM improvements
   - *Convection scheme enhancements*
   - *TKE-based moist EDMF PBL scheme*
   - *High resolution(1km) vegetation and soil type data; MODIS snow and snow free albedo; GLDAS forced by observed precipitation; new USGS GMTED2010 terrain data*
   - *address the rapid temperature drop during sunset and wet bias during sunrise*
3. Data Assimilation improvements
   - *Near Surface Sea Temperature (NSST)*
   - *Inclusion of SEVIRI IR; VIIRS; GOES clear air water vapor winds; additional GPSRO data; RARS and DBNET data*
   - *Readiness for CrIS; JPSS and GOES-R*



Testing and implementation Plan:

- May 2015 through May 2017
  - *Two summers and two winters*
- Considered minor upgrade
  - *No resolution change, minor physics and DA changes*
- Significant downstream impacts
  - *Change from spectral sigio to nemsio requires making appropriate changes for many downstream models*
  - *Potential 1/8 degree output for selected fields*