

March 27, 2012

MEMORANDUM FOR: NCEP Model Implementation Scientific Review Team

FROM: Chris Caruso Magee, Team Lead, Production Control
Production Management Branch, NCEP Central Operations

SUBJECT: Proposed Implementation of Global Multi-grid Wave Model V3.0.0

The Environmental Modeling Center (EMC) has proposed implementation of the Global Multi-grid Wave Model V3.0.0. This system will run 4 cycles per day within the NCEP Production Job Suite. This upgrade includes changes in the wave physics which address known biases in the Global Multi-grid Wave Model and should significantly improve model skill scores.

The upgrade includes :

- a new physics package for wave growth under wind seas,
- a new physics package to account for swell dissipation for swells propagating long distances,
- a new physics package for wave dissipation due to wave breaking.

The new physics packages are outlined in Ardhuin et al 2010 (see full reference below). Validation studies show that the new physics significantly improve model skill for wave height, especially in regions of strong swells such as the Pacific.

The majority of the output products will remain unchanged.

The number of stations available in the point output products will be reduced by 112. The stations that are being removed are – WALLOPS_?? (ranging from 01 to 61) and SANCLEM_?? (ranging from 01 to 51). These stations were added in an experimental mode and are now being removed. In addition, the spectral output files will now be compressed due to their large sizes. The uncompressed files, including the multi_1.txxz.spec_tar file will be removed from the NCEP server. Any downstream users that are actively using these spectral output files will need to adapt their software to use the compressed versions. Note that while the tar files are being compressed, the individual spectral files inside the respective tarballs will not be compressed.

Near real time parallel data:

Beginning Tuesday, March 27, 2012 and starting with the 1200Z cycle, a consistent parallel feed of data will be available at:

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

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

where YYYYMMDD is year/month/day.

The files that will be compressed are:

akw.txxz.spec_tar becomes akw.txxz.spec_tar.gz
enp.txxz.spec_tar becomes enp.txxz.spec_tar.gz
wna.txxz.spec_tar becomes wna.txxz.spec_tar.gz

The file multi_1.txxz.spec_tar will be removed. The file multi_1.txxz.spec_tar.gz has been available on the server for some time.

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>

NOTE 1: These changes will only correspond to the global wave model (multi_1). Upgrade of the hurricane wave model (multi_2) will occur at a later date.

The Technical Information Notice for this upgrade is pending. NCO's Production Management Branch will post the TIN number on the following website as soon as the TIN is published:

<http://www.nco.ncep.noaa.gov/pmb/changes>

Request for Evaluation

Please complete the attached "Intent to Participate" form and return to Chris.Caruso.Magee@noaa.gov no later than March 30, 2012. NCO requires an intent form be filed by all NCEP Service Centers. OPC and NHC are listed in the Charter as being the Service Centers primarily responsible for this evaluation. All other Service Centers are optional, as are any other WFOs, NWS Regions, government agencies, or private companies not listed above. For the NCEP Service Centers, if, in your estimation the nature of the proposed change would have little or no impact on the forecast process at your Service Center, simply indicate that you do not intend to participate in the subjective evaluation and return the form.

The 30-day evaluation period will start at 12Z on Tuesday, March 27, 2012 and run through April 26, 2012. Participants need to complete the attached "Model Implementation Subjective Evaluation Report" form and return to Chris.Caruso.Magee@noaa.gov no later than April 30, 2012. Please indicate the overall performance of the product, with any additional comments on specific cases with noteworthy positive or negative performance. Please note that NCO requires evaluators to specifically address the benefits stated in the attached form as to whether those benefits were observed or not. Any feedback you wish to provide during the evaluation period should be emailed to Chris.Caruso.Magee@noaa.gov.

A final coordination teleconference will be scheduled to review the evaluation and address any outstanding issues. Based on the outcome of that teleconference EMC and NCO will prepare a recommendation for Dr. Uccellini (NCEP Director). This teleconference has not yet been scheduled. The tentative implementation date for this upgrade is May 8, 2012.

Points of Contact

Chris.Caruso.Magee@noaa.gov (NCO)

Hendrik.Tolman@noaa.gov (EMC)

Arun.Chawla@noaa.gov (EMC)

Reference

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

Intent To Participate

Model Implementation Subjective Evaluation

Scientific Review Team Member: _____

Team Member E-mail: _____

Region, Service Center Company Representing: _____

**(Govt Only) Authorizing Official or
Service Center Director:** _____

Intent to Participate:

____ Will Participate in the Evaluation

____ Will Not Participate in the Evaluation

Scientific Review Team Member: _____

Region, Service Center or Company Representing: _____

Proposed Change: Global Multi-grid Wave physics upgrade

Model Developer: Hendrik Tolman (EMC) and Arun Chawla (EMC)

Real-Time Parallel Runs:

General comments: _____

Direct comparison of operational and proposed change:

Evaluation of expected benefits:

Do you observe the following and are they beneficial to you?

1. Do you notice a significant reduction in the model biases when compared to the current Global Multi-grid Wave Model?

2. Do you notice a significant improvement in model skill for wave height, especially in regions of strong swell such as the Pacific?

Recommendation:

Implement as proposed ____

Reevaluate after changes ____

Do not implement ____