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AFOS-ERA VERIFICATION OF GUIDANCE AND  
LOCAL AVIATION/PUBLIC WEATHER FORECASTS--NO. 16  
(APRIL 1991 - SEPTEMBER 1991)

Valery J. Dagostaro and J. Paul Dallavalle

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1. INTRODUCTION

This office note continues the series of Techniques Development Laboratory (TDL) office notes which present verification results for TDL's automated guidance and National Weather Service (NWS) local forecasts made at Weather Service Forecast Offices (WSFO's). In order to streamline production of the documents and to encourage their use, the format was changed significantly a number of issues ago. Most text has been eliminated, and descriptive information about the verification data is presented in tabular form. In addition, the format includes a section for special items of interest or changes that occurred during the verification season. For more specific information about the forecasts, observations, and verification procedure for each weather element, see Dagostaro and Dallavalle (1991).

Verification statistics are presented here for the warm season months of April 1991 through September 1991 for maximum/minimum (max/min) temperature, probability of precipitation (PoP), cloud amount, surface wind, ceiling height, and visibility. Specific details about the local and objective forecasts and the verifying observations are summarized in Table 1.1. It's important to consider this information when interpreting the verification scores. For example, the objective max/min temperature forecast system is based on calendar day observations for Alaska, but on daytime/nighttime periods for the conterminous U.S. The definitions of the official local max/min temperature forecasts and verifying observations, in turn, differ from those of the guidance.

For this season, the objective guidance was based on forecast equations developed by use of the Model Output Statistics (MOS) technique (Glahn and Lowry, 1972) and applied to forecast fields from the Limited-area Fine Mesh Model (LFM) (Gerrity, 1977; Newell and Deaven, 1981) and the Nested Grid Model (NGM) (Hoke et al., 1989). Additional information about the objective guidance prediction equations is available from the references listed in Table 1.2. Details regarding the local data collection in the conterminous U.S. and Alaska are described briefly in Dagostaro and Dallavalle (1991). For additional information about the local data collection process, see Ruth and Alex (1987). The central data collection and data processing system is described in Dagostaro (1985).

Verification statistics are provided for the 103 stations in the conterminous U.S. and Alaska listed in Table 1.3. The scores are those recommended in the NWS National Verification Plan (National Weather Service, 1982). Definitions of the categories used for verification are given in Table 1.4. For the aviation weather elements, we verified the local forecasts associated with the FT issuance times of approximately 0900 and 1800 UTC. Objective guidance for the aviation weather elements, as well as all local and guidance forecasts for the public weather elements, were verified for the 0000 and 1200 UTC forecast cycles. Because verification data or forecast projections for Alaska differ from those of the conterminous U.S., data for the six Alaskan stations were verified separately from those of the conterminous U.S.

For most weather elements, verification results are presented for all stations in the conterminous U.S. combined, followed by results for each of the four NWS regions in the conterminous U.S. and for the Alaska Region. Max/min temperature and PoP scores are presented in Tables 2.1 - 2.12 and 3.1 - 3.12, respectively. Tables 4.1 - 4.12 show cloud amount verification scores for the conterminous U.S. stations and the Alaskan stations. For wind speed and direction, objective guidance verification results are presented in Tables 5.1 - 5.12, while the analogous local scores are given in Tables 5.13 - 5.24. Comparative verification results for the 42-h significant wind speed are presented in Tables 5.25 - 5.28. For ceiling height and visibility, objective and local forecast verification scores are shown only for the conterminous U.S. stations combined and for the Alaska Region. Tables 6.1 - 6.4 contain the objective ceiling height forecast results for the conterminous U.S. and the Alaska Region, while Tables 6.5 - 6.8 contain ceiling height scores for the local forecasts. Analogously, Tables 7.1 - 7.8 show guidance and local visibility forecast verification scores for the conterminous U.S. stations and the Alaskan stations.

## 2. SUMMARY (APRIL 1991 - SEPTEMBER 1991)

Three stations, namely, Amarillo, Texas; Hobart, Oklahoma; and McAlester, Oklahoma, were added this season.

In general, care must be used when interpreting verification results for rare events, for example, the lower categories of ceiling height or winds > 22 kt.

## 3. REFERENCES

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Table 1.1. Forecasts and observations in the NWS verification data.

Weather Element	Type of Data	Data Source <sup>1</sup>	Projections From		Forecast Cycle (UTC)	Comments
			Forecast Cycle	Forecast Cycle		
Max temp	LFM MOS	FXX	24, 48		0000	Daytime max temperature forecast for the conterminous U.S.; calendar day max temperature forecast for Alaska.
			36, 60		1200	
	NGM MOS	FWC	24, 48		0000	Daytime max temperature forecast for the conterminous U.S.; no guidance for Alaska.
	Local Fcst	FP	24, 48		0000	Daytime max temperature for all stations. In the conterminous U.S., actual daytime period depends on time zone and differs slightly from the guidance definition of daytime. For Alaska, forecasts are valid for 12-h periods ending at 30 (42) and 54 (66) hours after 0000 (1200) UTC.
			36, 60		1200	
	Obs	SAO				Corresponds closely to the local definition of the max for all stations.
Min temp	LFM MOS	FXX	36, 60		0000	Nighttime min temperature forecast for the conterminous U.S.; calendar day min temperature forecast for Alaska.
			24, 48		1200	
	NGM MOS	FWC	36, 60		0000	Nighttime min temperature forecast for the conterminous U.S.; no guidance for Alaska.
	Local Fcst	FP	36, 60		0000	Nighttime min temperature for all stations. In the conterminous U.S., actual nighttime period depends on time zone and differs slightly from the guidance definition of nighttime. For Alaska, forecasts are valid for 12-h periods ending at 30 (42) and 54 (66) hours after 1200 (0000) UTC.
			24, 48		1200	
	Obs	SAO				Corresponds closely to the local definition of the min for all stations.
PoP	LFM MOS	FXX	24, 36, 48		0000, 1200	For the conterminous U.S., forecasts are for 12-h periods ending at the indicated projections. For Alaska, the 12-h periods actually end at 18, 30, and 42 hours from the forecast cycle.
	NGM MOS	FWC	24, 36, 48		0000, 1200	For the conterminous U.S., forecasts are for 12-h periods ending at the indicated projections. There is no NCM-based PoP guidance for Alaska.
	Local Fcst	FP	24, 36, 48		0000, 1200	Same as the guidance forecasts.
	Obs	SAO				Precipitation amount for 12-h periods that match those of the local forecasts.

Table 1.1. Continued.

Weather Element	Type of Data	Data Source <sup>1</sup>	Projections From Forecast Cycle	Forecast Cycle (UTC)	Comments
Precipitation type <sup>2</sup>	LFM MOS	FXX	18, 30, 42	0000, 1200	Forecasts are valid at specific hours corresponding to the indicated projections. Guidance for the conterminous U.S. is for freezing, frozen, and liquid precipitation (mixed frozen and liquid is considered liquid). For Alaska, guidance is for frozen and unfrozen precipitation (freezing is considered unfrozen) but is not verified.
	Local Fcst	MEF	18, 30, 42	0000, 1200	Forecasts of freezing, frozen, and liquid precipitation (mixed frozen and liquid is considered frozen) for all stations. Forecasts are valid at specific hours corresponding to the indicated projections.
	Obs	SAO			Obs are collected at the verifying time and <u>+ 1</u> hour of the verifying time.
Snow amount <sup>2</sup>	LFM MOS	FXX	24	0000, 1200	For the conterminous U.S., categorical forecasts of snow amount for the 12-h period ending at the indicated projection; no comparable guidance for Alaska.
	Local Fcst	MEF	24	0000, 1200	Snow amount forecast in inches for the 12-h period ending at the indicated projection.
	Obs	SSM			12-h snow amount.
Cloud amount	LFM MOS	FXX	12, 18, 24	0000, 1200	Categorical forecasts of opaque sky cover.
	NGM MOS	FWC	12, 18, 24	0000, 1200	Categorical forecasts of opaque sky cover for the conterminous U.S.; no guidance for Alaska.
	Local Fcst	MEF	12, 18, 24	0000, 1200	Categorical forecasts of sky cover.
	Obs	SAO			Observed total sky cover (includes thin clouds) at the verifying hour.
Wind speed	LFM MOS	FXX	12, 18, 24, 42	0000, 1200	Valid at specific hours after 0000 or 1200 UTC.
	NGM MOS	FWC	12, 18, 24, 42	0000, 1200	For the conterminous U.S., forecasts are valid at the indicated hours after 0000 or 1200 UTC; no guidance for Alaska.
	Local Fcst	FT	3, 9, 15	0900, 1800	Terminal aviation forecasts are valid for variable time periods. Forecasts valid for the "projections" at left are verified. Approximate FT issuance times, at left, depend on time zone where station is located.
	Obs	MEF	42	0000, 1200	A yes/no forecast of $\geq 23$ kt wind speed.
	Obs	SAO			Observed values at the specific hour and $\pm 3$ hours (highest sustained wind) correspond to the valid times of the local terminal aviation forecasts. Obs corresponding to the valid times of the local forecasts are collected at the stations. Verifying obs that correspond to the valid times of the MOS guidance are from hourly obs collected at TDL.

Table 1.1. Continued.

Weather Element	Type of Data	Data Source <sup>1</sup>	Projections From Forecast Cycle	Forecast Cycle (UTC)	Comments
Wind direction	LFM MOS	FXX	12, 18, 24	0000, 1200	Valid at specific hours after 0000 or 1200 UTC.
	NGM MOS	FWC	12, 18, 24	0000, 1200	For the conterminous U.S., forecasts are valid at the indicated hours after 0000 or 1200 UTC; no guidance for Alaska.
	Local Fcst	FT	3, 9, 15	0900, 1800	Same as for local wind speed.
	Obs	SAO			Observed values at the specific hour.
Ceiling height	LFM MOS	FXX	12, 18, 24	0000, 1200	Categorical value. Definitions of categories match the official definitions of LIFR and IFR, but differ slightly from the official definitions of MVFR and VFR.
	Local Fcst	FT	3, 6, 9, 15	0900, 1800	Forecasts are converted to categorical values. See wind speed for FT valid times and issuance times.
	Persis	SAO			Persistence observations used for comparison with the local forecasts are collected at the stations and are the latest hourly obs available at the scheduled FT release time. Since March 1987, persistence obs used for comparison with the MOS guidance are from hourly obs taken at 0900 (2100) UTC for the 0000 (1200) UTC cycle. These latter obs are collected at TDL.
	Obs	SAO			Observations taken at specific hours. Obs corresponding to the valid times of the local forecasts are collected at the stations. Verifying obs that correspond to the valid times of the MOS guidance are from hourly obs collected at TDL.
Visibility	LFM MOS	FXX	12, 18, 24	0000, 1200	See ceiling height.
	Local Fcst	FT	3, 6, 9, 15	0900, 1800	See ceiling height.
	Persis	SAO			See ceiling height.
	Obs	SAO			See ceiling height.

<sup>1</sup>Data sources are as follows:

- FXX - FPC bulletin contains LFM-based MOS guidance for all weather elements for stations in the conterminous U.S.; guidance for Alaska is obtained from the FPAK1 and FPAK2 bulletins
- FWC - FWC bulletin contains NGM-based MOS guidance for max/min temperature, PoP, cloud amount, and surface wind for stations in the conterminous U.S. only; there is no NGM-based guidance for Alaska at this time
- FP - Coded city forecast (FPUS4) bulletin containing official local public weather element forecasts in the conterminous U.S.; data in Alaska are obtained from the FPAK4 bulletin
- FT - Aviation terminal forecast containing official local forecasts for aviation weather elements
- MEF - Manually entered forecast product containing official local forecasts of some weather elements
- SAO - Surface airways observation containing verifying observations corresponding to local and MOS forecasts for most weather elements
- SSM - Surface synoptic report containing verifying observations of snow amount

<sup>2</sup>Precipitation type and snow amount forecasts are not verified for the warm season months of April through September.



Table 1.2. National Weather Service Technical Procedures Bulletins (TPB's) containing information about MOS guidance.

Geographical Area	Subject	Forecast Model	TPB No.
Conterminous U.S.	max/min temperature	LFM	356
		NGM	387
	PoP	LFM	386
		NGM	387
	precipitation type	LFM	319
	snow amount	LFM	318
	cloud amount	LFM	378
		NGM	387
	surface wind	LFM	347
		NGM	387
	ceiling height	LFM	303
	visibility	LFM	303
Alaska	max/min temperature	LFM	329
	PoP	LFM	329
	cloud amount	LFM	329
	surface wind	LFM	329
	ceiling height	LFM	338
	visibility	LFM	338

Table 1.3. Ninety-seven stations in the conterminous U.S. and six stations in Alaska used for comparative verification of MOS guidance and local forecasts of max/min temperature, probability of precipitation, cloud amount, surface wind, ceiling height, and visibility. Please note that LAX and BET were not included in the max/min temperature and PoP verifications, and LBB and ELP were not included in the ceiling height, visibility, and local surface wind verifications. TCC was not available for the MOS ceiling height and visibility verifications for the 0000 UTC cycle and for the local ceiling height, visibility, and surface wind verifications for the FT release time of approximately 0900 UTC.

DCA	Washington, D.C.	ORF	Norfolk, Virginia
PWM	Portland, Maine	CON	Concord, New Hampshire
BOS	Boston, Massachusetts	PVD	Providence, Rhode Island
ALB	Albany, New York	BTV	Burlington, Vermont
BUF	Buffalo, New York	SYR	Syracuse, New York
LGA	New York (LaGuardia), New York	EWK	Newark, New Jersey
RDU	Raleigh-Durham, North Carolina	CLT	Charlotte, North Carolina
CLE	Cleveland, Ohio	CMH	Columbus, Ohio
PHL	Philadelphia, Pennsylvania	AVP	Scranton, Pennsylvania
PIT	Pittsburgh, Pennsylvania	ERI	Erie, Pennsylvania
CAE	Columbia, South Carolina	CHS	Charleston, South Carolina
CRW	Charleston, West Virginia	BKW	Beckley, West Virginia
BHM	Birmingham, Alabama	MOB	Mobile, Alabama
AMA	Amarillo, Texas		
LIT	Little Rock, Arkansas	FSM	Fort Smith, Arkansas
MIA	Miami, Florida	TPA	Tampa, Florida
ATL	Atlanta, Georgia	SAV	Savannah, Georgia
MSY	New Orleans, Louisiana	SHV	Shreveport, Louisiana
JAN	Jackson, Mississippi	MEI	Meridian, Mississippi
ABQ	Albuquerque, New Mexico	TCC	Tucumcari, New Mexico
OKC	Oklahoma City, Oklahoma	HBR	Hobart, Oklahoma
TUL	Tulsa, Oklahoma	MLC	McAlester, Oklahoma
MEM	Memphis, Tennessee	BNA	Nashville, Tennessee
DFW	Dallas-Ft. Worth, Texas	ABI	Abilene, Texas
LBB	Lubbock, Texas	ELP	El Paso, Texas
SAT	San Antonio, Texas	IAH	Houston, Texas
DEN	Denver, Colorado	GJT	Grand Junction, Colorado
ORD	Chicago (O'Hare), Illinois	SPI	Springfield, Illinois
IND	Indianapolis, Indiana	SBN	South Bend, Indiana
DSM	Des Moines, Iowa	ALO	Waterloo, Iowa
TOP	Topeka, Kansas	ICT	Wichita, Kansas
SDF	Louisville, Kentucky	LEX	Lexington, Kentucky
DTW	Detroit, Michigan	GRR	Grand Rapids, Michigan
MSP	Minneapolis, Minnesota	DLH	Duluth, Minnesota
STL	St. Louis, Missouri	MCI	Kansas City, Missouri
OMA	Omaha, Nebraska	LBF	North Platte, Nebraska
BIS	Bismarck, North Dakota	FAR	Fargo, North Dakota
FSD	Sioux Falls, South Dakota	RAP	Rapid City, South Dakota
MKE	Milwaukee, Wisconsin	MSN	Madison, Wisconsin
CYS	Cheyenne, Wyoming	CPR	Casper, Wyoming
PHX	Phoenix, Arizona	TUS	Tucson, Arizona
LAX	Los Angeles, California	SAN	San Diego, California
SFO	San Francisco, California	FAT	Fresno, California
BOI	Boise, Idaho	PIH	Pocatello, Idaho
GTF	Great Falls, Montana	BIL	Billings, Montana
RNO	Reno, Nevada	LAS	Las Vegas, Nevada
PDX	Portland, Oregon	MFR	Medford, Oregon
SLC	Salt Lake City, Utah	CDC	Cedar City, Utah
SEA	Seattle-Tacoma, Washington	GEG	Spokane, Washington
ANC	Anchorage, Alaska	BET	Bethel, Alaska
FAI	Fairbanks, Alaska	OME	Nome, Alaska
JNU	Juneau, Alaska	YAK	Yakutat, Alaska

Table 1.4. Definitions of categories used for verification.

Category	Precipitation Type	Snow Amount* (in)	Cloud Amount	Wind Speed (kt)	Wind Direction (degrees)	Ceiling Height (ft)	Visibility (mi)
1	ZL, ZR, any combination of precipitation types that includes ZL or ZR	<2	CLR, -SCT, -BKN, -OVC, -X	≤12	340-20	≤400	<1
2	IC, IP, IPW, S, SG, SP, SW, and combination of frozen and liquid	2-3	SCT	13-17	30-60	500-900	1-2 3/4
3	L, R, RW	4-5	BKN	18-22	70-110	1000-2900	3-6
4		≥6	OVC, X	23-27	120-150	≥3000	>6
5				28-32	160-200		
6				≥33	210-240		
7					250-290		
8					300-330		

\*Scores based on cumulative snow amount categories of ≥ 2, ≥ 4, and ≥ 6 inches are noted in the verification tables.

Table 2.1. Comparative verification of local, LFM MOS, and NCM MOS max/min temperature forecasts for 96 stations in the conterminous U.S., 0000 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Today's Max	LOCAL		0.0	2.6	1.2	--	--	80.8
	LFM MOS	16084	-0.5	2.9	1.7	--	--	76.3
	NGM MOS		-0.5	3.0	1.7	--	--	75.3
Tonight's Min	LOCAL		-0.3	2.6	0.5	0.43	0.49	78.8
	LFM MOS	16042	-0.4	2.8	0.6	0.51	0.38	76.2
	NGM MOS		-1.1	2.9	0.9	0.66	0.66	73.6
Tomorrow's Max	LOCAL		0.0	3.3	3.1	--	--	69.1
	LFM MOS	16051	-0.4	3.7	3.8	--	--	63.9
	NGM MOS		-0.4	3.7	4.2	--	--	62.4
Tomorrow Night's Min	LOCAL		-0.6	3.1	1.6	0.33	0.50	69.3
	LFM MOS	15994	-0.5	3.3	2.0	0.22	0.50	66.7
	NGM MOS		-1.2	3.4	2.2	0.57	0.64	65.3

Table 2.2. Same as Table 2.1 except for the 1200 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Tonight's Min	LOCAL		-0.5	2.4	0.4	0.50	0.47	81.5
	LFM MOS	16077	-0.4	2.6	0.5	0.46	0.46	79.1
	NGM MOS		-0.8	2.7	0.7	0.63	0.59	76.7
Tomorrow's Max	LOCAL		0.0	3.0	2.2	--	--	74.4
	LFM MOS	16035	-0.2	3.4	3.1	--	--	68.0
	NGM MOS		0.3	3.5	3.4	--	--	66.9
Tomorrow Night's Min	LOCAL		-0.5	2.9	1.1	0.34	0.60	74.2
	LFM MOS	15987	-0.6	3.0	1.2	0.32	0.48	71.4
	NGM MOS		-0.7	3.1	1.2	0.60	0.60	70.6
Day After Tomorrow's Max	LOCAL		0.0	3.7	4.6	--	--	61.3
	LFM MOS	15994	-0.4	4.1	5.6	--	--	55.6
	NGM MOS		-0.1	4.0	5.6	--	--	56.2

Table 2.3. Comparative verification of local, LFM MOS, and NCM MOS max/min temperature forecasts for 24 stations in the Eastern Region, 0000 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Today's Max	LOCAL		-0.3	2.6	1.2	--	--	83.2
	LFM MOS	4018	-0.9	3.2	1.8	--	--	77.9
	NGM MOS		-1.1	3.1	1.3	--	--	78.8
Tonight's Min	LOCAL		-0.4	2.6	0.5	0.43	0.63	82.7
	LFM MOS	3993	-0.4	2.7	0.4	0.57	0.64	81.8
	NGM MOS		-1.2	3.0	0.8	0.71	0.76	78.2
Tomorrow's Max	LOCAL		-0.7	3.4	3.0	--	--	73.2
	LFM MOS	4001	-1.3	3.8	4.2	--	--	66.8
	NGM MOS		-1.1	3.7	3.6	--	--	69.7
Tomorrow Night's Min	LOCAL		-0.9	3.2	1.5	0.43	0.57	73.9
	LFM MOS	3987	-1.0	3.3	1.8	0.43	0.50	72.3
	NGM MOS		-1.0	3.4	1.8	0.71	0.62	72.0

Table 2.4. Same as Table 2.3 except for the 1200 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Tonight's Min	LOCAL		-0.7	2.4	0.3	0.80	0.64	84.4
	LFM MOS	4007	-0.5	2.6	0.3	0.80	0.64	83.2
	NGM MOS		-1.0	2.8	0.4	0.80	0.76	80.7
Tomorrow's Max	LOCAL		-0.6	3.1	2.2	--	--	77.3
	LFM MOS	3997	-1.0	3.6	3.3	--	--	70.8
	NGM MOS		-0.3	3.2	2.8	--	--	75.4
Tomorrow Night's Min	LOCAL		-0.8	2.9	0.9	0.29	0.75	78.2
	LFM MOS	3981	-1.0	3.1	0.9	0.57	0.60	76.8
	NGM MOS		-0.5	3.1	0.8	0.43	0.70	77.0
Day After Tomorrow's Max	LOCAL		-0.8	3.8	4.6	--	--	67.2
	LFM MOS	3990	-1.6	4.3	5.6	--	--	59.9
	NGM MOS		-0.8	3.9	4.9	--	--	66.2

Table 2.5. Comparative verification of local, LFM MOS, and NGM MOS max/min temperature forecasts for 27 stations in the Southern Region, 0000 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Today's Max	LOCAL		0.3	2.2	0.9	--	--	68.5
	LFM MOS	4409	0.0	2.5	1.1	--	--	63.6
	NGM MOS		-0.4	2.6	1.0	--	--	61.2
Tonight's Min	LOCAL		-0.1	2.2	0.3	*	*	74.3
	LFM MOS	4404	0.2	2.4	0.4	*	*	71.7
	NGM MOS		-1.3	2.6	0.6	*	*	66.2
Tomorrow's Max	LOCAL		0.4	2.8	1.9	--	--	52.3
	LFM MOS	4401	0.4	3.0	2.0	--	--	48.0
	NGM MOS		-0.6	3.3	2.7	--	--	37.3
Tomorrow Night's Min	LOCAL		-0.2	2.6	1.1	*	*	63.6
	LFM MOS	4385	0.1	2.6	0.9	*	*	63.8
	NGM MOS		-1.5	2.9	1.0	*	*	57.5

Table 2.6. Same as Table 2.5 except for the 1200 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Tonight's Min	LOCAL		-0.2	2.0	0.2	*	*	78.6
	LFM MOS	4389	0.1	2.2	0.2	*	*	75.9
	NGM MOS		-0.9	2.5	0.5	*	*	68.9
Tomorrow's Max	LOCAL		0.4	2.5	1.3	--	--	60.0
	LFM MOS	4381	0.4	2.8	1.9	--	--	52.3
	NGM MOS		0.2	3.0	2.0	--	--	46.0
Tomorrow Night's Min	LOCAL		-0.1	2.4	0.6	*	*	70.7
	LFM MOS	4368	0.0	2.5	0.6	*	*	68.2
	NGM MOS		-1.1	2.8	0.9	**	1.00	61.0
Day After Tomorrow's Max	LOCAL		0.5	3.1	2.9	--	--	41.9
	LFM MOS	4358	0.4	3.2	3.1	--	--	38.1
	NGM MOS		-0.3	3.4	3.5	--	--	30.1

\* Events of  $\leq 32^\circ\text{F}$  were neither forecast nor observed.

\*\* Events of  $\leq 32^\circ\text{F}$  were forecast but not observed.

Table 2.7. Comparative verification of local, LFM MOS, and NCM MOS max/min temperature forecasts for 28 stations in the Central Region, 0000 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Today's Max	LOCAL		-0.1	2.9	1.5	--	--	82.8
	LFM MOS	4771	-0.8	3.2	2.0	--	--	79.3
	NGM MOS		-0.6	3.4	2.5	--	--	76.8
Tonight's Min	LOCAL		-0.5	2.9	0.5	0.48	0.50	81.9
	LFM MOS	4764	-0.7	3.1	0.8	0.61	0.30	79.4
	NGM MOS		-1.3	3.3	1.1	0.65	0.69	77.1
Tomorrow's Max	LOCAL		-0.3	3.7	4.3	--	--	71.6
	LFM MOS	4765	-1.0	4.0	4.7	--	--	68.5
	NGM MOS		-0.5	4.2	6.3	--	--	64.5
Tomorrow Night's Min	LOCAL		-0.9	3.5	2.0	0.29	0.56	72.9
	LFM MOS	4749	-0.9	3.7	2.7	0.17	0.64	70.1
	NGM MOS		-1.6	3.9	3.6	0.63	0.69	67.4

Table 2.8. Same as Table 2.7 except for the 1200 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Tonight's Min	LOCAL		-0.6	2.7	0.4	0.52	0.50	84.3
	LFM MOS	4779	-0.6	2.9	0.6	0.39	0.53	81.8
	NGM MOS		-0.7	3.0	0.9	0.65	0.58	80.9
Tomorrow's Max	LOCAL		-0.1	3.4	2.9	--	--	76.7
	LFM MOS	4769	-0.5	3.8	4.0	--	--	71.9
	NGM MOS		0.4	4.0	5.1	--	--	68.1
Tomorrow Night's Min	LOCAL		-0.7	3.2	1.6	0.33	0.64	77.2
	LFM MOS	4755	-0.9	3.4	1.8	0.33	0.47	74.5
	NGM MOS		-0.9	3.5	1.9	0.67	0.59	74.2
Day After Tomorrow's Max	LOCAL		-0.2	4.2	6.0	--	--	64.1
	LFM MOS	4763	-0.9	4.4	6.9	--	--	61.1
	NGM MOS		0.1	4.6	8.3	--	--	57.2

Table 2.9. Comparative verification of local, LFM MOS, and NGM MOS max/min temperature forecasts for 17 stations in the Western Region, 0000 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Today's Max	LOCAL		0.3	2.5	1.2	--	--	80.0
	LFM MOS	2886	0.0	2.9	1.8	--	--	74.7
	NGM MOS		0.1	2.8	1.8	--	--	74.7
Tonight's Min	LOCAL		-0.4	2.7	0.9	0.35	0.33	62.0
	LFM MOS	2881	-0.5	3.0	0.9	0.35	0.25	54.0
	NGM MOS		-0.5	2.8	1.2	0.65	0.48	57.8
Tomorrow's Max	LOCAL		0.6	3.2	3.0	--	--	67.0
	LFM MOS	2884	0.5	3.8	4.5	--	--	57.8
	NGM MOS		0.8	3.6	3.7	--	--	61.7
Tomorrow Night's Min	LOCAL		-0.4	3.0	2.0	0.33	0.29	49.8
	LFM MOS	2873	-0.2	3.4	2.5	0.20	0.00	40.4
	NGM MOS		-0.1	3.1	2.3	0.40	0.45	48.4

Table 2.10. Same as Table 2.9 except for the 1200 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Tonight's Min	LOCAL		-0.5	2.5	0.6	0.39	0.13	66.5
	LFM MOS	2902	-0.8	2.7	0.8	0.44	0.11	61.5
	NGM MOS		-0.6	2.7	0.8	0.56	0.41	61.4
Tomorrow's Max	LOCAL		0.3	2.9	2.3	--	--	73.5
	LFM MOS	2888	0.3	3.5	3.2	--	--	64.3
	NGM MOS		1.0	3.5	3.4	--	--	62.8
Tomorrow Night's Min	LOCAL		-0.5	2.9	1.5	0.38	0.40	55.5
	LFM MOS	2883	-0.5	3.2	1.7	0.19	0.25	48.2
	NGM MOS		-0.2	3.0	1.3	0.56	0.55	52.7
Day After Tomorrow's Max	LOCAL		0.7	3.7	5.0	--	--	56.8
	LFM MOS	2883	1.0	4.4	7.0	--	--	45.8
	NGM MOS		1.0	4.0	5.3	--	--	53.5



Table 2.11. Comparative verification of local and LFM MOS max/min temperature forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Today's Max	LOCAL	836	0.8	3.1	1.6	--	--	*
	LFM MOS		1.1	3.1	1.2	--	--	*
Tonight's Min	LOCAL	836	-0.3	3.1	1.2	0.00	1.00	*
	LFM MOS		-0.8	3.1	1.1	0.00	1.00	*
Tomorrow's Max	LOCAL	836	0.5	3.6	3.3	--	--	*
	LFM MOS		0.9	3.6	3.2	--	--	*
Tomorrow Night's Min	LOCAL	836	-0.6	3.5	2.5	0.00	1.00	*
	LFM MOS		-0.8	3.4	2.4	0.00	1.00	*

Table 2.12. Same as Table 2.11 except for the 1200 UTC cycle.

Forecast Projection	Forecast Type	Number of Cases	Mean Algebraic Error (°F)	Mean Absolute Error (°F)	Percent of Absolute Errors >10°F	Probability of Detection (32°F)	False Alarm Ratio (32°F)	Improvement Over Climate
Tonight's Min	LOCAL	834	-0.7	2.8	1.0	0.00	1.00	*
	LFM MOS		-1.2	3.2	0.7	0.00	1.00	*
Tomorrow's Max	LOCAL	834	0.2	3.3	3.1	--	--	*
	LFM MOS		0.5	3.4	1.9	--	--	*
Tomorrow Night's Min	LOCAL	834	-0.8	3.4	2.0	0.00	1.00	*
	LFM MOS		-1.1	3.3	1.6	0.20	0.67	*
Day After Tomorrow's Max	LOCAL	834	0.4	3.8	3.5	--	--	*
	LFM MOS		0.6	3.8	3.4	--	--	*

\* Percent improvement over climate scores were not available.

Table 3.1. Comparative verification of local, LFM MOS, and NGM MOS PoP forecasts for 96 stations in the conterminous U.S., 0000 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.1074		32.5	16062			
	LFM MOS	0.1131	5.0	28.9		0.2285	15.3	2107
	NGM MOS	0.1111	3.3	30.2		0.2079	7.9	2772
24-36 (2nd period)	LOCAL	0.1115		24.6	16067			
	LFM MOS	0.1140	2.2	22.9		0.2227	7.5	1740
	NGM MOS	0.1126	1.0	23.8		0.2065	1.8	2529
36-48 (3rd period)	LOCAL	0.1266		20.4	16041			
	LFM MOS	0.1281	1.1	19.5		0.2034	2.6	1830
	NGM MOS	0.1268	0.2	20.3		0.2023	-1.0	2470

Table 3.2. Same as Table 3.1 except for the 1200 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.1030		30.4	16103			
	LFM MOS	0.1068	3.6	27.8		0.2169	9.1	2191
	NGM MOS	0.1052	2.1	28.9		0.2001	4.9	2866
24-36 (2nd period)	LOCAL	0.1184		25.5	16070			
	LFM MOS	0.1224	3.2	23.0		0.2226	11.6	1872
	NGM MOS	0.1189	0.4	25.2		0.2067	-0.2	2574
36-48 (3rd period)	LOCAL	0.1199		19.1	16018			
	LFM MOS	0.1207	0.7	18.5		0.2129	1.1	1728
	NGM MOS	0.1194	-0.4	19.4		0.2029	-1.4	2337

Table 3.3. Comparative verification of local, LFM MOS, and NGM MOS PoP forecasts for 24 stations in the Eastern Region, 0000 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.1023		40.6	4008			
	LFM MOS	0.1075	4.9	37.6		0.2126	11.5	632
	NGM MOS	0.1060	3.5	38.5		0.1939	8.2	720
24-36 (2nd period)	LOCAL	0.1120		30.8	4000			
	LFM MOS	0.1141	1.9	29.4		0.2171	5.3	465
	NGM MOS	0.1118	-0.2	30.9		0.2007	-1.3	606
36-48 (3rd period)	LOCAL	0.1250		28.0	3994			
	LFM MOS	0.1250	0.0	28.0		0.1801	-1.1	539
	NGM MOS	0.1254	0.4	27.8		0.1911	-0.6	642

Table 3.4. Same as Table 3.3 except for the 1200 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.1035		36.6	4019			
	LFM MOS	0.1054	1.7	35.5		0.2037	5.1	547
	NGM MOS	0.1032	-0.4	36.8		0.1804	-0.7	691
24-36 (2nd period)	LOCAL	0.1154		33.8	4004			
	LFM MOS	0.1228	6.0	29.6		0.2331	17.3	591
	NGM MOS	0.1147	-0.5	34.2		0.1863	-1.5	667
36-48 (3rd period)	LOCAL	0.1192		26.1	3996			
	LFM MOS	0.1220	2.3	24.4		0.2036	6.0	498
	NGM MOS	0.1182	-0.8	26.7		0.1975	-3.2	659

Table 3.5. Comparative verification of local, LFM MOS, and NGM MOS PoP forecasts for 27 stations in the Southern Region, 0000 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.1384		27.1				
	LFM MOS	0.1438	3.7	24.2	4402	0.2297	13.6	670
	NGM MOS	0.1419	2.5	25.2		0.2127	4.6	897
24-36 (2nd period)	LOCAL	0.1264		17.4				
	LFM MOS	0.1274	0.8	16.7	4410	0.2218	3.1	571
	NGM MOS	0.1262	-0.1	17.5		0.2001	-2.0	706
36-48 (3rd period)	LOCAL	0.1569		17.0				
	LFM MOS	0.1598	1.8	15.5	4398	0.2286	5.8	589
	NGM MOS	0.1574	0.3	16.7		0.2071	-1.1	710

Table 3.6. Same as Table 3.5 except for the 1200 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.1174		22.6				
	LFM MOS	0.1216	3.5	19.8	4396	0.2201	9.5	722
	NGM MOS	0.1202	2.3	20.7		0.2171	6.3	857
24-36 (2nd period)	LOCAL	0.1477		21.7				
	LFM MOS	0.1517	2.6	19.6	4388	0.2196	11.4	620
	NGM MOS	0.1508	2.0	20.1		0.2203	4.6	792
36-48 (3rd period)	LOCAL	0.1346		12.1				
	LFM MOS	0.1324	-1.7	13.6	4375	0.2199	-6.5	500
	NGM MOS	0.1337	-0.7	12.7		0.2041	-3.7	566

Table 3.7. Comparative verification of local, LFM MOS, and NGM MOS PoP forecasts for 28 stations in the Central Region, 0000 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.1086		31.8	4765			
	LFM MOS	0.1152	5.7	27.7		0.2344	18.7	609
	NGM MOS	0.1114	2.6	30.0		0.2073	8.0	828
24-36 (2nd period)	LOCAL	0.1211		25.6	4769			
	LFM MOS	0.1243	2.6	23.7		0.2237	11.0	543
	NGM MOS	0.1223	1.0	24.9		0.2130	2.1	909
36-48 (3rd period)	LOCAL	0.1312		17.6	4761			
	LFM MOS	0.1314	0.1	17.5		0.1899	-1.6	524
	NGM MOS	0.1295	-1.4	18.7		0.2023	-4.0	865

Table 3.8. Same as Table 3.7 except for the 1200 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.1106		32.2	4783			
	LFM MOS	0.1162	4.8	28.8		0.2266	12.3	688
	NGM MOS	0.1131	2.2	30.7		0.2002	4.1	956
24-36 (2nd period)	LOCAL	0.1226		23.0	4775			
	LFM MOS	0.1247	1.6	21.7		0.2117	3.9	472
	NGM MOS	0.1208	-1.5	24.1		0.2075	-5.6	803
36-48 (3rd period)	LOCAL	0.1317		19.3	4761			
	LFM MOS	0.1328	0.9	18.6		0.2083	1.2	576
	NGM MOS	0.1325	0.6	18.8		0.2147	2.7	830

Table 3.9. Comparative verification of local, LFM MOS, and NGM MOS PoP forecasts for 17 stations in the Western Region, 0000 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.0655		32.8	2887			
	LFM MOS	0.0706	7.2	27.6		0.2571	20.9	196
	NGM MOS	0.0707	7.4	27.5		0.2269	15.9	327
24-36 (2nd period)	LOCAL	0.0723		25.2	2888			
	LFM MOS	0.0762	5.2	21.1		0.2390	16.7	161
	NGM MOS	0.0769	5.9	20.5		0.2132	14.9	308
36-48 (3rd period)	LOCAL	0.0754		21.8	2888			
	LFM MOS	0.0789	4.4	18.3		0.2308	11.4	178
	NGM MOS	0.0780	3.2	19.2		0.2170	8.0	253

Table 3.10. Same as Table 3.9 except for the 1200 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
12-24 (1st period)	LOCAL	0.0678		30.2	2905			
	LFM MOS	0.0710	4.5	26.9		0.2089	6.8	234
	NGM MOS	0.0724	6.3	25.5		0.1971	13.5	362
24-36 (2nd period)	LOCAL	0.0715		24.9	2903			
	LFM MOS	0.0737	3.0	22.6		0.2269	12.1	189
	NGM MOS	0.0733	2.4	23.1		0.2133	3.1	312
36-48 (3rd period)	LOCAL	0.0790		19.2	2886			
	LFM MOS	0.0810	2.4	17.2		0.2372	9.9	154
	NGM MOS	0.0778	-1.5	20.4		0.1782	-6.1	282

Table 3.11. Comparative verification of local and LFM MOS PoP forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
6-18 (1st period)	LOCAL LFM MOS	0.1342 0.1461	8.1	*	655	0.2085	12.7	206
18-30 (2nd period)	LOCAL LFM MOS	0.1584 0.1722	8.0	*	641	0.2499	17.8	190
30-42 (3rd period)	LOCAL LFM MOS	0.1565 0.1508	-3.8	*	656	0.2009	-1.9	180

Table 3.12. Same as Table 3.11 except for the 1200 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	Local % Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance		
						Guid. Brier Score	Local % Imprv.	No. of Changes
6-18 (1st period)	LOCAL LFM MOS	0.1438 0.1602	10.3	*	642	0.2406	20.8	187
18-30 (2nd period)	LOCAL LFM MOS	0.1378 0.1422	3.1	*	654	0.2194	9.2	184
30-42 (3rd period)	LOCAL LFM MOS	0.1660 0.1692	1.9	*	643	0.2362	5.2	166

\* Percent improvement over climate scores were not available.

Table 4.1. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 97 stations in the conterminous U.S., 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.74	1.37	1.50	0.83	58.8	0.447
	LFM MOS	0.74	1.67	1.27	0.74	50.0	0.329
	NGM MOS	0.79	1.59	1.35	0.70	50.7	0.338
	No. Obs.	5858	3219	2286	4862		
18	LOCAL	0.56	1.35	1.54	0.57	49.4	0.322
	LFM MOS	0.71	1.41	1.18	0.67	51.9	0.352
	NGM MOS	0.64	1.51	1.29	0.52	50.6	0.335
	No. Obs.	4230	4750	3419	3970		
24	LOCAL	0.60	1.33	1.70	0.57	43.5	0.251
	LFM MOS	0.73	1.39	1.30	0.65	47.7	0.301
	NGM MOS	0.65	1.54	1.38	0.52	46.5	0.285
	No. Obs.	4618	4469	3051	4085		

Table 4.2. Same as Table 4.1 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.74	1.21	1.50	0.69	53.7	0.384
	LFM MOS	0.84	1.45	1.11	0.61	50.0	0.328
	NGM MOS	0.75	1.47	1.28	0.56	49.0	0.318
	No. Obs.	4612	4464	3028	4083		
18	LOCAL	0.63	1.77	2.08	0.65	46.9	0.289
	LFM MOS	0.92	1.70	1.01	0.69	53.0	0.332
	NGM MOS	0.86	1.85	1.15	0.62	51.5	0.318
	No. Obs.	7321	2727	1912	4224		
24	LOCAL	0.70	1.58	1.69	0.65	45.1	0.273
	LFM MOS	0.81	1.65	1.18	0.72	49.2	0.315
	NGM MOS	0.73	1.81	1.34	0.63	47.6	0.302
	No. Obs.	5831	3229	2279	4838		



Table 4.3. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 24 stations in the Eastern Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.64	1.55	1.80	0.77	52.5	0.367
	LFM MOS	0.72	1.67	1.36	0.79	49.2	0.315
	NGM MOS	0.77	1.70	1.40	0.71	49.2	0.318
	No. Obs.	1381	736	512	1398		
18	LOCAL	0.40	1.21	1.71	0.61	48.9	0.303
	LFM MOS	0.50	1.28	1.29	0.78	52.8	0.352
	NGM MOS	0.41	1.41	1.37	0.62	51.4	0.331
	No. Obs.	765	1324	855	1077		
24	LOCAL	0.54	1.45	1.99	0.61	42.3	0.245
	LFM MOS	0.65	1.49	1.47	0.73	46.6	0.292
	NGM MOS	0.62	1.78	1.43	0.55	45.3	0.278
	No. Obs.	1235	958	620	1217		

Table 4.4. Same as Table 4.3 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.64	1.33	1.81	0.70	48.2	0.318
	LFM MOS	0.76	1.59	1.25	0.66	49.4	0.325
	NGM MOS	0.71	1.74	1.28	0.58	48.2	0.312
	No. Obs.	1234	952	610	1223		
18	LOCAL	0.65	1.98	2.20	0.65	48.0	0.305
	LFM MOS	0.87	2.03	1.12	0.71	53.0	0.342
	NGM MOS	0.92	1.78	1.34	0.68	54.6	0.362
	No. Obs.	1709	534	441	1333		
24	LOCAL	0.66	1.66	1.95	0.65	44.1	0.262
	LFM MOS	0.71	1.73	1.44	0.74	47.1	0.290
	NGM MOS	0.68	1.78	1.61	0.68	46.7	0.291
	No. Obs.	1373	737	502	1401		

Table 4.5. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 27 stations in the Southern Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.63	1.38	1.43	0.85	55.9	0.416
	LFM MOS	0.66	1.70	1.16	0.73	48.1	0.311
	NGM MOS	0.74	1.50	1.27	0.73	49.5	0.329
	No. Obs.	1399	1010	756	1277		
18	LOCAL	0.53	1.34	1.24	0.55	50.0	0.303
	LFM MOS	0.77	1.37	0.99	0.65	53.7	0.360
	NGM MOS	0.82	1.40	1.06	0.47	53.2	0.350
	No. Obs.	808	1466	1348	987		
24	LOCAL	0.51	1.30	1.48	0.55	42.0	0.209
	LFM MOS	0.66	1.38	1.09	0.71	47.6	0.285
	NGM MOS	0.61	1.45	1.28	0.47	46.5	0.268
	No. Obs.	921	1398	1055	1069		

Table 4.6. Same as Table 4.5 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.65	1.21	1.39	0.63	54.9	0.387
	LFM MOS	0.83	1.45	0.84	0.71	49.8	0.313
	NGM MOS	0.67	1.40	1.13	0.62	49.6	0.311
	No. Obs.	919	1400	1055	1039		
18	LOCAL	0.50	1.88	2.05	0.58	41.3	0.232
	LFM MOS	0.92	1.73	0.76	0.69	50.6	0.304
	NGM MOS	0.83	2.03	0.87	0.55	46.7	0.263
	No. Obs.	1908	851	613	1041		
24	LOCAL	0.57	1.60	1.63	0.61	40.9	0.224
	LFM MOS	0.71	1.77	0.91	0.75	47.4	0.297
	NGM MOS	0.60	1.83	1.22	0.64	45.0	0.274
	No. Obs.	1377	1012	764	1263		

Table 4.7. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 28 stations in the Central Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.72	1.40	1.50	0.82	58.1	0.439
	LFM MOS	0.68	1.71	1.35	0.74	46.9	0.292
	NGM MOS	0.71	1.67	1.49	0.66	48.2	0.311
	No. Obs.	1680	961	660	1425		
18	LOCAL	0.43	1.45	1.82	0.53	45.4	0.275
	LFM MOS	0.60	1.48	1.35	0.65	47.6	0.298
	NGM MOS	0.54	1.58	1.55	0.47	47.0	0.292
	No. Obs.	1242	1347	853	1278		
24	LOCAL	0.50	1.30	1.78	0.60	42.0	0.230
	LFM MOS	0.70	1.34	1.40	0.65	46.1	0.280
	NGM MOS	0.63	1.42	1.52	0.54	45.9	0.278
	No. Obs.	1266	1350	894	1217		

Table 4.8. Same as Table 4.7 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.66	1.17	1.56	0.76	53.1	0.376
	LFM MOS	0.85	1.41	1.22	0.55	47.8	0.299
	NGM MOS	0.78	1.38	1.45	0.48	46.7	0.287
	No. Obs.	1272	1367	888	1239		
18	LOCAL	0.60	1.72	2.26	0.68	45.5	0.274
	LFM MOS	0.91	1.63	1.11	0.70	52.3	0.323
	NGM MOS	0.84	1.74	1.43	0.61	50.7	0.313
	No. Obs.	2141	829	529	1266		
24	LOCAL	0.69	1.59	1.71	0.64	43.6	0.254
	LFM MOS	0.78	1.62	1.34	0.68	47.1	0.291
	NGM MOS	0.71	1.82	1.44	0.58	46.5	0.290
	No. Obs.	1684	972	663	1444		

Table 4.9. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 18 stations in the Western Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.97	1.04	1.24	0.92	72.3	0.598
	LFM MOS	0.92	1.55	1.21	0.67	58.5	0.407
	NGM MOS	0.93	1.46	1.19	0.73	58.2	0.400
	No. Obs.	1398	512	358	762		
18	LOCAL	0.79	1.47	1.66	0.64	55.2	0.374
	LFM MOS	0.87	1.60	1.24	0.56	54.3	0.347
	NGM MOS	0.75	1.86	1.38	0.51	51.0	0.317
	No. Obs.	1415	613	363	628		
24	LOCAL	0.84	1.28	1.65	0.43	49.6	0.309
	LFM MOS	0.90	1.40	1.34	0.40	51.9	0.333
	NGM MOS	0.74	1.61	1.28	0.50	48.8	0.299
	No. Obs.	1196	763	482	582		

Table 4.10. Same as Table 4.9 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	1.00	1.10	1.25	0.66	60.1	0.443
	LFM MOS	0.92	1.33	1.33	0.47	54.5	0.368
	NGM MOS	0.82	1.43	1.28	0.59	53.1	0.356
	No. Obs.	1187	745	475	582		
18	LOCAL	0.83	1.44	1.66	0.70	56.1	0.359
	LFM MOS	0.97	1.42	1.15	0.62	57.7	0.355
	NGM MOS	0.89	1.78	0.97	0.63	55.4	0.333
	No. Obs.	1563	513	329	584		
24	LOCAL	0.87	1.38	1.42	0.78	55.2	0.363
	LFM MOS	1.03	1.34	1.06	0.67	58.0	0.382
	NGM MOS	0.92	1.76	1.04	0.61	54.5	0.347
	No. Obs.	1397	508	350	730		

Table 4.11. Comparative verification of local and LFM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 6 stations in the Alaska Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.73	1.10	1.40	0.96	59.9	0.397
	LFM MOS	0.81	1.37	0.79	1.03	57.0	0.339
	No. Obs.	197	145	154	530		
18	LOCAL	0.59	1.28	1.85	0.84	54.9	0.323
	LFM MOS	0.78	1.18	1.32	0.94	55.7	0.310
	No. Obs.	175	133	148	561		
24	LOCAL	0.53	1.01	1.66	0.88	46.9	0.236
	LFM MOS	0.76	0.94	1.05	1.08	50.7	0.265
	No. Obs.	161	175	203	483		

Table 4.12. Same as Table 4.11 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	LOCAL	0.70	0.90	1.34	0.99	58.0	0.379
	LFM MOS	0.86	0.98	1.12	1.00	57.7	0.372
	No. Obs.	160	170	203	499		
18	LOCAL	0.46	0.99	1.54	1.02	54.9	0.332
	LFM MOS	0.78	1.27	1.08	0.97	54.2	0.328
	No. Obs.	191	161	179	501		
24	LOCAL	0.39	1.02	1.78	0.98	52.0	0.266
	LFM MOS	0.86	1.16	0.96	1.02	56.1	0.319
	No. Obs.	191	143	157	546		

Table 5.1. Comparative verification of NCM and LFM MOS surface wind forecasts for 97 stations in the conterminous U.S., 0000 UTC cycle.

Fcst Proj (h)	Type of Fcst.	Direction				Speed															
		Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Percent Fcst. Correct	Skill Score	Threat Score (>27 kt)	Contingency Table										
											Bias by Category										
										1		2		3		4		5		6	
										No. Obs		No. Obs		No. Obs		No. Obs		No. Obs		No. Obs	
12	LFM	21	0.559	1597	3.2	1.4	1607	93.6	0.350	0.00	1.01	0.87	0.86	0.73	0.00	0.00					
	NGM	21	0.555		3.5	2.2		92.4	0.346	0.11	0.99	1.18	1.61	1.47	2.50	0.50	14869	747	103	15	2
18	LFM	26	0.460	4335	3.1	0.4	4344	82.0	0.365	0.04	1.06	0.75	0.70	0.61	0.19	0.17					
	NGM	25	0.490		3.3	1.5		79.8	0.382	0.08	0.99	1.01	1.28	1.30	1.00	0.50	12850	2405	481	80	16
24	LFM	29	0.445	3755	3.4	0.8	3774	82.4	0.317	0.06	1.05	0.78	0.66	0.50	0.30	0.00					
	NGM	29	0.437		3.8	2.1		80.1	0.348	0.08	0.98	1.07	1.23	1.49	0.70	2.50	13045	2014	507	86	23

Table 5.2. Same as Table 5.1 except for 96 stations for the 1200 UTC cycle.

Fcst Proj (h)	Type of Fcst.	Direction				Speed															
		Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Percent Fcst. Correct	Skill Score	Threat Score (>27 kt)	Contingency Table										
											Bias by Category										
										1		2		3		4		5		6	
										No. Obs		No. Obs		No. Obs		No. Obs		No. Obs		No. Obs	
12	LFM	26	0.477	3747	3.2	0.7	3763	82.6	0.333	0.03	1.05	0.79	0.66	0.59	0.25	0.00					
	NGM	25	0.489		3.6	1.8		80.8	0.364	0.11	0.98	1.05	1.19	1.68	0.63	1.50	12880	2009	489	82	24
18	LFM	25	0.483	1631	3.4	1.2	1643	91.9	0.298	0.00	1.02	0.80	0.47	0.30	0.00	0.00					
	NGM	25	0.490		4.0	2.2		89.9	0.286	0.00	0.99	1.18	1.08	1.17	4.00	0.50	14521	893	168	23	1
24	LFM	24	0.492	1274	3.4	1.3	1283	93.6	0.316	0.00	1.02	0.73	0.80	0.50	0.00	0.00					
	NGM	24	0.503		3.6	1.9		92.5	0.329	0.17	0.99	1.07	1.26	1.14	1.00	0.50	14695	751	106	14	2



Table 5.5. Comparative verification of NCM and LFM MOS surface wind forecasts for 27 stations in the Southern Region, 0000 UTC cycle. Data for TCC were not available for the 12- and 24-h projections.

Fest Proj (h)	Direction				Speed										
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table					
										Bias by Category		Bias by Category		Bias by Category	
										1	2	3	4	5	6
										No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs
12	LFM	23	0.472	321	3.3	1.6	325	94.9	*	1.01	0.92	0.67	0.00	*	*
	NGM	21	0.533		3.3	1.6		94.9	*	1.01	0.88	1.25	0.00	*	*
18	LFM	26	0.430	1074	3.1	1.1	1078	84.6	*	1.02	0.92	0.85	0.57	*	*
	NGM	25	0.456		3.4	1.9		82.6	0.00	0.97	1.12	1.32	1.07	**	*
24	LFM	26	0.436	912	3.3	1.2	915	86.2	0.18	1.01	0.99	0.75	0.41	0.18	*
	NGM	26	0.421		3.4	1.8		85.3	0.14	0.98	1.14	1.03	1.12	0.36	**
										3726	406	96	17	11	0

Table 5.6. Same as Table 5.5 except for 26 stations for the 1200 UTC cycle. Data for TCC were not available.

Fest Proj (h)	Direction				Speed										
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table					
										Bias by Category		Bias by Category		Bias by Category	
										1	2	3	4	5	6
										No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs
12	LFM	22	0.470	819	3.3	1.1	820	86.1	0.00	1.02	0.94	0.76	0.38	0.00	*
	NGM	22	0.484		3.3	1.7		85.3	0.23	0.99	1.08	1.02	1.25	0.36	**
18	LFM	26	0.337	384	3.7	2.1	388	92.1	0.00	1.00	1.19	0.63	0.00	0.00	0.00
	NGM	26	0.423		3.5	1.5		93.2	0.00	1.01	0.88	0.59	0.00	0.00	0.00
24	LFM	25	0.462	264	3.7	2.1	266	94.3	*	1.00	0.97	1.00	0.00	*	*
	NGM	26	0.445		3.3	1.6		95.0	*	1.01	0.75	0.58	0.00	*	*
										4024	154	12	4	0	0

\* This category was neither forecast nor observed.  
 \*\* This category was forecast but was not observed.



Table 5.7. Comparative verification of NCM and LFM MOS surface wind forecasts for 28 stations in the Central Region, 0000 UTC cycle.

Fcst Proj (h)	Direction										Speed									
	Direction					Contingency Table					Direction					Contingency Table				
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	1 No. Obs	2 No. Obs	3 No. Obs	4 No. Obs	5 No. Obs	6 No. Obs				
12	LFM	19	0.578	652	3.0	1.2	654	0.372	91.1	0.00	1.02	0.80	0.96	1.43	*	0.00				
	NGM	21	0.569		3.5	2.1		0.359	89.1	0.00	0.98	1.14	1.76	1.43	**	0.00				
18	LFM	22	0.523	1667	3.1	-0.4	1669	0.344	75.3	0.07	1.14	0.66	0.60	0.49	0.38	0.33				
	NGM	21	0.540		3.2	1.2		0.405	73.9	0.05	0.99	0.95	1.29	1.24	1.00	0.33				
24	LFM	29	0.449	1372	3.5	0.1	1374	0.271	77.5	0.00	1.11	0.64	0.55	0.40	0.40	0.00				
	NGM	29	0.439		3.9	2.1		0.323	73.5	0.05	0.95	1.12	1.34	1.53	1.40	2.00				
											3600	789	204	30	5	3				

Table 5.8. Same as Table 5.7 except for the 1200 UTC cycle.

Fcst Proj (h)	Direction										Speed									
	Direction					Contingency Table					Direction					Contingency Table				
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	1 No. Obs	2 No. Obs	3 No. Obs	4 No. Obs	5 No. Obs	6 No. Obs				
12	LFM	25	0.499	1397	3.3	0.2	1402	0.301	78.3	0.00	1.10	0.66	0.56	0.46	0.80	0.00				
	NGM	25	0.508		3.6	1.8		0.359	75.5	0.14	0.96	1.09	1.23	1.75	1.20	0.67				
18	LFM	25	0.515	653	3.4	0.8	659	0.306	89.6	0.00	1.04	0.68	0.46	0.55	*	0.00				
	NGM	25	0.517		4.2	2.2		0.268	85.4	0.00	0.97	1.21	1.26	1.82	**	1.00				
24	LFM	24	0.484	502	3.5	1.1	506	0.326	91.0	0.00	1.03	0.61	1.06	0.86	*	0.00				
	NGM	24	0.516		3.7	1.9		0.344	89.4	0.00	0.99	1.00	1.51	1.43	**	1.00				
											4225	335	47	7	0	1				

\* This category was neither forecast nor observed.

\*\* This category was forecast but was not observed.

Table 5.9. Comparative verification of NCM and LFM MOS surface wind forecasts for 18 stations in the Western Region, 0000 UTC cycle.

Fest Proj (h)	Type of Fcst.	Direction				Speed																
		Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table												
		Skill Score		No. of Cases		Mean Abs. Error (kt)		Mean Alg. Error (kt)		No. of Cases		Percent Fcst. Correct		Threat Score (>27 kt)		Bias by Category						
1	2	3	4	5	6	1	2	3	4	5	6	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs					
12	LFM	24	0.519	251	3.9	2.4	254	94.4	0.00	0.302	1.27	1.13	0.00	0.00	0.00	0.00	0.00	0.00				
	NGM	26	0.436		4.4	3.3		92.9	0.20	0.251	1.46	2.13	5.00	1.00	1.00	1.00	1.00	1.00				
18	LFM	35	0.269	496	3.5	1.0	498	88.0	0.00	0.381	0.83	0.75	1.08	0.00	0.00	0.00	0.00	0.00				
	NGM	34	0.352		4.0	1.7		85.5	0.10	0.336	1.08	0.96	1.33	0.60	2.00	2.00	2.00	2.00				
24	LFM	30	0.334	1021	3.6	1.3	1030	72.7	0.00	0.311	0.95	0.84	0.69	0.43	**	**	**	**				
	NGM	31	0.335		4.0	2.1		70.9	0.07	0.299	0.91	1.16	1.81	0.71	**	**	**	**				
											2217	563	172	32	7	0						

Table 5.10. Same as Table 5.9 except for the 1200 UTC cycle.

Fest Proj (h)	Type of Fcst.	Direction				Speed																
		Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table												
		Skill Score		No. of Cases		Mean Abs. Error (kt)		Mean Alg. Error (kt)		No. of Cases		Percent Fcst. Correct		Threat Score (>27 kt)		Bias by Category						
1	2	3	4	5	6	1	2	3	4	5	6	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs					
12	LFM	28	0.363	1062	3.3	0.9	1068	73.3	0.11	0.333	0.95	0.77	0.82	0.25	*	*	*	*				
	NGM	28	0.366		3.7	1.9		71.8	0.00	0.331	0.88	1.21	1.97	0.63	**	**	**	**				
18	LFM	28	0.425	353	3.3	1.4	354	91.0	*	0.256	0.65	0.47	0.20	*	*	*	*					
	NGM	28	0.371		4.4	2.8		87.3	0.00	0.226	1.23	1.33	1.40	**	*	*	*					
24	LFM	26	0.441	185	3.5	1.1	186	95.6	0.00	0.321	0.81	0.28	0.00	0.00	0.00	0.00	0.00					
	NGM	25	0.392		4.2	2.3		93.5	0.33	0.263	0.99	1.30	1.61	4.00	0.50	0.00	0.00					
											2846	94	18	1	2	1						

\* This category was neither forecast nor observed.  
 \*\* This category was forecast but was not observed.

Table 5.11. Verification of LFM MOS surface wind forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Fcst Proj (h)	Type of Fcst.	Direction					Speed											
		Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table							
								Bias by Category										
						1	2	3	4	5	6							
						No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs
12	LFM	28	0.460	169	3.7	2.3	170	0.341	91.9	*	0.99	1.33	0.78	0.00	*	*	*	*
18	LFM	34	0.340	216	3.6	2.1	220	0.450	89.9	0.00	1.01	0.85	1.00	3.00	0.00	*	*	*
24	LFM	43	0.309	490	4.2	2.7	491	0.224	72.5	0.00	0.94	1.30	1.19	1.33	2.00	*	*	*
						819	149	37	3	1	0	0	0	0	0	0	0	0

Table 5.12. Same as Table 5.11 except for the 1200 UTC cycle.

Fcst Proj (h)	Type of Fcst.	Direction					Speed											
		Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table							
								Bias by Category										
						1	2	3	4	5	6							
						No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs
12	LFM	37	0.373	423	3.6	1.9	425	0.309	77.4	0.00	1.01	1.01	0.68	2.50	0.00	*	*	*
18	LFM	37	0.337	249	4.1	2.1	252	0.254	85.8	0.00	1.02	0.95	0.68	0.40	0.00	*	*	*
24	LFM	32	0.316	200	4.4	3.1	204	0.241	89.9	*	0.98	1.33	1.22	1.00	*	*	*	
						948	52	9	1	0	0	0	0	0	0	0	0	0

\* This category was neither forecast nor observed.

Table 5.13. Verification of local surface wind forecasts for 94 stations in the conterminous U.S. for the FT issuance time of approximately 0900 UTC.

Fest Proj (h)	Direction					Speed																
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table											
											Bias by Category											
												1	2	3	4	5	6					
												No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs					
3	LOCAL	26	0.501	3628	3.5	2.5	3686	0.400	93.5	0.00	0.99	1.31	0.80	0.59	0.00	0.00	14987	690	102	17	2	1
9	LOCAL	34	0.379	8183	3.3	1.7	8249	0.345	80.0	0.04	1.00	1.11	0.65	0.58	0.54	0.00	12944	2275	465	59	13	5
15	LOCAL	36	0.358	9015	3.4	1.9	9077	0.319	77.3	0.03	0.98	1.19	0.81	0.52	0.39	0.00	12770	2398	534	73	18	5

Table 5.14. Same as Table 5.13 except for 95 stations for the FT issuance time of approximately 1800 UTC.

Fest Proj (h)	Direction					Speed																
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table											
											Bias by Category											
												1	2	3	4	5	6					
												No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs					
3	LOCAL	30	0.433	9484	2.9	1.3	9526	0.407	78.6	0.23	1.00	1.05	0.80	0.48	0.52	1.50	12408	2814	638	107	25	2
9	LOCAL	39	0.329	5606	4.3	3.3	5737	0.236	86.4	0.00	0.96	1.53	1.01	0.47	0.00	0.50	14563	1041	188	30	6	2
15	LOCAL	40	0.331	3854	4.4	3.5	4001	0.242	91.1	0.00	0.98	1.41	0.78	0.06	0.50	0.00	14988	712	122	16	2	1

Table 5.15. Verification of local surface wind forecasts for 24 stations in the Eastern Region for the FT issuance time of approximately 0900 UTC.

Fcst Proj (h)	Direction						Speed									
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table					
											Bias by Category					
										1	2	3	4	5	6	
										No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	
3	LOCAL	25	0.479	892	3.3	2.5	903	0.380	94.4	*	1.00	1.19	0.59	0.67	*	
											3860	155	22	3	0	
9	LOCAL	36	0.346	2197	2.9	1.4	2202	0.290	80.9	0.00	1.02	0.95	0.41	0.58	0.00	
											3356	581	76	12	1	
15	LOCAL	39	0.294	2017	3.4	2.3	2030	0.233	82.4	0.00	0.98	1.22	0.73	1.00	0.00	
											3556	422	56	5	2	

Table 5.16. Same as Table 5.15 except for the FT issuance time of approximately 1800 UTC.

Fcst Proj (h)	Direction						Speed									
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table					
											Bias by Category					
										1	2	3	4	5	6	
										No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	
3	LOCAL	31	0.398	2317	2.6	1.0	2323	0.326	79.9	0.50	1.06	0.81	0.55	0.38	0.50	
											3250	699	95	13	4	
9	LOCAL	41	0.300	1149	4.3	3.5	1191	0.205	90.3	0.00	0.99	1.29	0.92	0.50	0.00	
											3827	208	24	2	1	
15	LOCAL	42	0.297	903	4.5	3.8	944	0.254	93.5	*	0.99	1.38	1.13	0.00	*	
											3908	140	16	3	0	

\* This category was neither forecast nor observed.

Table 5.17. Verification of local surface wind forecasts for 24 stations in the Southern Region for the FT issuance time of approximately 0900 UTC.

Fcast Proj (h)	Direction						Speed									
	Type of Fcast.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table						
										Bias by Category		Bias by Category		Bias by Category		Bias by Category
									1	2	3	4	5	6		
									No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs		
3	LOCAL	27	0.483	702	3.7	2.7	717	0.392	95.4	*	0.99	1.39	0.71	0.00	*	
											3948	119	17	3	0	
9	LOCAL	33	0.351	1838	3.3	2.2	1862	0.362	85.9	0.00	0.99	1.20	0.44	1.25	0.00	*
											3594	414	66	4	1	0
15	LOCAL	36	0.344	2044	3.4	2.3	2058	0.337	84.1	0.14	0.97	1.36	0.54	0.60	0.14	*
											3587	418	70	10	7	0

Table 5.18. Same as Table 5.17 except for 25 stations for the FT issuance time of approximately 1800 UTC.

Fcast Proj (h)	Direction						Speed									
	Type of Fcast.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table						
										Bias by Category		Bias by Category		Bias by Category		Bias by Category
									1	2	3	4	5	6		
									No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs		
3	LOCAL	30	0.387	2157	3.0	1.8	2176	0.400	84.0	0.00	0.99	1.16	0.66	0.47	2.00	2.00
											3596	522	90	17	1	1
9	LOCAL	38	0.272	1145	4.4	3.5	1182	0.186	90.8	0.00	0.98	1.43	0.67	0.25	0.00	**
											3854	176	27	8	2	0
15	LOCAL	37	0.327	749	4.5	3.6	781	0.171	93.5	*	0.99	1.21	0.87	0.00	*	*
											3912	137	15	1	0	0

\* This category was neither forecast nor observed.  
 \*\* This category was forecast but was not observed.

Table 5.19. Verification of local surface wind forecasts for 28 stations in the Central Region for the FT issuance time of approximately 0900 UTC.

Fest Proj Fcst. (h)	Direction					Speed											
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table						
											Bias by Category						
												1	2	3	4	5	6
												No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs
3	LOCAL	25	0.515	1480	3.2	2.2	1492	0.429	90.0	*		0.97	1.35	0.91	0.67	*	*
												4213	330	44	9	0	0
9	LOCAL	30	0.417	2917	3.2	1.4	2935	0.351	71.7	0.00		0.96	1.25	0.69	0.52	0.67	0.00
												3337	971	237	33	6	3
15	LOCAL	35	0.372	3063	3.4	1.7	3079	0.300	68.5	0.00		0.92	1.34	0.80	0.67	1.00	0.00
												3344	970	241	30	4	2

\* This category was neither forecast nor observed.

Table 5.20. Same as Table 5.19 except for the FT issuance time of approximately 1800 UTC.

Fest Proj Fcst. (h)	Direction					Speed											
	Type of Fcst.	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table						
											Bias by Category						
												1	2	3	4	5	6
												No. Obs	No. Obs	No. Obs	No. Obs	No. Obs	No. Obs
3	LOCAL	27	0.483	3242	2.8	1.0	3250	0.423	72.4	0.18		0.97	1.20	0.75	0.45	0.20	**
												3159	1095	307	51	10	0
9	LOCAL	39	0.332	2113	4.2	3.2	2144	0.270	81.1	0.00		0.92	1.85	0.90	0.43	0.00	0.00
												4110	413	83	14	2	1
15	LOCAL	38	0.348	1585	4.2	3.2	1631	0.257	86.0	0.00		0.96	1.58	0.73	0.00	1.00	0.00
												4230	322	64	9	1	1

\*\* This category was forecast but was not observed.

Table 5.21. Verification of local surface wind forecasts for 18 stations in the Western Region for the FT issuance time of approximately 0900 UTC.

Fcst Proj (h)	Direction						Speed									
	Mean			Contingency Table			Percent Fcst. Correct			Threat Score (>27 kt)			Bias by Category			
	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	No. of Cases	Percent Fcst. Correct	Threat Score (>27 kt)	1 No. Obs	2 No. Obs	3 No. Obs	4 No. Obs	5 No. Obs	6 No. Obs
3	31	0.447	554	4.0	2.9	574	0.302	574	94.7	0.00	0.99	1.29	0.89	1.00	0.00	0.00
9	41	0.299	1231	3.9	2.2	1250	0.268	1250	83.6	0.13	1.02	0.87	0.88	0.50	0.60	0.00
15	38	0.311	1891	3.2	1.3	1910	0.331	1910	74.6	0.00	1.07	0.79	0.97	0.25	0.40	0.00

Table 5.22. Same as Table 5.21 except for the FT issuance time of approximately 1800 UTC.

Fcst Proj (h)	Direction						Speed									
	Mean			Contingency Table			Percent Fcst. Correct			Threat Score (>27 kt)			Bias by Category			
	Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	No. of Cases	Percent Fcst. Correct	Threat Score (>27 kt)	1 No. Obs	2 No. Obs	3 No. Obs	4 No. Obs	5 No. Obs	6 No. Obs
3	35	0.354	1768	3.2	1.6	1777	0.405	1777	78.6	0.29	1.01	0.94	1.14	0.58	0.70	0.00
9	41	0.313	1199	4.2	3.1	1220	0.194	1220	83.5	0.00	0.97	1.27	1.37	0.83	0.00	0.00
15	45	0.252	617	4.6	3.5	645	0.213	645	92.6	0.00	1.00	1.23	0.63	0.33	0.00	*

\* This category was neither forecast nor observed.



Table 5.23. Verification of local surface wind forecasts for 6 stations in the Alaska Region for the FT issuance time of approximately 0900 UTC.

Fcst Proj (h)	Type of Fcst.	Direction				Speed																
		Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table											
											Bias by Category		Bias by Category		Bias by Category		Bias by Category					
		1		2		3		4		5		6										
		No.	Obs	No.	Obs	No.	Obs	No.	Obs	No.	Obs	No.	Obs									
3	LOCAL	23	0.531	291	3.5	2.6	295	0.428	93.0	*	0.99	1.02	1.56	1.50	*	959	52	9	2	0	0	
9	LOCAL	38	0.340	293	3.7	2.2	300	0.313	88.3	0.00	1.04	0.63	1.06	2.00	0.00	*	903	92	16	1	1	0
15	LOCAL	45	0.285	336	3.9	1.2	339	0.181	79.4	0.00	1.11	0.50	0.61	0.25	0.00	*	830	148	36	4	1	0

\* This category was neither forecast nor observed.

Table 5.24. Same as Table 5.23 except for the FT issuance time of approximately 1800 UTC.

Fcst Proj (h)	Type of Fcst.	Direction				Speed																
		Mean Abs. Error (deg)	Skill Score	No. of Cases	Mean Abs. Error (kt)	Mean Alg. Error (kt)	No. of Cases	Skill Score	Percent Fcst. Correct	Threat Score (>27 kt)	Contingency Table											
											Bias by Category		Bias by Category		Bias by Category		Bias by Category					
		1		2		3		4		5		6										
		No.	Obs	No.	Obs	No.	Obs	No.	Obs	No.	Obs	No.	Obs									
3	LOCAL	33	0.409	500	3.1	1.2	502	0.328	80.3	0.00	1.07	0.75	0.51	0.75	0.00	*	826	163	39	4	1	0
9	LOCAL	46	0.279	471	4.7	3.5	493	0.202	81.4	0.00	0.95	1.49	1.21	0.60	0.00	*	920	87	19	5	2	0
15	LOCAL	52	0.217	462	5.4	4.8	485	0.151	83.5	*	0.91	2.25	2.89	0.00	0.00	*	972	56	9	1	0	0

\* This category was neither forecast nor observed.

Table 5.25. Comparative verification of local, LFM MOS, and NGM MOS 42-h significant wind speed forecasts for 95 stations in the conterminous U.S. for the 0000 UTC cycle.

Type of Verifying Observation	Type of Forecast	Bias by Category		Skill Score	Percent Forecast Correct	Threat Score >22 kt
		≤ 22 kt	> 22 kt			
1-min Avg	LOCAL	0.98	5.68	0.082	97.1	0.05
	LFM MOS	1.00	0.61	0.158	99.3	0.09
	NGM MOS	1.00	1.58	0.156	99.0	0.09
	No. Obs.	15839	77			
± 3-h Max	LOCAL	0.99	1.30	0.193	96.2	0.12
	LFM MOS	1.02	0.14	0.100	97.9	0.06
	NGM MOS	1.01	0.36	0.197	97.7	0.11
	No. Obs.	15577	335			

Table 5.26. Same as Table 5.25 except for 94 stations for the 1200 UTC cycle. Data for TCC were not available.

Type of Verifying Observation	Type of Forecast	Bias by Category		Skill Score	Percent Forecast Correct	Threat Score >22 kt
		≤ 22 kt	> 22 kt			
1-min Avg	LOCAL	0.98	8.10	0.013	97.8	0.01
	LFM MOS	1.00	0.13	-0.001	99.7	0.00
	NGM MOS	1.00	0.92	0.078	99.6	0.04
	No. Obs.	15624	39			
± 3-h Max	LOCAL	1.00	0.99	0.086	96.4	0.05
	LFM MOS	1.02	0.02	-0.001	97.9	0.00
	NGM MOS	1.02	0.11	0.041	97.8	0.02
	No. Obs.	15336	319			

Table 5.27. Comparative verification of local and LFM MOS 42-h significant wind forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Type of Verifying Observation	Type of Forecast	Bias by Category		Skill Score	Percent Forecast Correct	Threat Score >22 kt
		≤ 22 kt	> 22 kt			
1-min Avg	LOCAL	0.99	6.00	-0.003	98.6	0.00
	LFM MOS	1.00	1.50	-0.002	99.5	0.00
	No. Obs.	990	2			
± 3-h Max	LOCAL	1.00	1.09	0.252	98.3	0.15
	LFM MOS	1.01	0.27	0.139	98.8	0.08
	No. Obs.	980	11			

Table 5.28. Same as Table 5.27 except for the 1200 UTC cycle.

Type of Verifying Observation	Type of Forecast	Bias by Category		Skill Score	Percent Forecast Correct	Threat Score >22 kt
		≤ 22 kt	> 22 kt			
1-min Avg	LOCAL	0.99	2.50	0.133	97.6	0.08
	LFM MOS	1.01	0.13	0.221	99.3	0.13
	No. Obs.	997	8			
± 3-h Max	LOCAL	1.00	1.18	0.147	96.9	0.09
	LFM MOS	1.02	0.06	0.109	98.4	0.06
	No. Obs.	987	17			

Table 6.1. Comparative verification of LFM MOS and persistence ceiling height forecasts for 94 stations in the conterminous U.S., 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
12	MOS	0.86	0.77	0.90	1.03	2.436	81.5	0.330
	PERSISTENCE	0.69	0.78	0.82	1.04	1.543	87.6	0.536
	No. Obs.	528	743	1270	12730			
18	MOS	0.81	0.67	0.96	1.01	1.187	85.2	0.341
	PERSISTENCE	4.55	1.97	0.65	1.00	1.814	83.4	0.296
	No. Obs.	77	292	1622	13166			
24	MOS	1.24	1.03	0.90	1.00	0.790	91.8	0.262
	PERSISTENCE	5.34	3.71	1.53	0.92	1.827	85.0	0.171
	No. Obs.	67	155	671	13938			

Table 6.2. Same as Table 6.1 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
12	MOS	1.31	0.89	0.93	1.00	0.740	92.3	0.315
	PERSISTENCE	0.73	1.25	1.37	0.98	0.562	93.3	0.486
	No. Obs.	71	148	659	13679			
18	MOS	1.37	0.80	0.91	1.00	1.461	88.6	0.329
	PERSISTENCE	0.25	0.50	1.15	1.02	1.172	88.9	0.306
	No. Obs.	219	372	805	13632			
24	MOS	1.75	0.67	0.92	1.00	3.105	79.4	0.308
	PERSISTENCE	0.10	0.24	0.74	1.11	2.305	81.6	0.179
	No. Obs.	522	738	1236	12494			

Table 6.3. Comparative verification of LFM MOS and persistence ceiling height forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
12	MOS	0.79	0.77	1.57	0.94	2.498	76.0	0.362
	PERSISTENCE	0.52	1.05	0.85	1.04	1.550	86.4	0.573
	No. Obs.	33	43	115	764			
18	MOS	1.00	0.70	1.60	0.91	2.701	72.0	0.347
	PERSISTENCE	0.80	0.67	0.71	1.09	2.352	78.2	0.364
	No. Obs.	20	67	139	736			
24	MOS	0.60	1.60	1.62	0.87	1.845	75.5	0.369
	PERSISTENCE	3.00	1.50	0.68	1.03	1.917	79.7	0.332
	No. Obs.	5	30	141	772			

Table 6.4. Same as Table 6.3 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
12	MOS	1.40	1.40	1.28	0.93	1.630	79.9	0.451
	PERSISTENCE	2.00	1.11	1.21	0.95	1.260	84.1	0.550
	No. Obs.	5	35	149	784			
18	MOS	1.29	1.02	1.81	0.90	2.022	76.8	0.313
	PERSISTENCE	1.43	0.90	1.75	0.91	1.819	79.1	0.366
	No. Obs.	7	42	102	827			
24	MOS	1.19	1.27	1.72	0.86	3.335	69.0	0.277
	PERSISTENCE	0.31	0.91	1.40	0.97	2.407	75.4	0.331
	No. Obs.	32	45	127	776			

Table 6.5. Comparative verification of local and persistence ceiling height forecasts for 94 stations in the conterminous U.S. for the FT issuance time of approximately 0900 UTC.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
3	LOCAL	0.63	0.76	1.03	1.03	1.709	86.0	0.484
	PERSISTENCE	0.60	0.71	0.82	1.05	1.498	88.0	0.529
	No. Obs.	538	726	1296	13235			
6	LOCAL	0.38	0.52	0.95	1.05	1.778	83.0	0.393
	PERSISTENCE	1.02	0.61	0.63	1.07	1.865	83.6	0.393
	No. Obs.	318	844	1682	12930			
9	LOCAL	0.26	0.30	0.68	1.07	1.169	85.4	0.308
	PERSISTENCE	3.94	1.47	0.57	1.03	1.766	83.0	0.289
	No. Obs.	82	352	1849	13475			
15	LOCAL	0.17	0.37	1.12	1.01	0.688	91.7	0.282
	PERSISTENCE	5.14	2.95	1.38	0.94	1.631	86.0	0.187
	No. Obs.	63	175	762	14784			

Table 6.6. Same as Table 6.5 except for 95 stations for the FT issuance time of approximately 1800 UTC.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
3	LOCAL	0.53	0.66	1.16	0.99	0.698	90.8	0.446
	PERSISTENCE	1.31	1.78	1.65	0.94	0.890	88.7	0.462
	No. Obs.	62	204	1121	14579			
6	LOCAL	0.43	0.60	1.47	0.98	0.696	91.4	0.356
	PERSISTENCE	1.25	2.06	2.44	0.91	1.130	86.2	0.283
	No. Obs.	65	177	757	14810			
9	LOCAL	0.41	0.58	1.65	0.98	0.831	90.7	0.338
	PERSISTENCE	0.82	1.39	2.69	0.92	1.296	85.1	0.240
	No. Obs.	98	261	684	14755			
15	LOCAL	0.33	0.82	1.55	0.98	1.657	84.9	0.347
	PERSISTENCE	0.25	0.70	1.77	0.97	1.876	81.6	0.228
	No. Obs.	326	521	1041	13914			

Table 6.7. Comparative verification of local and persistence ceiling height forecasts for 6 stations in the Alaska Region for the FT issuance time of approximately 0900 UTC.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
3	LOCAL	0.69	0.75	0.98	1.03	1.608	86.5	0.581
	PERSISTENCE	0.51	1.02	0.83	1.04	1.631	85.9	0.552
	No. Obs.	35	44	121	807			
6	LOCAL	0.52	0.76	0.98	1.04	2.424	80.0	0.425
	PERSISTENCE	0.41	1.00	0.76	1.07	2.312	80.2	0.405
	No. Obs.	44	45	135	788			
9	LOCAL	0.64	0.35	0.88	1.09	2.338	78.0	0.356
	PERSISTENCE	0.82	0.64	0.68	1.10	2.391	78.0	0.355
	No. Obs.	22	69	145	762			
15	LOCAL	1.20	0.47	0.83	1.05	1.546	81.4	0.351
	PERSISTENCE	3.60	1.41	0.67	1.03	1.930	79.9	0.337
	No. Obs.	5	32	151	817			

Table 6.8. Same as Table 6.7 except for the FT issuance time of approximately 1800 UTC.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
3	LOCAL	1.00	0.51	1.01	1.02	1.271	82.7	0.446
	PERSISTENCE	2.00	1.14	1.19	0.95	1.258	84.0	0.546
	No. Obs.	5	35	159	828			
6	LOCAL	0.83	0.47	1.24	0.98	1.546	80.4	0.350
	PERSISTENCE	1.67	1.28	1.39	0.92	1.628	80.5	0.425
	No. Obs.	6	32	136	844			
9	LOCAL	0.50	0.37	1.59	0.96	1.716	79.9	0.339
	PERSISTENCE	1.25	0.93	1.69	0.91	1.854	78.8	0.366
	No. Obs.	8	43	113	863			
15	LOCAL	0.22	0.50	1.66	0.95	2.636	72.9	0.265
	PERSISTENCE	0.31	0.89	1.42	0.96	2.404	75.0	0.313
	No. Obs.	32	46	133	821			

Table 7.1. Comparative verification of LFM MOS and persistence visibility forecasts for 94 stations in the conterminous U.S., 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
12	MOS	1.27	1.16	1.11	0.95	2.837	71.8	0.371
	PERSISTENCE	0.53	0.42	0.76	1.12	1.776	81.0	0.488
	No. Obs.	375	896	2827	11206			
18	MOS	0.80	0.74	1.31	0.97	1.158	84.7	0.352
	PERSISTENCE	5.46	1.44	1.39	0.94	1.684	81.4	0.290
	No. Obs.	35	257	1548	13391			
24	MOS	0.81	1.19	1.27	0.97	1.070	86.1	0.339
	PERSISTENCE	6.26	1.82	1.58	0.92	1.768	80.6	0.226
	No. Obs.	31	205	1352	13651			

Table 7.2. Same as Table 7.1 except for 95 stations for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
12	MOS	1.35	1.13	1.21	0.98	1.087	86.6	0.351
	PERSISTENCE	0.74	0.95	0.97	1.00	0.611	92.6	0.601
	No. Obs.	34	200	1327	13398			
18	MOS	3.23	1.57	0.98	0.98	1.588	84.0	0.349
	PERSISTENCE	0.27	0.88	0.80	1.03	1.037	87.6	0.400
	No. Obs.	91	216	1628	13132			
24	MOS	2.14	1.45	1.10	0.90	3.473	69.2	0.350
	PERSISTENCE	0.07	0.21	0.47	1.23	2.588	74.1	0.203
	No. Obs.	377	876	2771	10998			



Table 7.3. Comparative verification of LFM MOS and persistence visibility forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
12	MOS	0.17	1.06	0.67	1.04	1.262	87.0	0.383
	PERSISTENCE	0.92	1.00	0.67	1.03	0.840	90.9	0.578
	No. Obs.	12	33	83	834			
18	MOS	0.00	0.63	0.76	1.05	1.376	86.6	0.277
	PERSISTENCE	1.10	0.80	0.82	1.02	1.387	87.4	0.384
	No. Obs.	10	41	67	858			
24	MOS	*	0.89	0.74	1.02	0.706	91.3	0.357
	PERSISTENCE	**	1.22	1.12	0.97	1.267	87.3	0.256
	No. Obs.	0	27	50	890			

Table 7.4. Same as Table 7.3 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
12	MOS	*	0.90	0.94	1.01	0.815	90.2	0.346
	PERSISTENCE	**	1.17	1.21	0.98	0.659	92.5	0.560
	No. Obs.	0	30	52	912			
18	MOS	0.00	0.82	0.87	1.02	1.074	88.7	0.293
	PERSISTENCE	1.00	0.89	1.19	0.99	0.909	90.0	0.444
	No. Obs.	3	38	52	897			
24	MOS	0.88	1.39	0.99	0.99	1.784	83.3	0.340
	PERSISTENCE	0.19	1.16	0.70	1.04	1.448	85.4	0.332
	No. Obs.	16	31	88	853			

\* This category was neither forecast nor observed.  
 \*\* This category was forecast but was not observed.

Table 7.5. Comparative verification of local and persistence visibility forecasts for 94 stations in the conterminous U.S. for the FT issuance time of approximately 0900 UTC.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
3	LOCAL	0.52	0.48	1.18	1.01	1.862	79.6	0.478
	PERSISTENCE	0.41	0.43	0.75	1.11	1.598	83.2	0.510
	No. Obs.	388	771	2740	11894			
6	LOCAL	0.32	0.29	1.01	1.05	1.713	79.5	0.385
	PERSISTENCE	1.06	0.48	0.79	1.07	1.758	80.5	0.393
	No. Obs.	151	700	2601	12321			
9	LOCAL	0.22	0.15	0.84	1.04	0.978	86.8	0.342
	PERSISTENCE	4.30	1.17	1.20	0.96	1.529	82.7	0.322
	No. Obs.	37	284	1707	13729			
15	LOCAL	0.13	0.17	0.82	1.03	0.824	88.9	0.291
	PERSISTENCE	4.97	1.69	1.55	0.93	1.590	82.1	0.227
	No. Obs.	32	197	1318	14236			

Table 7.6. Same as Table 7.5 except for 95 stations for the FT issuance time of approximately 1800 UTC.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
3	LOCAL	0.41	0.39	1.15	1.00	0.689	90.8	0.495
	PERSISTENCE	1.22	1.40	1.28	0.97	0.689	91.5	0.583
	No. Obs.	32	210	1329	14395			
6	LOCAL	0.28	0.39	1.09	1.00	0.769	89.8	0.424
	PERSISTENCE	1.22	1.47	1.28	0.97	0.939	88.5	0.436
	No. Obs.	32	199	1322	14256			
9	LOCAL	0.44	0.48	1.12	1.00	0.867	88.2	0.382
	PERSISTENCE	1.15	1.72	1.18	0.97	1.020	87.2	0.388
	No. Obs.	34	170	1436	14159			
15	LOCAL	0.45	0.76	1.25	0.97	1.585	81.3	0.365
	PERSISTENCE	0.24	0.87	0.82	1.04	1.501	83.1	0.337
	No. Obs.	161	336	2060	13245			

Table 7.7. Comparative verification of local and persistence visibility forecasts for 6 stations in the Alaska Region for the FT issuance time of approximately 0900 UTC.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
3	LOCAL	0.81	0.69	0.91	1.02	0.851	90.3	0.567
	PERSISTENCE	0.88	1.00	0.69	1.03	0.855	91.1	0.593
	No. Obs.	16	32	86	867			
6	LOCAL	0.44	0.47	0.98	1.05	1.841	84.2	0.359
	PERSISTENCE	0.56	0.68	0.69	1.06	1.760	85.8	0.403
	No. Obs.	25	47	86	851			
9	LOCAL	0.55	0.38	0.91	1.04	1.356	87.0	0.326
	PERSISTENCE	1.27	0.76	0.81	1.02	1.435	87.3	0.389
	No. Obs.	11	42	69	871			
15	LOCAL	*	0.30	1.13	1.01	0.880	90.0	0.265
	PERSISTENCE	*	1.07	1.23	0.97	1.319	87.2	0.252
	No. Obs.	0	30	48	924			

Table 7.8. Same as Table 7.7 except for the FT issuance time of approximately 1800 UTC.

Projection (h)	Type of Forecast	Bias by Category				Log Score	Percent Correct	Skill Score
		1	2	3	4			
3	LOCAL	*	0.47	1.27	1.00	0.769	90.7	0.375
	PERSISTENCE	*	1.20	1.27	0.98	0.606	93.1	0.588
	No. Obs.	0	30	51	945			
6	LOCAL	2.00	0.33	1.39	1.00	0.894	90.0	0.288
	PERSISTENCE	3.00	1.09	1.50	0.97	0.792	91.3	0.485
	No. Obs.	1	33	44	938			
9	LOCAL	0.50	0.21	1.38	1.01	1.062	88.0	0.252
	PERSISTENCE	0.75	0.92	1.29	0.99	0.898	90.3	0.459
	No. Obs.	4	38	52	932			
15	LOCAL	0.28	0.48	0.98	1.03	1.645	83.9	0.250
	PERSISTENCE	0.17	1.24	0.75	1.03	1.446	85.5	0.326
	No. Obs.	18	29	89	892			

\* This category was forecast but was not observed.

