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Technical Implementation Notice 13-25
National Weather Service Headquarters Washington DC
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From: Tim McClung
Science Plans Branch Chief
Office of Science and Technology

Subject: Change to Great Lakes Wave Model Physics:
Effective October 1, 2013

On or about October 1, 2013, beginning with the 1200 Coordinated Universal Time (UTC) cycle, the National Centers for Environmental Prediction (NCEP) will introduce a physics upgrade to the Great Lakes Wave Model, which will affect both the early and late model runs GLW and GLWN.

The key changes for the Great Lakes system are as follows a new physics package for wave growth under wind seas and for wave dissipation due to wave breaking.

The new physics packages are outlined in Ardhuin et al. 2010. A validation study made using NCEP's Great Lakes wave models is presented in Alves et al., 2013 (see full reference below). The latter work shows that the new physics significantly improves model skill for wave height, especially in regions of strong storm wind forcing. This will be reflected by crucial improvements in forecast performance for extreme wave prediction, a systematic problem in previous GLW/GLWN systems. Correction will boost usage of the system by Great Lakes WFOs. All output products will remain unchanged.

With this implementation, the location of the output data on the ftp servers will be changed. Data are currently available in a general directory named "wave." With this implementation, the GLW and GLWN will be put in a directory named "glw." The full directory paths are listed below.

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

<http://www.ftp.ncep.noaa.gov/data/nccf/com/wave/prod/glw.YYYYMMDD>

and

<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/wave/prod/glw.YYYYMMDD>

and on NOMADS at

<http://nomads.ncep.noaa.gov/pub/data/nccf/com/wave/prod/glw.YYYYMMDD>

where YYYYMMDD is the 4-digit year, month and day. Note that prior to the implementation the data are available in [../com/wave/prod/wave...](http://nomads.ncep.noaa.gov/pub/data/nccf/com/wave/prod/wave...)

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 once the model is running in parallel on the NCEP Central Computing System in early September. The parallel data will be available via the following URLs:

<http://www.ftp.ncep.noaa.gov/data/nccf/com/wave/para/glw.YYYYMMDD>

<ftp://ftp.ncep.noaa.gov/pub/data/nccf/com/wave/para/glw.YYYYMMDD>

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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References:

Alves et al., 2013: The Operational Implementation of a Great Lakes Wave Forecasting System at NOAA/NCEP. Weather and Forecasting, early online release:
<http://journals.ametsoc.org/doi/abs/10.1175/WAF-D-12-00049.1>.

Ardhuin, F. et. al., 2010: Semi-empirical dissipation source functions for ocean waves: Part 1, definition, calibration and validation. J. Phys. Oceanogr., 40, 1917-1941.

NWS technical implementation notices are online at:

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

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