

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE
NATIONAL METEOROLOGICAL CENTER

OFFICE NOTE 269

1-2 Day Comparative BWB and LFM Threat Scores, No
Precipitation Threat Scores, and Bias for 1982

Warren Smith
Forecast Division

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This is an unreviewed manuscript, primarily
intended for informal exchange of information
among NMC staff members.

INTRODUCTION

Basic Weather keeps a continuous record of precipitation threat scores, no precipitation threat scores, and bias for a 60 station network for comparative purposes dating back to 1971. The bias scores ($\frac{P}{O}$) began in 1972 for 24-12 hrs. and 1975 for 36-12 hrs. The LFM POPS scores are included in the yearly comparative statistics for the first time in 1982, but we have been looking at them daily and monthly since they started. Basic Weather selects a POP station as a categorical pick (.01"/12-hr.period) if the POP "chance" is 45% or greater.

These records are kept to evaluate the effectiveness of the "man" and the guidance monthly, seasonally, yearly and longer in order to evaluate objectively how the "man" and the model, including the LFM POPS, compare and to see if changes in the model are positive or negative relating to precipitation output.

1-2 Day Comparative BWB and LFM Threat Scores, T_SNP
and Bias for 1982

In 1982, the record continues to show the 1-2 day forecasters improving on the LFM precipitation guidance in all categories, improving on the LFM POPS in most categories during the colder months and showing superior forecasting skills over the POPS in the warmer months (May-October) except for the T_SNP. The POPS T_SNP scores are better because, on the average, the POPS continually underforecast precipitation events except for the high probability ones. In the warmer months, Basic Weather progs should certainly be used instead of the POPS for precipitation probabilities. Categorical precipitation picks in 1-2 day (.01"/12-hr. period) are usually enclosed in a broken area with the appropriate rain, drizzle, snow, or freezing precipitation symbol.¹

Broken down, this record continues to show that the "man" (LFM vs. Basic Weather) is picking fewer stations and putting them into the correct rain/no rain categories more often than the model; and when moisture changes are made to the model to "dry out" the bias,² the "man" continues to show improvement. (See monthly verification score sheet.) The LFM model bias is still too high, higher than last year by 21% at 36-12 hrs. and 17% at 24-12 hrs. By contrast the Basic Weather forecasters only increased their bias by 6% at 36-12 hrs. and 4% at 24-12 hrs. The POPS bias is too low from May thru October and ridiculous in July and August.

Looking at this record one certainly gets impressed with the results of modifying the LFM guidance. The 1-2 day forecasters did a great job in "82" overcoming the loss of two forecasters out of four, one in January and the other in December.

The 1-2 day forecasters can improve on their forecasts using the LFM POPS, but not by continually underforecasting. The POPS T_SNP scores are great but the rest of the picture is not, especially T_SP and Bias during the warmer months.

¹ Smith, Warren, April 1982: Some Aspects of 1-2 Day Forecasting and Verification, pgs. 4 and 5, APT Course, April 1982.

² Moisture changes were made to the LFM in March and August 1982.

TABLE #1

Comparative BWB and LFM (including POPS) Precipitation

Scores for 1982. Threat Scores and Bias for

36-12 and 24-12 Hours

1No	36-12						24-12						
	LFM		BW		(LFM) POPS		LFM		BW		(LFM) POPS		
	T.S.	BIAS	T.S.	BIAS	T.S.	BIAS	1No	T.S.	BIAS	T.S.	BIAS	T.S.	BIAS
J 62	39.54	1.72	45.15	1.44	42.86	0.89	57	44.74	1.60	50.70	1.41	49.50	1.02
F 55	39.13	1.62	44.71	1.28	42.67	0.94	53	42.40	1.56	49.16	1.32	50.30	1.04
M 60	42.28	1.78	45.74	1.27	44.12	0.88	56	46.68	1.67	51.69	1.26	50.90	0.96
A 59	38.94	1.72	41.88	1.30	38.90	0.82	56	44.32	1.68	*48.83	1.31	46.80	0.94
M 62	39.08	1.64	°41.31	1.33	41.40	0.69	59	41.91	1.73	°46.55	1.39	39.50	0.80
J 59	*34.37	1.43	35.11	1.23	29.10	0.57	55	35.04	1.68	°39.86	1.31	32.70	0.71
J 60	27.54	1.55	30.31	1.45	17.90	0.40	59	29.29	1.89	34.27	1.60	26.00	0.54
A 62	28.48	1.59	30.93	1.41	22.70	0.43	61	28.92	1.70	33.73	1.52	24.60	0.45
S 60	35.31	1.59	37.78	1.36	29.20	0.63	57	36.80	1.56	43.07	1.39	36.70	0.79
O 59	38.06	1.59	40.41	1.29	34.90	0.65	58	41.43	1.47	44.82	1.29	39.90	0.72
N 60	43.48	1.43	*47.20	1.16	41.20	0.77	58	47.19	1.37	52.64	1.23	49.00	0.87
D 62	°41.17	1.52	44.73	1.23	42.85	0.81	60	*47.49	1.35	*53.60	1.18	51.99	0.88
Yearly Totals (Avg)	37.28	1.59	40.44	1.31	35.65	0.71		40.51	1.60	45.74	1.35	41.49	0.81

*New records for the month

°Tied previous record

Moisture changes were made in the LFM Model in March and again in August 1982

¹No. of 12-HR Forecasts made by the LFM - the 1-2 day Forecasters never miss a forecast.

Biases are up from last year by both the LFM and the Basic Weather progs. LFM Biases are way up over last year - see graph.

LFM T_SP at 36-12 hrs. is up from "81" by (+.52) and at 24-12 hrs., the LFM prog T_SP score is down (-.95). Both 36-12 and 24-12 BW T_SP scores are up over last year.

TABLE #2

TSNP Scores 1982

	36-12			24-12			
	LFM	BW	POPS	LFM	BW	POPS	
J	67.38	74.62	80.35	70.96	78.02	81.74	
F	74.42	80.58	83.19	76.20	82.13	85.07	
M	69.06	77.37	81.00	72.39	80.47	82.81	
A	74.75	80.23	84.69	77.67	83.10	85.13	
M	73.81	78.35	82.34	74.56	80.21	83.37	
J	74.37	76.84	82.41	72.23	78.23	82.11	
J	73.09	75.52	82.80	70.45	75.85	84.23	
A	75.64	78.55	85.28	74.75	78.69	85.93	
S	75.21	78.77	78.84	76.35	80.78	84.69	
O	79.73	83.37	87.53	82.31	84.88	88.05	
N	75.86	80.68	82.67	77.99	82.40	84.26	
D	71.42	77.13	81.69	77.66	81.97	84.27	
Yearly Totals (Ave)	73.98	78.50	82.73	75.29	80.56	84.31	TSNP

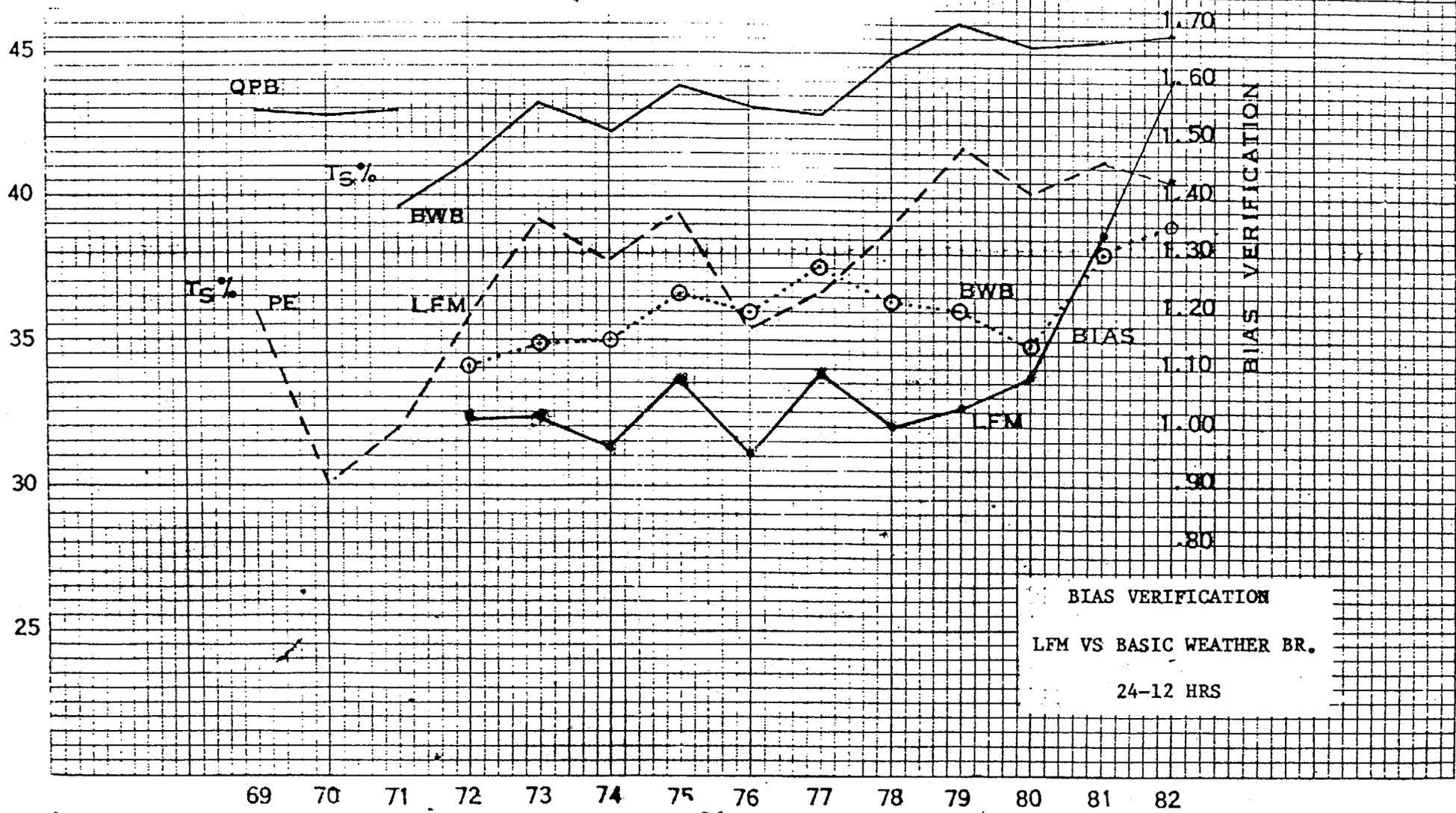
THREAT-SCORE VERIFICATION OF MEASURABLE PRECIPITATION FORECASTS

12 TO 24 HOURS

FORECAST PERIODS 0000 TO 1200 AND 1200 TO 0000 GMT

QPB FORECAST COMPLETED 4 HOURS BEFORE BEGINNING OF FORECAST PERIOD

BWB FORECAST COMPLETED 6 1/2 HOURS BEFORE BEGINNING OF FORECAST PERIOD



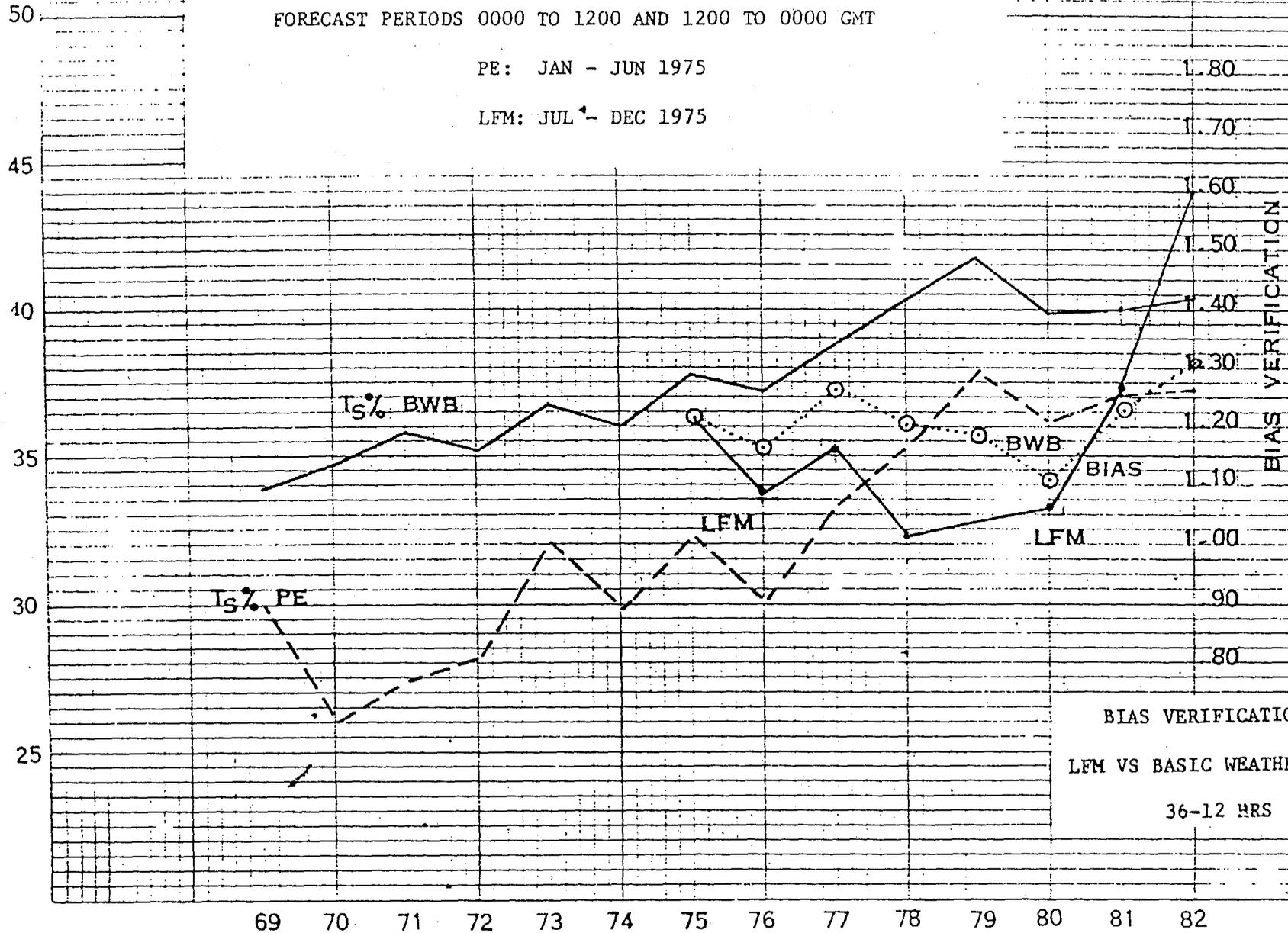
THREAT-SCORE VERIFICATION OF MEASURABLE PRECIPITATION FORECASTS

24 TO 36 HOURS

FORECAST PERIODS 0000 TO 1200 AND 1200 TO 0000 GMT

PE: JAN - JUN 1975

LFM: JUL - DEC 1975



BIAS VERIFICATION
 LFM VS BASIC WEATHER BR.
 36-12 HRS