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PNSWSH

Technical Implementation Notice 12-10
National Weather Service Headquarters Washington DC
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From: Timothy McClung
Science Plans Branch Chief
Office of Science and Technology

Subject: Hurricane Weather and Research Forecast
(HWRf) Model Changes: Effective May 15, 2012

Effective on or about Tuesday, May 15, 2012, beginning with the 1200 Coordinated Universal Time (UTC) run, the National Centers for Environmental Prediction (NCEP) will upgrade the HWRf - Princeton Ocean Model (POM) coupled system. The scientific enhancements include the following:

- Implement triple-nesting capability with a new centroid based nest movement algorithm
- Configure the inner-most grid at cloud-resolving 3 km horizontal resolution with explicit representation of convective processes
- Implementation of GFS Shallow Convection
- Modifications to SAS deep convection, GFS PBL, GFDL surface physics and Ferrier microphysics parameterizations suitable for higher resolution and based on observational findings
- Re-design of vortex initialization for 3 km resolution with improved interpolation algorithms and better representation of composite storm
- Improved POM initialization in the Atlantic domain and new 1-D ocean coupling for Eastern Pacific basin
- Upgrade the HWRf GSI to V3.5 and use of new Hybrid GSI/GFS for initial and boundary conditions once the Hybrid GSI/GFS has been implemented operationally
- Improvements to HWRf Unified Post Processor to generate new SSM/I simulated microwave satellite imagery products
- Very high-resolution (every 5 sec.) storm tracker output to support National Hurricane Center (NHC) operations

Test results from the combination of these upgrades showed significantly improved track, intensity and structure forecast

skills and improved track, intensity and storm radius forecast biases in both Atlantic and Eastern North Pacific basins.

Product Changes:

The following elements will be added to the HWRP model output GRIB files:

- simulated microwave satellite imagery products from SSM/I-S sensors

Additional products and their contents:

- new intermediate grid output GRIB files (*hwrpfs_i.grb* and *hwrfsat_i.grb*) at a horizontal resolution of 0.1 deg. lat/lon
- nest (innermost domain) GRIB files (*hwrpfs_n.grb* and *hwrfsat_n.grb*) will now be at highest resolution of 0.03 deg. lat/lon
- new merged grid (innermost + intermediate) output GRIB files (*hwrpfs_m.grb* and *hwrfsat_m.grb*) for selected variables at a horizontal resolution of 0.03 deg. lat/lon
- combined grid output GRIB files (*hwrpfs_c.grb* and *hwrfsat_c.grb*) will now be a combination of all three domains at highest resolution of 0.03 deg. lat/lon
- parent grid output GRIB files (*hwrpfs_p.grb* and *hwrfsat_p.grb*) remain unchanged and will be at the same 0.25 deg. lat/lon resolution.

A new very high temporal frequency (5 sec) tracker output product (ascii text file) is added at the request of NHC.

There will be an increase of roughly 8GB in product size due to high resolution output and additional elements.

These changes will result in about a 20 minute delay in product dissemination time. This change was proposed in an NWS Public Information Statement issued February 1, 2012. Based on the responses received, NWS will move forward with this change in dissemination time of the HWRP products.

The HWRP GRIB products are disseminated via the NCEP FTP server and are not available on NOAAPORT or AWIPS.

More details about the HWRP-POM are available at:

<http://www.emc.ncep.noaa.gov/HWRP/index.html>

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.

For questions regarding these model changes...please contact:

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NWS National Technical Implementation Notices are online at:

<http://www.nws.noaa.gov/os/notif.htm>

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