

CENTRAL REGION TECHNICAL ATTACHMENT 88-3

MOS GUIDANCE ... CAN IT GET MUCH BETTER?

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For over a decade Indianapolis has been verifying the local forecast high and low temperature against Model Output Statistics (MOS) for the first three periods of the forecast. Frequently, forecasters were able to improve on MOS forecasts. Several forecasters have shared their observations on how to improve on numerical output. The Techniques Development Laboratory (TDL) in Washington has noted in their Technical Procedures Bulletins how forecasters can improve on MOS.

Formerly MOS maximum and minimum temperature predictions were for calendar day and, forecasters could, on occasion, easily out-forecast the model output temperatures. Carefully timing a frontal passage or closely scrutinizing the three-hourly temperatures helped forecasters make large improvements over numerical guidance.

However, since December 1985, MOS has been programmed to supply daytime maximum and nighttime minimum guidance and forecasters no longer have the "gift" opportunities to beat MOS. Rather, the game is now played on equal terms with the computer and beating numerical guidance is a matter of skillful interpretation of satellite data, prog charts and mesoscale analysis.

Statistics kept here in Indianapolis clearly illustrate the vast improvement of MOS, particularly in the cold season. Between October 1982 and November 1985 the local office was able to average a monthly overall improvement to MOS of 0.82 degrees. Large gains were frequently made in November, December and January (see table on page two).

Since December of 1985 the numbers reflect the improved quality of MOS forecasts. From December 1985 through September 1987 the local office averaged an improvement over MOS of only 0.30 degrees on a monthly basis.

On the other hand, the local office made some big improvements over MOS of maximum/minimum forecast during the October 1982-November 1985 time period:

<u>October 1982-November 1985</u>		<u>December 1985-September 1987</u>	
1.5	December 1982	0.9	November 1986
2.1	January 1983	0.5	December 1986
2.4	December 1983	0.7	January 1987
1.6	January 1984	0.7	July 1987
1.8	November 1985.		

In all other months (December 1985 - September 1987) improvements of a monthly average error was less than a half (0.5) of a degree.

It is clear that MOS temperature forecasts have reached a level of sophistication that taxes the forecaster's skill. Still, forecasters can make significant short term improvements by close attention to trends and mesoscale details. It is not so critical that a degree or two be shaved here and there. Rather, the key is to successfully forecast those cases that MOS misses by greater than five degrees. These typically are the weather situations that have the biggest impact on the public.