

The Environmental Modeling Center's Model Evaluation Group

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The Environmental Modeling Center (EMC) Model Evaluation Group (MEG) formed in the spring of 2012. Inspired by ongoing model evaluation efforts at the European Center for Medium-Range Weather Forecasts (ECMWF), the MEG's goal was to evaluate EMC model performance in a more comprehensive and organized way than had been previously done. The MEG has been a major success in its first three years; several model problems and errors have been noted, brought to the attention of modeling teams and customers, and then thoroughly investigated by developers. Many of the problems, such as the GFS cold/wet bias, SREF initialization, and the initialization of snow cover in several EMC models, have been corrected or at least mitigated in operations. The MEG has also performed thorough post-mortems of high-impact and sometimes poorly-forecast events such as Superstorm Sandy, the June 2012 Ohio Valley-Mid-Atlantic derecho and recent winter storms. Lines of communication have been opened between EMC and the National Centers, the NWS offices, and private customers to alert them of model biases and issues and provide a forum for users to report problems they have seen in EMC forecast systems.

The MEG currently monitors the models in the short (1-3 day) and medium (day 4 and beyond) range periods. In the short-range, the North American Mesoscale (NAM) and its nests, the Short Range Ensemble Forecast (SREF) system, the Rapid Refresh (RAP) and the High-Resolution Rapid Refresh (HRRR), the High-Resolution Windows (HIRESW), and the Hurricane WRF (HWRF) are closely watched. In the medium-range, the GFS, the ECMWF model, the Global Ensemble Forecast System (GEFS), and other international models are evaluated.

The evaluations consist of day-to-day monitoring of real-time forecasting issues and post-mortems of major events as well as reviewing longer-term statistical measures and regional and global mean and anomaly fields. The short-range evaluations have focused primarily over CONUS, while the medium-range evaluations have focused primarily over North America, but with some limited examination of the entire globe. Both have made extensive use of existing verification and graphics within EMC and in the broader community.

As the field has become familiar with the existence of the MEG, the frequency of customers coming to the MEG with inquiries or requests for examinations of cases/issues has rapidly increased. The MEG assisted with evaluations of parallel versions of models being prepared for implementation.

The current effort features weekly teleconference briefings. The MEG pays considerable attention to NWS regional and local forecasters and to other NCEP centers; people from other NCEP centers, NWS regional and field offices and other agencies in NOAA have made presentations in MEG and people from the private sector participate.

The primary target of the MEG is enhanced model development. Its purpose is to evaluate EMC models and help model developers improve the models. Another purpose is to provide information to the users about the performance of the EMC models and about proposed changes to the models.

It is hoped that in the future the MEG will help develop a more integrated science-technology structure in which EMC forecast system developers work as one team with NWS forecasters to develop improved forecasts.