

March 22, 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 Ensemble Kernel Density Model Output
Statistics V1.0.0

The Meteorological Development Laboratory (MDL) has proposed implementation of the Ensemble Kernel Density Model Output Statistics (EKDMOS) V1.0.0. This system will run 2 cycles per day (0000Z, 1200Z) within the NCEP Production Model Suite. EKDMOS applies the statistical post processing techniques of MOS to Ensemble Forecast Systems (EFS) to produce forecast probability distributions that are reliable and accurate. The EKDMOS technique (Glahn 2009) includes MOS, error variance estimation, kernel density estimation, and spread-skill relationships. The EFS used is the North American Ensemble Forecast System (NAEFS).

The initial implementation of this project will provide probabilistic guidance for temperature, dewpoint, daytime maximum temperature, and nighttime minimum temperature for the CONUS and Alaska. Additional weather elements and domains will be included in subsequent implementations. Gridded forecasts will be produced for the ensemble mean as well as the following non-exceedance probability levels: .05, .10, .20, .30, .40, .50, .60, .70, .80, .90, and .95.

The EKDMOS includes :

- Apply MOS equations, derived from the ensemble means of the individual ensemble forecasts systems, to each member of the Global Ensemble Forecast System (GEFS) and the Canadian Meteorological Centre's Ensemble (CMCE) for 2303 stations spanning the CONUS, Alaska, Hawaii, Canada, and Puerto Rico
- Use kernel density fitting to combine all GEFS and CMCE members into a probability density function (PDF)
- Use a spread-skill relationship to produce a more reliable PDF
- Convert the PDF into a cumulative distribution function (CDF)
- Create gridded analyses from 11 points on the CDF and encode in grib2 for the CONUS and Alaska
- Make grib2 files available in the National Digital Guidance Database (NDGD) via the Telecommunication Gateway's File Transfer Protocol (TGFTP) server
- GEMPAK
- HPSS archives
 - Station-based forecasts
 - Grib2 files

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:

FTP:

tgftp.nws.noaa.gov

Alaska output: SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.mosekd/AR.alaska
CONUS output: SL.us008001/ST.expr/DF.gr2/DC.ndgd/GT.mosekd/AR.conus

Sample output files and details about the EKDMOS are online at:

http://www.mdl.nws.noaa.gov/~naefs_ekdmos

A Public Information Statement for the EKDMOS may be viewed at:

<http://www.nws.noaa.gov/os/notification/pns12edkmos.htm>

(The PNS address is correct despite the spelling).

Request for Evaluation

Please complete the attached "Intent to Participate" form and return to Chris.Caruso.Magee@noaa.gov no later than March 28, 2012. NCO requires an intent form be filed by all NCEP Service Centers. HPC and CPC were listed as being the Service Centers primarily responsible for this evaluation. The NWS Regions, OAR, and OHD are also recommended participants. All other Service Centers are optional, as are any other WFOs, 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 MDL and NCO will prepare a recommendation for Dr. Uccellini (NCEP Director). This teleconference has not yet been scheduled.

Points of Contact

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

John.L.Wagner@noaa.gov (MDL)

**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: EKDMOS

Model Developer: John L. Wagner (MDL)

Real-Time Parallel Runs:

General comments: _____

Evaluation of expected benefits:

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

1. Is the ensemble-based statistical post-processed guidance provided to the National Digital Guidance Database reliable and accurate?

Recommendation:

Implement as proposed ____

Reevaluate after changes ____

Do not implement ____