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PNSWSH

Technical Implementation Notice 14-52  
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To:     Subscribers:  
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From:   Timothy McClung  
       Chief, Science Plans Branch  
       Office of Science and Technology

Subject: Changes to the Great Lakes Wave (GLW) System  
          Effective January 27, 2015

Effective Tuesday, January 27, 2015, beginning with the 1200 Coordinated Universal Time (UTC) run, the National Centers for Environmental Prediction (NCEP) will upgrade the Great Lakes Wave forecasting system (GLW), affecting both early and late runs:

Early run: GLW: at 00Z, 06Z, 12Z and 18Z  
Late runs: GLWN: at 03Z, 09Z, 15Z and 21Z

Changes include:

- Increased spatial grid resolution to 2.5km using a curvilinear Lambert conformal grid
- Increased spectral resolution to expand range to 1Hz
- Increased resolution of input wind fields from NAM smartinit
- Improved ice concentration analysis
- Switch to latest wave model version, WAVEWATCH III v4.15.1

The implications of the changes are as follows:

1. Increased spatial grid resolution to 2.5km is expected to bring improvements in the quality of forecasting with higher resolution grid better resolving coastal features and better representing wind fetch geometry near shore and during rapidly changing conditions. To that end, NCEP is using a new bathymetric database made available by the NOAA Great Lakes Research Laboratory (GLERL) at a 30 arcsec resolution, in association with high-resolution coastlines from NOAA Office for Coastal Management Digital Coast database, to build the new grids.
2. Spectral resolution will be increased to expand the resolved

frequency range internally to 1Hz, matching the GLW spectral range extent to that of other wave models, allowing later introduction of more advanced physics packages.

3. Increased resolution of input wind fields from NAM atmospheric model smartinit files will allow improved resolution of wind fields from current 12km to the 4km NAM nest data, with expected impacts to storm wave forecasting and nearshore wave growth.

4. The increased resolution of the input wind fields will delay the GLW runs by 40 to 50 minutes.

5. Improved ice concentration analysis will result in better representation of ice coverage during winter months, which will render the model a more realistic representation of areas in the lakes basins exposed to waves.

6. Extension of forecast range in the GLWN runs to 147h addresses Weather Forecast Offices request to fulfil their mission of providing forecasts up to that range.

7. Upgrade to the latest WAVEWATCH III code follows regular procedure to bring all wave models towards using the latest available technology.

#### Output Product Changes

##### NCEP FTP/HTTP Server:

New output files using the native curvilinear Lambert conformal wave model grid at 2.5km resolution will replace the existing 4km resolution files. The new 2.5km resolution files will also have a new naming convention.

##### - New 2.5km Datasets

glw.tCCz.grlc\_2p5km.grib2 - NAM smartinit forcing  
glwn.tCCz.grlc\_2p5km.grib2 - NDFD forcing

##### - Removed Datasets

glw.grl.tCCz.grib2 - 4km wave grid, NAM forcing  
glwn.grl.tCCz.grib2 - 4km wave grid, NDFD forcing

glw.grl.tCCz.ice - 4km wave grid, NAM forcing ice binary  
glw.grl.tCCz.restart - 4km wave grid, NAM forcing restart binary  
glw.grl.tCCz.wind - 4km wave grid, NAM forcing wind binary  
glwn.grl.tCCz.ice - 4km wave grid, NDFD forcing ice binary  
glwn.grl.tCCz.restart - 4km wave grid, NDFD forcing restart binary  
glwn.grl.tCCz.wind - 4km wave grid, NDFD forcing wind binary

##### NOMADS:

The existing 4km wave grid GLW/GLWN datasets available via DODS and Grib Filter will be transitioned to use the 2.5km datasets.

#### NOAAPORT/SBN:

4km wave grid datasets from the late run GLWN will continue to be disseminated via AWIPS for use by NWS Weather Forecasting Offices (WFOs). The grids will eventually be replaced in AWIPS by the 2.5km curvilinear wave grid datasets and phased out in a subsequent GLW system upgrade expected to occur in mid-2015.

#### Data Availability

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/dev/>

Details about the NCEP Wave Models are found online at:

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

A consistent parallel feed of data is available on the NCEP server 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:

Hendrik Tolman  
NCEP/Marine Modeling and Analysis Branch,  
College Park, Maryland  
301-683-3748  
[hendrik.tolman@noaa.gov](mailto:hendrik.tolman@noaa.gov)

For questions regarding the dataflow aspects of these data sets,

please contact:

Justin Cooke  
NCEP/NCO Dataflow Team  
College Park, Maryland 20746  
301-683-3833  
ncep.list.pmb-dataflow@noaa.gov

NWS National Technical Implementation Notices are online at:

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

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