Western Region Technical Attachment
No. 90-34
September 25, 1990

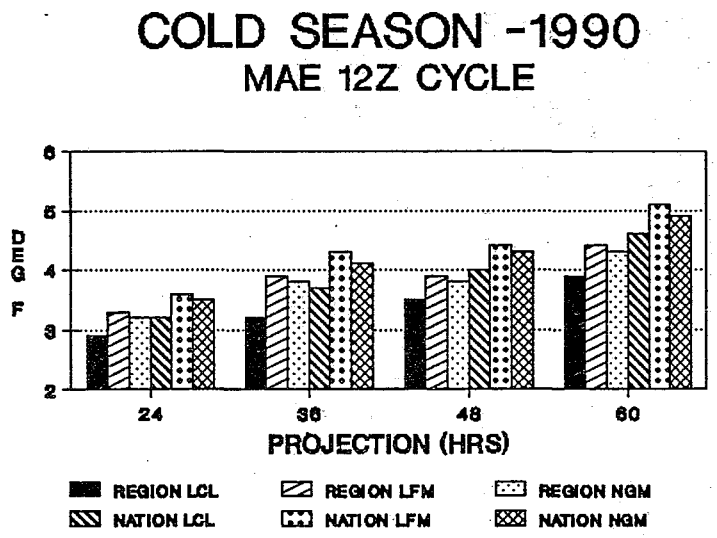
LFM IN THE NORTH, NGM IN THE SOUTH?

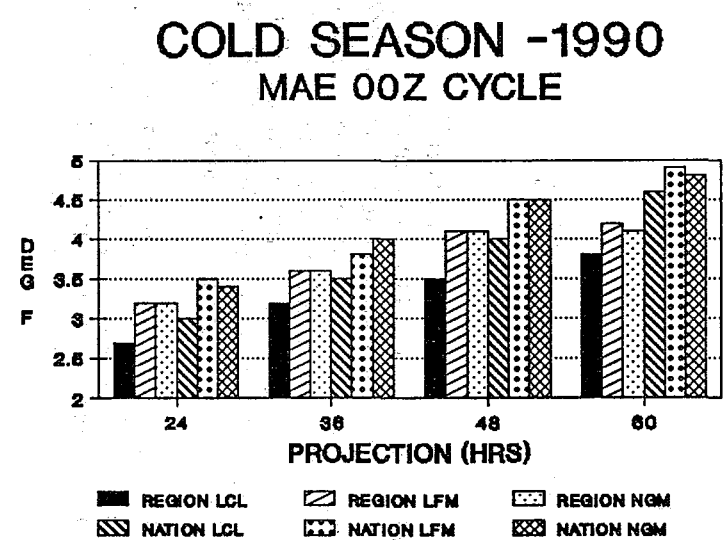
In Western Region Technical Attachment 90-28, we noted in passing that overall, for the past cold season (October 1989 through March 1990), the NGM MOS guidance was very competitive with LFM MOS in the Western Region. Figure 1 shows that for both the 12Z and 00Z cycles, the NGM MOS temperature guidance had as good or better mean absolute error (MAE) scores as the LFM MOS. In fact, the NGM was superior for all projections from the 12Z cycle. The lower two bar graphs in Fig. 1 show that when changes of 10 degrees F or more were forecast, or occurred, the NGM MOS guidance had lower MAE for minimum temperatures, while the LFM had lower MAE for maximum temperatures.

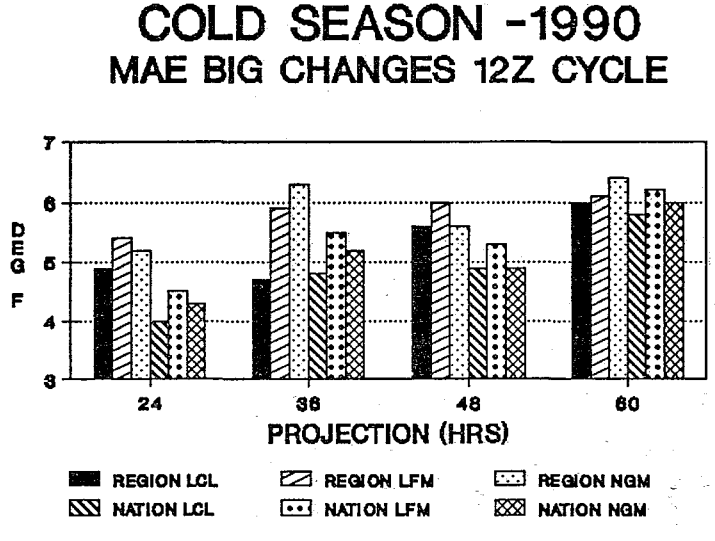
Figure 2 shows that Brier scores for the NGM and LFM MOS POP guidance were very similar for the Western Region this past cold season. It is interesting to note that the lower two bar graphs in Fig. 2 suggest forecasters had greater success in deviating from LFM MOS POPs by 20 percent or more than deviating from NGM guidance.

In looking at how NGM and LFM guidance performed <u>within</u> the Western Region an interesting pattern surfaced. Figure 3 depicts which guidance suite we judged to be "better" at each AFOS Era Verification (AEV) site overall throughout the cold season. For temperatures, we looked first at MAE, then percent of forecasts which had a 5 degree F or lower error, and finally MAE for big change events. Based on this somewhat subjective assessment, Fig. 3 shows that the LFM provided better guidance for the northern portion of the region, while the NGM did better in the south for both maximum and minimum temperatures. Additionally, Fig. 3 shows that this north-south stratification was also generally true for POP guidance. In the case of POPs, we looked first at Brier scores, then mean POP for precipitation cases, and mean POP for non-precipitation events. Note that for Seattle and Spokane, even with this loose subjective method, we were unable to declare which guidance was "better".

The above assessment should not be used to draw conclusions about individual events, nor necessarily about how LFM and NGM MOS guidance will perform this upcoming cold season. It does suggest, however, that the upstart NGM suite, based only on three years of developmental data and a two-season system of equations, should not be ignored -- especially over the southern half of the Western Region.


COLD SEASON -1990
MAE 12Z CYCLE
DEG F
6
5
4
3
2
24
36
48
60
PROJECTION (HRS)
REGION LCL
REGION LFM
REGION NGM
NATION LCL
NATION LFM
NATION NGM


COLD SEASON -1990
MAE 00Z CYCLE
DEG F
5
4.5
4
3.5
3
2.5
2
24
36
48
60
PROJECTION (HRS)
REGION LCL
REGION LFM
REGION NGM
NATION LCL
NATION LFM
NATION NGM


COLD SEASON -1990
MAE BIG CHANGES 12Z CYCLE
DEG F
7
6
5
4
3
24
36
48
60
PROJECTION (HRS)
REGION LCL
REGION LFM
REGION NGM
NATION LCL
NATION LFM
NATION NGM

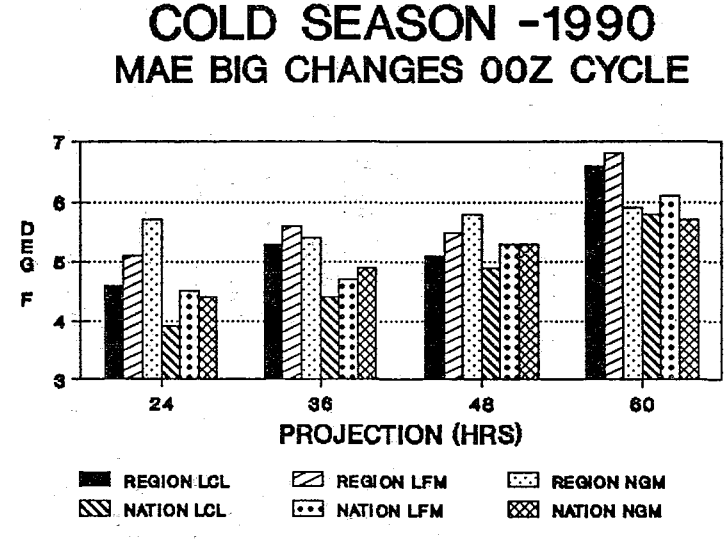
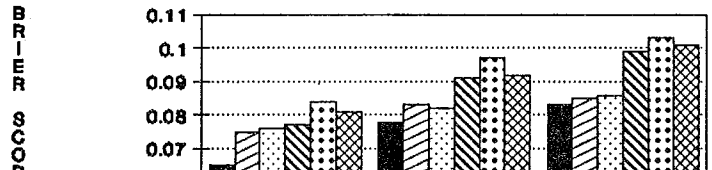

COLD SEASON -1990
MAE BIG CHANGES 00Z CYCLE
DEG F
7
6
5
4
3
24
36
48
60
PROJECTION (HRS)
REGION LCL
REGION LFM
REGION NGM
NATION LCL
NATION LFM
NATION NGM

Figure 1

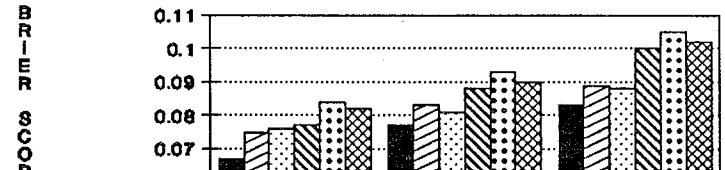
COLD SEASON 1990
BRIER SCORES 12Z



	24	36	48
REGION LCL	0.065	0.078	0.083
REGION LFM	0.075	0.083	0.085
REGION NGM	0.076	0.082	0.086
NATION LCL	0.077	0.091	0.099
NATION LFM	0.084	0.097	0.103
NATION NGM	0.091	0.092	0.101

PROJECTION (HRS)

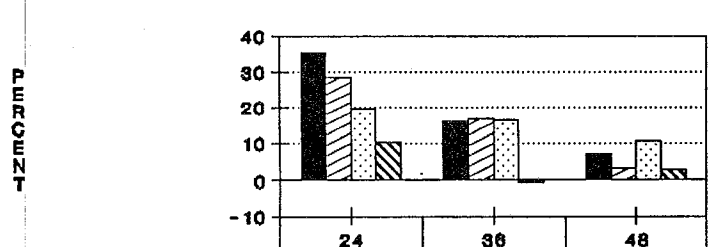
COLD SEASON 1990
BRIER SCORES 00Z



	24	36	48
REGION LCL	0.067	0.077	0.083
REGION LFM	0.075	0.083	0.089
REGION NGM	0.076	0.081	0.088
NATION LCL	0.077	0.086	0.1
NATION LFM	0.084	0.093	0.105
NATION NGM	0.082	0.09	0.102

PROJECTION (HRS)

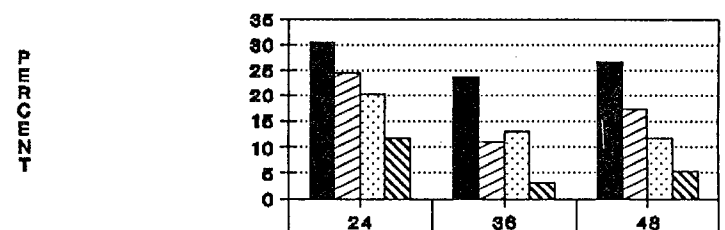
COLD SEASON 1990
% IMPVMT OVR MOS BRIER WHEN CHANGE >=20 % (12Z



	24	36	48
REGION LCL VS LFM	35.2	16.1	7.3
REGION LCL VS NGM	28.4	16.7	3.3
NATION LCL VS LFM	19.5	16.3	10.9
NATION LCL VS NGM	10.3	-0.7	3.1

PROJECTION (HRS)

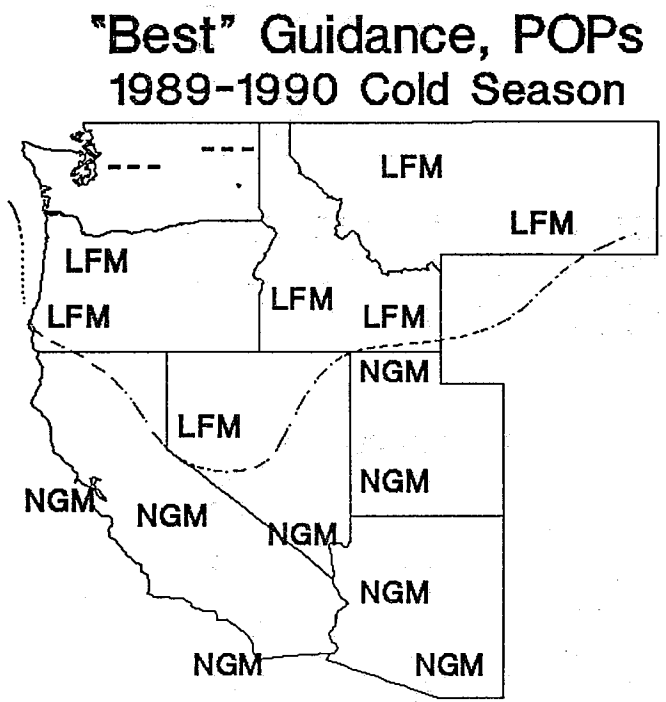
COLD SEASON 1990
% IMPVMT OVR MOS BRIER WHEN CHANGE >=20 % (00Z

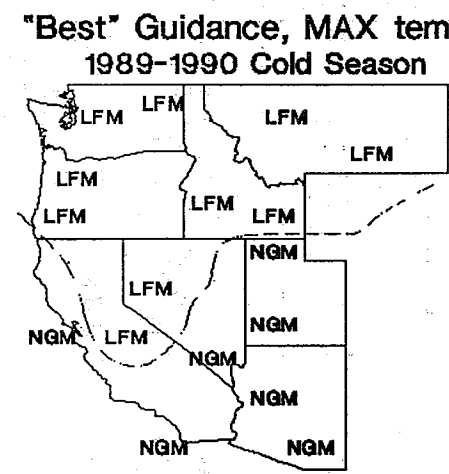


	24	36	48
REGION LCL VS LFM	30.4	23.8	26.6
REGION LCL VS NGM	24.5	11.1	17.3
NATION LCL VS LFM	20.3	13	11.9
NATION LCL VS NGM	11.8	3.1	5.3

PROJECTION (HRS)

Figure 2


"Best" Guidance, POPs
1989-1990 Cold Season
LFM
LFM
LFM
LFM
LFM
LFM
NGM
LFM
NGM
NGM
NGM
NGM
NGM
NGM
NGM


"Best" Guidance, MAX temps
1989-1990 Cold Season
LFM
LFM
LFM
LFM
LFM
LFM
LFM
LFM
NGM
LFM
NGM
NGM
LFM
NGM
NGM
NGM
NGM

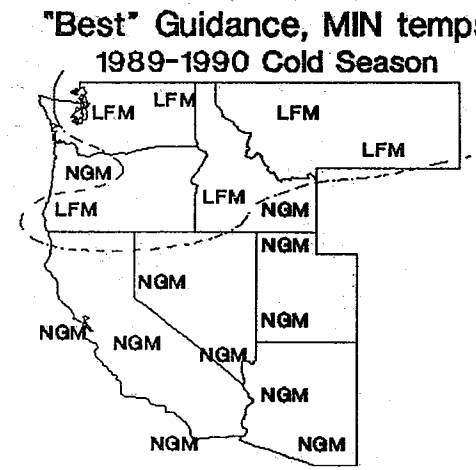

"Best" Guidance, MIN temps
1989-1990 Cold Season
LFM
LFM
LFM
LFM
NGM
LFM
LFM
NGM
NGM
NGM
NGM
NGM
NGM
NGM
NGM
NGM
NGM

Figure 3