IFPS Science Steering Team (ISST)
Introduction to Gridded MOS

Introduction: The Meteorological Development Lab (MDL) has developed gridded MOS (5 km grid spacing) for the CONUS, which will be available with AWIPS OB7.1 (delivery beginning in October 2006). The ISST has created this document to share gridded Model Output Statistics (MOS) information learned from MDL and field evaluation sites to briefly educate field forecasters about what to expect (and what not to expect) from gridded MOS upon delivery.

What gridded MOS is and is not: Gridded MOS is a synoptic-scale guidance package available on a meso-scale (i.e., 5 km NDFD) grid. *It is not a meso-scale MOS package*. Gridded MOS is still undergoing considerable development, so expect frequent enhancements.

How gridded MOS is generated: For all current weather elements except thunderstorms, MOS guidance is generated at stations from the traditional single-station**,** or regional prediction equations. The station guidance is then analyzed to the 5 km NDFD grid. For temperature and dew point, the analysis includes an elevation adjustment scheme. The first guess for the analysis could be direct model output, an average value over the entire grid, or a guidance value obtained by applying a MOS generalized-operator equation at each of the 5 km NDFD grid points. Next, the analyzed field is smoothed, and all fields of the gridded data are "nudged" toward the point-based MOS data. The analysis method over marine gridpoints is completely separate from that used over land. Thus the gridded MOS at the land-sea boundary may show a large gradient. For thunderstorms, generalized-operator equations are applied on a coarser-resolution grid and the subsequent guidance is interpolated to the 5 km NDFD grid.

Current weather elements available from gridded MOS: Wind speed and direction, T, T_d, MaxT, MinT, RH, PoP12 and probability of thunder out to 7 days.

Strengths of gridded MOS: Gridded MOS has no discontinuities at WFO boundaries. It is designed to have a level of accuracy comparable to station-based MOS, while being mapped to the NDFD 5 km grid.

Deficiencies of gridded MOS: Gridded MOS is based on synoptic-scale guidance. PoP12 fields are smoother than the current method of matching point-based MOS guidance to a model grid. With other fields, such as temperature, there is "bumpiness" due to the scarcity of point-based forecast points and the elevation-adjustment algorithms. Away from traditional point-based MOS locations, gridded MOS will be less accurate. As with point-based MOS, gridded MOS trends toward the sample mean in later time periods.

Instances when gridded MOS should be used with caution: In complex terrain away from point MOS locations, where winds may be completely unrepresentative; At the land-sea interface, because separate analyses are done for land and for water; In strong surface-based inversions (e.g., marine layer or Great Basin High); and in extreme or very rare events, as with point-based MOS.

Future MDL gridded MOS plans: MDL plans to verify gridded MOS against the Real-Time Mesoscale Analysis, beginning April 2007. Sky cover, precipitation type, QPF, snowfall amount and wind gust grids will be added for CONUS users in March 2007. Implementation in Alaska is planned by September 2007, with Hawaii, Guam and Puerto Rico to follow by September 2008. MDL will also be transitioning to a 2.5 km grid over the next several years.

The ISST recommends that all forecasters attend the gridded MOS teletraining session available from the VISIT.