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MOS VS. NGM-PERFECT PROG GUIDANCE

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Perfect Prog forecasts based on the NGM model were first available to field offices on May 13, 1987. At that time, an administrative message was sent from NMC stating that Perfect Prog guidance would be better than LFM-MOS guidance in "some" situations. As with any new forecast tool, it takes time to discover which situations those are. For that purpose, verification was performed for the first three months (mid May-mid Aug) of probability of precipitation (POP) and temperature forecasts of both statistical forecast sets (LFM-MOS vs. NGM-Perf. Prog) for Seattle (SEA) and Spokane (GEG), Washington.

Table 1 is the POP Brier Score verification, and Figure 1 is the reliability plot. On the average, the LFM-MOS was best at SEA (west of the Cascade mountains) while the NGM-Perf Prog was best (but by a lesser amount) at GEG (east of the Cascades). Of interest is that for both locations, the NGM-Perf Prog is the "wetter" of the two guidance sets. It should be pointed out that for the verification period, SEA had a lower than normal frequency of precipitation while the GEG frequency was slightly higher than normal.

Table 2 shows the temperature verification results. As shown to be the case nationally (Carter, 1987), the NGM-Perf Prog guidance has a larger error and an overall cold bias that increases with increased projection time.

The author (and others) has noticed that the LFM-MOS maximum temperature forecasts are usually too warm during precipitation episodes. In hopes of finding the perfect prog technique better in these situations, a separate verification was performed for precipitation-only events (cases where rainfall occurred during the 00z-12z period for minimums and during the 12z-00z period for maximums). Table 3 shows these results. It does confirm the LFM-MOS warm bias. The NGM-Perf Prog no longer showed a cold bias, but now has a warm one. It did a better job overall; having a smaller bias and average absolute error than did the LFM-MOS.

Although no strict conclusions can be made from a limited sample such as this, some tendencies do stand out. It does appear that POP forecasts from the NGM-Perf Prog can be better than the LFM-MOS over a relatively long period of time. The NGM-Perf Prog does have an overall cold bias, but the absolute error and warm bias are less than the LFM-MOS in precipitation episodes.

Reference:

Carter, G., 1987: "Comparative Verfication of NGM-based Perf Prog Forecasts", Western Region Technical Attachment No. 87-26, August 4, 1987.

Brier Score

		LFM-MOS	NGM-Perf Prog	
SEA	period 1	6.53	7.86	
	" 2	7.50	9.33	(177 forecasts for
	" 3	7.60	11.60	each period)
GEG	period 1	11.62	10.79	
	" 2	12.15	11.00	(180 forecasts for
	" 3	13.94	12.13	each period)

Number of times a POP >= 60% was forecast

SEA
- LFM 12 (no 100% forecasts)
- NGM 66 (including 9 100% forecasts)

GEG
- LFM 9
- NGM 34

TABLE 1

Temperature errors - all cases

		LFM-MOS		NGM-PERF PROG	
		BIAS	ABSOLUTE ERROR	BIAS	ABSOLUTE ERROR
SEA	period 1	-.35	2.42	-.01	2.58
	" 2	-.14	2.71	-.67	2.78
	" 3	-.08	2.77	-1.20	3.04
	" 4	.34	3.11	-1.52	3.13
GEG	period 1	-.23	2.58	.02	3.12
	" 2	.54	2.88	-.95	3.51
	" 3	.20	3.04	-1.75	3.96
	" 4	.94	3.83	-2.44	4.20

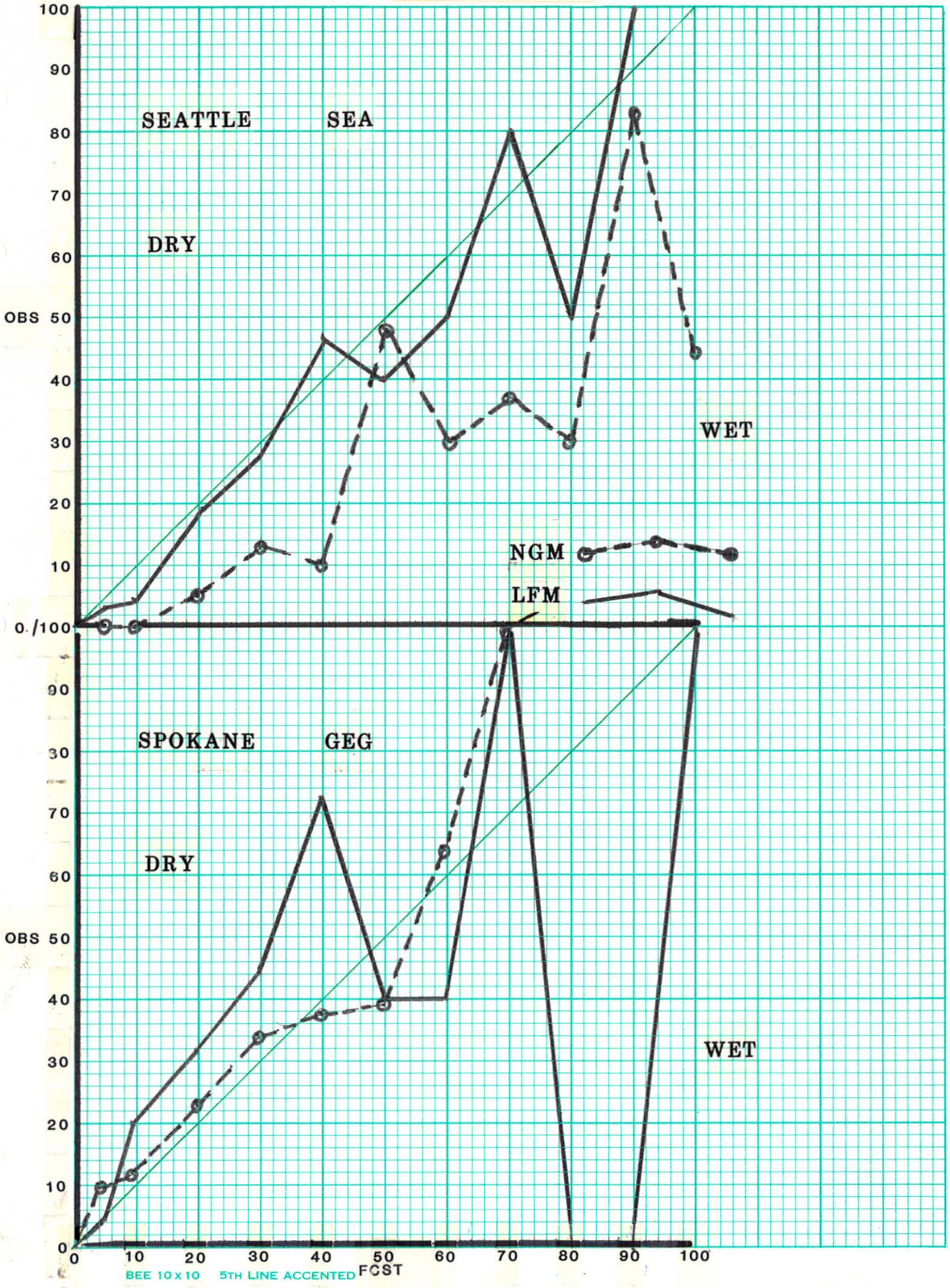
TABLE 2

Temperature errors - precipitation cases only

		LFM-MOS		NGM-PERF PROG	
		BIAS	ABSOLUTE ERROR	BIAS	ABSOLUTE ERROR
SEA	period 1	.11	2.22	.67	2.67
	" 2	1.21	2.58	05	2.47
	" 3	1.94	2.65	.35	2.24
GEG	period 1	1.90	3.63	2.13	4.33
	" 2	3.39	4.80	2.54	4.16
	" 3	2.69	4.19	1.63	3.44

TABLE 3

FIGURE 1.


SEATTLE
SEA
DRY
WET
NGM
LFM
SPOKANE
GEG
DRY
WET
OBS
FCST
0./100
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10
20
30
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100
BEE 10 X 10 5TH LINE ACCENTED