NOUS41 KWBC 031050 AAB
PNSWSH

Service Change Notice 17-80 Updated
National Weather Service Headquarters Silver Spring MD
650 AM EDT Thu Aug 3 2017

To: Subscribers:
-NOAA Weather Wire Service
-Emergency Managers Weather Information Network
-NOAAPort
Other NWS Partners, Users and Employees

From: Dave Myrick
NWS Office of Science and Technology Integration

Subject: Updated: Hurricane Weather and Research Forecast (HWRF) Model Changes: Effective August 2, 2017 and Request for Comments

Updated to include a caution on using the HWRF wave parameters that are at a significant distance from a hurricane during its spin up period.

Effective on or about Wednesday, August 2, 2017, beginning with the 1200 Coordinated Universal Time (UTC) run, the National Centers for Environmental Prediction (NCEP) will upgrade the HWRF modeling system.

The scientific and technical enhancements include the following:

- Upgraded dynamic core from WRF3.7.1a to WRF3.8.1 (with bug fixes).
- Increased model vertical resolution from L61 (model top 2mb) to L75 (model top 10mb) for North Atlantic (NATL), Eastern Pacific (EPAC), and Central Pacific (CPAC) basins, and from L43 (model top 50mb) to L61 (model top 10mb) for Western Pacific (WPAC) and North Indian Ocean (NIO) basins. The vertical resolution has been redistributed to better resolve upper hurricane outflow levels.
- Slightly reduced size of the two nested domains: Domain 2 (d02) from 25 x 25 degrees to ~24 x 24 degrees; Domain 3 (d03) from 8.3 x 8.3 degrees to ~7.0 x 7.0 degrees.
- Improved vortex initialization with use of a new composite storm vortex.
- Included fully cycled HWRF ensemble hybrid Data Assimilation System for Tail Doppler Radar (TDR) and priority storms.
- Upgraded grid-point Statistical Interpolation (GSI) including new data sets for GSI (hourly Atmospheric Motion Vectors /AMV/, clear-water-vapor AMVs).
- Implemented new version of Geophysical Fluid Dynamics Laboratory (GFDL) vortex tracker.
- Made physics upgrades including scale-aware Simplified Arakawa-Schubert (SAS) scheme changes; Ferrier-Aligo microphysics scheme changes; adjusted momentum and enthalpy exchange coefficients (Cd/Ch); and partial cloudiness modifications for Rapid Radiative Transfer Model for General Circulation Models (RRTMG).
- Reduced coupling time step from nine minutes to 6 minutes for both ocean and wave coupling and adjustment of vortex tracking time step accordingly to provide more frequent tracking of the model vortex.

- Increased vertical level for Princeton Ocean Model (POM) from 24 to 41 levels.
- Applied Waves boundary conditions from the global wave model (Multi_1).
- Introduced Hybrid Coordinates Ocean Model (HYCOM) coupling for WPAC and NIO basins. One-way coupling to Wave model (Wave Watch III) for North Atlantic, East Pacific and Central Pacific storms allows decommissioning of the operational Hurricane Wave model (Multi_2). See Service Change Notice:

http://www.nws.noaa.gov/os/notification/scn17-71removal_wave_multi2.htm

The 2017 HWRF system has been fully tested and compared with the forecast results with 2016 operational HWRF. It has shown significant skill improvement in intensity forecasts (10 percent) and neutral to positive impact on track forecasts in all global basins:

http://www.nco.ncep.noaa.gov/pmb/changes/docs/FY17_H217_HMON_OD_brief_042817.ppt

Output Changes were made to the following NCEP Web Services:

http://nomads.ncep.noaa.gov/pub/data/nccf/com/hur/prod/
http://www.ftp.ncep.noaa.gov/data/nccf/com/hur/prod/
ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/hur/prod/

For hwrf.YYYMMDD, where YYYYMMDD is year, month, and day.

- New Wave products will be included for the North Atlantic, Eastern Pacific, and Central Pacific basins:

1. Text bulletins with partitioned wave spectral fields at buoys within the given domain are provided in tar files:

SN.YYYYMMDDCC.ww3_bull.tar
SN.YYYYMMDDCC.ww3_cbull.tar
SN.YYYYMMDDCC.ww3_csbull.tar

Where SN is the storm name, YYYYMMDD is the year, month and day, and CC is the model cycle runtime (i.e. 00, 06, 12, 18)

2. Full wave spectral outputs at buoys within the given domain are provided in tar file:

SN.YYYYMMDDCC.ww3_spec.tar

3. Gridded gridded binary version two (GRIB2) format wave parameters for the given domain in 1/10 degree resolution are provided in file:

SN.YYYYMMDDCC.ww3.grb2

Output Discontinuation on the following NWS Web Services:

http://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.hwrf_CY.CC/
ftp://tgftp.nws.noaa.gov/SL.us008001/ST.opnl/MT.hwrf_CY.CC/

Where CC is cycle.

- All HWRF output on the NWS Web Services will be discontinued. Users can find the exact same product on the NCEP Web Services sites with the URL listed above. Please reference this site for filenames:

http://www.nco.ncep.noaa.gov/pmb/products/hur/#HWRF

The HWRF GRIB2 products are not available on NOAAPort.

Sample data will be available on the PARA NOMADS Website after June 23, 2017:

http://para.nomads.ncep.noaa.gov

Sample Wave products from 2017 HWRF are available at:

http://www.emc.ncep.noaa.gov/gc_wmb/vxt/HWRF/index.php

More details about the HWRF system are available at:

www.emc.ncep.noaa.gov/index.php?branch=HWRF

NCEP encourages users to ensure their decoders are flexible and are able to adequately handle changes in content order, changes in the scaling factor component within the product definition section (PDS) of the GRIB files, and any volume changes which may be forthcoming. These elements may change with future NCEP model implementations. NCEP will make every attempt to alert users to these changes prior to any implementations.

Any questions, comments or requests regarding this implementation should be directed to the contacts below. We will review any feedback and decide whether to proceed.

For questions regarding these model changes, please contact:

Dr. Avichal Mehra
Lead Physical Scientist
NOAA/NCEP/Environmental Modeling Center
National Centers for Weather and Climate Prediction
College Park, MD
Phone: 301-683-3746
E-Mail: avichal.mehra@noaa.gov

For questions regarding the data flow aspects of these data sets, please contact:

Carissa Klemmer
NCEP/NCO Dataflow Team Lead
College Park, MD
Phone: 301-683-0567
E-Mail: ncep.list.pmb-dataflow@noaa.gov

National Service Change Notices are online at:

https://www.weather.gov/notification/archive

NNNN