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Technical Implementation Notice 14-40 Amended
National Weather Service Headquarters Washington DC
945 AM EST Mon Nov 17 2014

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        -Emergency Managers Weather Information Network
        -NOAAPORT
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From:   Timothy McClung
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        Office of Science and Technology

Subject: Amended: Changes to the Hurricane (multi_2) and the
        Global (multi_1) wave models Effective January 7, 2015

Amended to change effective date to Wednesday, January 7, 2015

Effective Wednesday, January 7, 2015, beginning with the 1200
Coordinated Universal Time (UTC) run, the National Centers for
Environmental Prediction (NCEP) will upgrade the Hurricane and
Global wave models to WAVEWATCH III v4.15.1 and update the
underlying grids.

The Hurricane wave model (multi_2) uses a blend of GFS winds and
hurricane winds at 10 m above Mean Sea Level (MSL) as forcing
conditions, while the Global wave model (multi_1) uses just the
GFS forcings and is run side by side with the GFS forcing. Both
models use the same set of grids with the exceptions that the
multi_2 system has two additional regional grids (for blended
hurricane winds) and the multi_1 system has an Arctic grid (not
needed for propagating hurricane driven winds). Also the multi_1
system provides wave guidance out to 180 hours while the multi_2
system only goes out to 126 hours, the extent of the hurricane
guidance. It is useful to think of multi_1 as an early guidance
and multi_2 as a late guidance that includes the effects of
hurricane wind forcings.

The implications of the changes are highlighted below.

HURRICANE WAVE MODEL (multi_2) :
1. The Hurricane Wave model has been upgraded to the new
physics package that the Global Wave model uses. With this
change, both the Global and Hurricane wave models now use
the same physics. The advantages of the new physics packages
are:
  a. Better swell dissipation characteristics (this has
     implications for storms in the Pacific that have a

strong swell component)
  b. Better wave growth and decay properties as the storm
     passes
  c. A much better representation of the wave spectra,
     leading to a more accurate estimate of peak frequency
     and consequently storm arrival times
2. Update of the bathymetry of the various grids to be ETOPO1
based. ETOPO1 is a 1 arc-min global relief model of the
Earth that is provided by the National Geophysical Data
Center (http://www.ngdc.noaa.gov/mgg/global/global.html).
The bathymetry used to be based on the ETOPO2 bathymetric
set which was an earlier 2 arc-min global relief model.
3. Hurricane winds are now forced by the HWRF model as opposed
to the GFDL model.
4. Wave products are being delayed by an hour. Due to the
timing of the products the hurricane wave model was being
run using the previous cycle hurricane winds. Thus a 12Z
wave model would use 06Z hurricane winds. By delaying the
wave product delivery by an hour the 12Z cycle wave model
would use the 12Z cycle hurricane winds. Thus, the wave
products are actually being delivered earlier.

GLOBAL WAVE MODEL (multi_1):
1. The grids of the wave model are updated to be ETOPO1 based
(as opposed to ETOPO2 based)
2. The masks for the regional grids (wc_10m, at_10m and ep_10m)
are updated as per requests of Ocean Prediction Center and
Guam Weather Forecasting Office
3. There has been a change to a sub-section of output points
that were requested by the Ocean Prediction Center. They
have now requested a smaller set of output points. The list
of current and new points is listed here:

http://www.nco.ncep.noaa.gov/pmb/changes/wave_multi_bndry.sh
tml

The output data from these models are disseminated on the NCEP
server at

http://www.ftp.ncep.noaa.gov/data/nccf/com/wave/prod/
and
ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/wave/prod/

Sample output files from the new physics are available at

ftp://polar.ncep.noaa.gov/pub/waves/develop/

Details about the NCEP Multi-grid Wave Model are online at:

http://polar.ncep.noaa.gov/waves/index2.shtml

A consistent parallel feed of data will be available on the NCEP
server by mid October via the following URLs:

http://www.ftp.ncep.noaa.gov/data/nccf/com/wave/para

ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/wave/para

NCEP urges all users to ensure their decoders can handle changes
in content order, changes in the scaling factor component within
the product definition section (PDS) of the GRIB files, changes
to the GRIB Bit Map Section (BMS), and volume changes. These
elements may change with future NCEP model implementations. NCEP
will make every attempt to alert users to these changes before
implementation.

For questions regarding these model changes, please contact:

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For questions regarding the dataflow aspects of these data sets,
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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