U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE
OFFICE OF SYSTEMS DEVELOPMENT
TECHNIQUES DEVELOPMENT LABORATORY

TDL OFFICE NOTE 91-2

AFOS-ERA VERIFICATION OF GUIDANCE AND LOCAL AVIATION/PUBLIC WEATHER FORECASTS--NO. 11 (OCTOBER 1988 - MARCH 1989)

Valery J. Dagostaro and J. Paul Dallavalle

June 1991

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1. INTRODUCTION

This is the last in the series of Techniques Development Laboratory (TDL) office notes which compare in detail the performance of TDL's automated guidance with National Weather Service (NWS) local forecasts made at Weather Service Forecast Offices (WSFO's). Verification summary reports for subsequent seasons will be presented in abbreviated TDL office notes. Verification statistics are presented here for the cool season months of October 1988 through March 1989 for probability of precipitation (PoP), precipitation type, snow amount, surface wind, cloud amount, ceiling height, visibility, and maximum/minimum (max/min) temperature. For the first time, forecasts for 6 stations in the NWS Alaska Region were verified for an entire season. Verification summaries are provided for both forecast cycles, 0000 and 1200 UTC. The scores are those recommended in the NWS National Verification Plan (National Weather Service, 1982a).

For the conterminous U.S., the local PoP and max/min forecasts used for verification were official public weather forecasts obtained from the Coded City Forecast (FPUS4) bulletin. The local cloud amount, precipitation type, snow amount, and 42-h significant wind forecasts were manually entered by the forecasters at the WSFO's. For the NWS Alaska Region, local forecasts were obtained from the FPAK4 bulletin for the public weather elements of PoP, max/min temperature, precipitation type, snow amount, cloud amount and 42-h significant wind. All local aviation weather element forecasts were obtained from the NWS official terminal forecasts (FT's). These subjective forecasts may or may not be based on the objective guidance. Also, surface observations as late as 2 hours before the first valid forecast time may have been used in preparation of the local forecasts.

The automated guidance was based on forecast equations developed through application of the Model Output Statistics (MOS) technique (Glahn and Lowry, 1972). In particular, these prediction equations were derived by using archived surface observations and forecast fields from the Limited-area Fine Mesh (LFM) model (Gerrity, 1977; Newell and Deaven, 1981). The surface observations used as predictors in these equations were taken at least 9 hours before the first verification valid time. For the conterminous U.S., the objective guidance was obtained from the FOUS12 bulletin, while guidance for the NWS Alaska Region was obtained from the FMAK1 and FMAK2 bulletins.

Due to a change in the issuance time of the FT's in December 1986, the projections of the local and guidance forecasts for the aviation weather elements (ceiling height, visibility, and wind speed and direction) no longer match. Moreover, the observations saved locally now correspond only to the valid time of the local forecasts. The issuance time of the local forecasts is based on local time rather than the forecast cycle. Although the actual time varies with time zone and changes from standard to daylight time, for simplicity, we will refer to the FT issuance times as if they occur at the same time for all stations. We verified the local forecasts associated with the FT issuance times of approximately 0900 and 1800 UTC. Persistence forecasts corresponding to the local

forecasts are also now based on the local time. Since the valid time of the automated guidance has not changed, it is no longer meaningful to perform a comparative verification for the aviation weather elements.

For the conterminous U.S., the local aviation weather element forecasts, along with the corresponding persistence and verifying observations, were collected locally at the WSFO's and were transmitted via the Automation of Field Operations and Services (AFOS) system to the National Meteorological Center (NMC). The automated guidance for these elements was also collected locally and transmitted to NMC, while the persistence and verifying observations corresponding to the guidance were taken from hourly reports archived centrally by TDL. For the remaining weather elements, including the 42-h significant wind, all of the forecasts (both local and guidance) and the verifying observations were collected locally at the WSFO's and transmitted to NMC. The local data collection system is described by Ruth and Alex (1987). Local data collection for Alaska's WSFO's is similar to that of the conterminous U.S., while data transmission to NMC differs considerably. Locally collected data were gathered on the Alaska Region's Prime computer system and were transmitted via the Federal Aviation Administration communication system to the Weather Message Switching Center and then to NMC. Verification data from all WSFO's were archived and processed centrally by TDL. The national AFOS-era verification data processing system is described in detail by Dagostaro (1985), while guidelines for the public/aviation forecast verification program are given in National Weather Service (1983a).

As noted in the following sections, implementation of the AFOS-era verification system has introduced significant changes from past verifications in regard to the characteristics of the local forecasts and the verifying observations. For example, the local and guidance max/min temperature forecasts for the conterminous U.S. stations are verified by using max/min temperatures observed during approximately 12-h periods instead of 24-h (calendar day) periods. Also, the cloud amount observations are given in terms of total sky cover rather than opaque sky cover. Hence, we do not think it is meaningful to compare results for the 1988-89 cool season with statistics based on the pre-AFOS verification system (e.g., Carter et al., 1983).

In addition, due to the change in the issuance time of the FT's, direct comparison of the local statistics with those for the guidance is no longer possible for the aviation weather elements. For the local aviation weather elements, direct comparison of results for the 1988-89 cool season with cool seasons prior to 1987-88 is also no longer meaningful.

2. PROBABILITY OF PRECIPITATION

Prior to February 8, 1989, MOS PoP forecasts for the conterminous U.S. were produced by the cool season prediction equations described in Technical Procedures Bulletin No. 289 (National Weather Service, 1980). For the remainder of the 1988-89 cool season, forecasts were produced by prediction equations that were rederived from the latest available LFM data. The revised PoP guidance is described in Technical Procedures Bulletin No. 386 (National Weather Service, 1990). In both cases, the guidance was available for the first, second, and third periods, which correspond to 12 - 24, 24 - 36, and 36 - 48 hours, respectively, after 0000 and 1200 UTC. For the NWS Alaska Region, MOS PoP forecasts were produced by the prediction equations described in Technical Procedures Bulletin No. 329 (National Weather Service, 1983b). In Alaska, the first, second, and third periods correspond to 6 - 18, 18 - 30, and 30 - 42 hours, respectively,

after 0000 and 1200 UTC. The predictors for the equation development were forecast variables from the LFM model and weather elements observed at the forecast site at 0300 or 1500 UTC. However, in day-to-day operations, surface observations at 0200 or 1400 UTC (or even 0100 or 1300 UTC) were used as input to the prediction equations. The LFM model schedule makes this necessary, and the guidance is available earlier than if the 0300 and 1500 UTC observations were used.

The forecasts were verified by computing Brier scores (Brier, 1950) for 99 of the 100 stations listed in Table 2.1. Note that we used the standard NWS Brier score for PoP which is one-half the original score defined by Brier. Brier scores vary from one station to the next and from one year to the next because of changes in the relative frequency of precipitation. Therefore, we also computed the percent improvement over climate, that is, the percent improvement of Brier scores obtained from the local or guidance forecasts over analogous Brier scores produced by climatic forecasts. Climatic forecasts are defined as relative frequencies of precipitation by month and by station determined from a 15-yr sample (Jorgensen, 1967). Because local forecasters are encouraged to depart from the guidance if they think it is incorrect, the Brier score was also computed when the local forecasters deviated from the guidance by at least 20%.

Tables 2.2 and 2.7 present the 1988-89 cool season results for all 93 conterminous U.S. stations combined for the 0000 and 1200 UTC cycle forecasts, respectively. Tables 2.3 - 2.6 and Tables 2.8 - 2.11 show scores for the NWS Eastern, Southern, Central, and Western Regions, for 0000 and 1200 UTC, respectively. Tables 2.12 and 2.13 show the NWS Alaska Region results for 0000 and 1200 UTC, respectively.

3. PRECIPITATION TYPE

The objective conditional probability of precipitation type (PoPT) forecast system for the conterminous U.S. described in Technical Procedures Bulletin No. 319 (National Weather Service, 1982c) and Bocchieri and Maglaras (1983) provides categorical forecasts for three categories: freezing (freezing rain or drizzle), frozen (snow or ice pellets), and liquid (rain). Precipitation in the form of mixed snow and ice pellets is included in the frozen category; any mixed precipitation type which includes freezing rain or drizzle is included in the freezing category; all other mixed precipitation types are included in the liquid category. In this report, the freezing, frozen, and liquid categories are referred to as freezing rain, snow, and rain, respectively. In contrast, the objective conditional probability of frozen (PoF) precipitation forecast system for Alaska, described in Technical Procedures Bulletin No. 329 (National Weather Service, 1983b), provides categorical forecasts for two categories: frozen (snow or ice pellets) and unfrozen. Precipitation in the form of freezing rain and mixed rain and snow are included with rain and drizzle in the unfrozen category. Note that the PoF guidance is also conditional and, therefore, is available whether or not precipitation occurs.

For verification purposes, local categorical forecasts of precipitation type are given for the 18-, 30-, and 42-h projections from 0000 and 1200 UTC. Note that this is a conditional forecast, that is, it's a forecast of the type of precipitation if precipitation actually occurs. Therefore, a precipitation type forecast is always recorded.

Table 3.1 lists the 86 stations in the conterminous U.S. used for the precipitation type verification. Stations in the NWS Alaska Region were not included in the comparative verification of local and objective precipitation type forecasts for two reasons: the PoPT and PoF forecast systems differ considerably and the objective PoF guidance is not transmitted from the WSFO's for central archiving. The verification sample included only those cases in which precipitation actually occurred within $\pm$ 1 hour of the forecast valid time. If a combination of precipitation types occurred during the 2-h period, the verifying observation was considered as freezing if freezing precipitation was observed at any time, or frozen if frozen (but not freezing) precipitation occurred. Note that an observation of mixed frozen and liquid precipitation types was included in the frozen category, while the guidance forecast the liquid category if mixed frozen and liquid precipitation was expected. Also, since we were concerned that some forecasters may not have put much effort into making the conditional forecasts when precipitation was considered unlikely, we used cases only when the local PoP was $\geq$ 30%. The PoP forecasts were valid for 12-h periods centered on the 18-, 30-, and 42-h projections from both 0000 and 1200 UTC.

Based on the three precipitation type categories, forecast-observed contingency tables were constructed. Bias by category,[1] probability of detection (POD),[2] false alarm ratio (FAR),[3] skill score,[4] and percent correct were calculated from contingency tables of precipitation type. Tables 3.2 and 3.3 show the verification results for the 0000 and 1200 UTC cycles, respectively. The number of freezing rain cases is small, and conclusions for that category must be made with caution.

4. SNOW AMOUNT

The objective probability of snow amount forecast system for the conterminous U.S. described in Technical Procedures Bulletin No. 318 (National Weather Service, 1982b) and by Bocchieri (1983) provides categorical forecasts for four categories of snow amount: $<$ 2, 2 or 3, 4 or 5, and $\geq$ 6 inches. In particular, prediction equations based on LFM model forecasts are used to produce conditional probabilities of snow amount for the three categories of $\geq$ 2, $\geq$ 4, and $\geq$ 6 inches. These conditional probabilities are converted to unconditional probability forecasts through the use of the MOS PoP and PoPT forecasts. The unconditional probability forecasts are converted to categorical forecasts through the use of the threshold technique described in Technical Procedures

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[1]In the discussion of precipitation type, snow amount, surface wind, cloud amount, ceiling height, and visibility, bias by category refers to the number of forecasts of a particular category (event) divided by the number of observations of that category. A value of 1.00 denotes unbiased forecasts for a particular category.

[2]The POD is the ratio of the number of times a particular category was correctly forecast to the total number of observations of that category.

[3]The FAR is the ratio of the number of times a particular category was incorrectly forecast to the total number of forecasts of that category.

[4]The skill score used throughout this report is the Heidke skill score (Panofsky and Brier, 1965).

Bulletin No. 318. Objective snow amount guidance is not produced for stations in the NWS Alaska Region.

Verification scores were computed for both local and guidance forecasts for 82 of the 86 conterminous U.S. stations listed in Table 3.1. The local and guidance forecasts were verified for the 12 - 24 h period from both 0000 and 1200 UTC, since the guidance was provided only for this projection.

We constructed forecast-observed contingency tables for four categories of snow amount. These tables were used for computing the percent correct and the skill score. The bias by category, threat score,[5] POD, and FAR were calculated separately for the three cumulative categories of ≥ 2, ≥ 4, and ≥ 6 inches. Table 4.1 shows comparative verification scores for the snow amount forecasts for both cycles.

5. SURFACE WIND

The objective surface wind forecasts for the conterminous U.S. were generated by the cool season, LFM-based equations described in Technical Procedures Bulletin No. 347 (National Weather Service, 1984b). For the NWS Alaska Region, the objective forecasts were generated by the equations described in Technical Procedures Bulletin No. 329 (National Weather Service, 1983b). The objective surface wind forecast is defined in the same way as the observed wind, namely, the 1-min average wind direction and speed for a specific time. All objective forecasts of wind speed were adjusted by an "inflation" technique (Klein et al., 1959) involving the multiple correlation coefficient and the mean value of wind speed for each station and forecast valid time.

We verified both the local and guidance forecasts for three projections; however, due to the change in issuance time of the FT's, the projections no longer match. The objective forecasts are valid at 12, 18, and 24 hours after both 0000 and 1200 UTC, while the local forecasts correspond to approximately 3-, 9-, and 15-h projections from the FT issuance times of approximately 0900 and 1800 UTC.

Although the MOS and local forecasts were verified separately, we used the same method of verification as in previous seasons. First, for those cases in which the wind speed forecasts were ≥ 10 kt, the mean absolute error and the mean algebraic error (forecast minus observed wind speed) of the forecasts were computed. Cases where the observed wind was calm were then eliminated from this sample and the MAE of direction was computed. Second, for all cases where the forecasts were available, the skill score, percent correct, bias by category, and threat score were computed from contingency tables of wind speed. The definitions of the categories used in the contingency tables are given in Table 5.1. The threat score used here was calculated by combining events of the upper two categories (winds ≥ 28 kt). In addition, for all cases in which the wind speed forecasts were at least 10 kt, the skill score for the wind direction forecasts was computed from contingency tables (see Table 5.1 for wind direction categories). The 98 stations used in the verification are listed in Table 2.1.

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[5]Threat score = H/(F+O-H), where H is the number of correct forecasts of a category, and F and O are the number of forecasts and observations of that category, respectively.

For the guidance, the results for all 92 conterminous U.S. stations combined are presented in Tables 5.2 and 5.7 for 0000 and 1200 UTC, respectively. Tables 5.3 - 5.6 and 5.8 - 5.11 show guidance scores for the NWS Eastern, Southern, Central, and Western Regions for 0000 and 1200 UTC, respectively. Similarly, Tables 5.12 and 5.13 show guidance scores for the NWS Alaska Region for 0000 and 1200 UTC, respectively. For the local forecasts, Table 5.14 (5.19) shows the results for all 91 (92) conterminous U.S. stations combined for the FT issuance time of approximately 0900 (1800) UTC. Local forecast results for the NWS Eastern, Southern, Central, and Western Regions are presented in Tables 5.15 - 5.18 and 5.20 - 5.23, respectively, for the two issuance times. Tables 5.24 and 5.25 show the NWS Alaska Region local scores for the same two approximate issuance times.

In addition, 42-h forecasts of winds $\geq$ 23 kt were collected as part of the AFOS-era verification system. Note that the change in FT issuance time did not affect these forecasts; hence, a comparative verification of the local and guidance forecasts was possible. Both the local and guidance forecasts correspond to the 42-h projection from 0000 and 1200 UTC. Since these forecasts specify the occurrence (or non-occurrence) of an operationally significant wind, they were verified against the highest observed sustained wind within $\pm$ 3 hours of the forecast valid time. For purposes of comparison, and analogous to the development of the MOS prediction equations, another set of scores was calculated by using the 1-min average wind observed at the exact forecast valid time. The results for all 92 conterminous U.S. stations combined are given in Tables 5.26 and 5.27 for 0000 and 1200 UTC, respectively. Similarly, Tables 5.28 and 5.29 show the results for the NWS Alaska Region for 0000 and 1200 UTC, respectively.

6. CLOUD AMOUNT

Throughout the 1988-89 cool season, the objective cloud amount forecasts for the conterminous U.S. were produced by the prediction equations described in Technical Procedures Bulletin No. 378 (National Weather Service, 1988). The forecast equations used LFM model output and 0000 (1200) UTC surface observations to produce probability forecasts of the four categories of cloud amount shown in Table 6.1. We converted the probability estimates to "best category" forecasts by an algorithm that produced good bias characteristics (bias of approximately 1.0 for each category) on the developmental sample. The algorithm used to obtain the best category for the new prediction equations is described in Technical Procedures Bulletin No. 378. For the NWS Alaska Region, similar objective cloud amount forecasts were produced by the prediction equations described in Technical Procedures Bulletin No. 329 (National Weather Service, 1983b).

We compared the local forecasts with a matched sample of guidance forecasts for the 100 stations listed in Table 2.1 for the 12-, 18-, and 24-h projections from 0000 and 1200 UTC. The surface observations used for verification were converted to the cloud amount categories given in Table 6.1. Four-category (clear, scattered, broken, and overcast), forecast-observed contingency tables were prepared from the local and objective categorical predictions. Using these tables, we computed the percent correct, skill score, and bias by category. Prior to the 1983-84 cool season, opaque sky cover amounts from surface observations were used in determining the observed categories. However, the hourly surface reports from which the verifying observations are now taken do not record total opaque sky cover as part of the observation; hence, thin clouds are also included. For example, a report of overcast with eight tenths opaque and two tenths thin, which previously was put into the broken category, now is categorized as overcast. The

result of this change is to decrease (increase) the number of observations of the broken (overcast) category compared to previous verifications. At the same time, the number of observations of clear (scattered) has increased (decreased) because reports of thin scattered, thin broken, and thin overcast clouds are all categorized as clear. These changes have greatly affected the overall bias by category statistics for both the guidance and local forecasts.

The results for all conterminous U.S. stations combined are shown in Tables 6.2 and 6.7 for the 0000 and 1200 UTC cycle forecasts, respectively. Tables 6.3 - 6.6 and Tables 6.8 - 6.11 show scores for the NWS Eastern, Southern, Central, and Western Regions, for the 0000 and 1200 UTC cycles, respectively. Tables 6.12 and 6.13 show results for the NWS Alaska Region for 0000 and 1200 UTC, respectively.

7. CEILING AND VISIBILITY

During the 1988-89 cool season, the ceiling and visibility guidance for the conterminous U.S. was produced by the prediction equations described in Technical Procedures Bulletin No. 303 (National Weather Service, 1981). For the NWS Alaska Region, the guidance was produced by the prediction equations described in Technical Procedures Bulletin No. 338 (National Weather Service, 1984a). Operationally, the guidance was based primarily on LFM model output and either 0100 or 0200 (1300 or 1400) UTC surface observations.

Verification scores were computed separately for the local and guidance forecasts. A comparative verification of local forecasts and persistence observations was performed for 91 (92) of the conterminous U.S. stations listed in Table 2.1 for the FT issuance time of approximately 0900 (1800) UTC. For the 6 stations in the NWS Alaska Region, persistence observations were not available for the entire cool season; thus, only local statistics were computed. The local forecasts and verifying observations correspond to approximately 3-, 6-, 9-, and 15-h projections from the beginning of the scheduled FT valid period. Persistence is also based on the local time, and the projections are from the beginning of the scheduled FT valid period.

A comparative verification of guidance forecasts and persistence observations was performed for the same 91 (92) conterminous U.S. and 6 NWS Alaska Region stations for the 0000 (1200) UTC cycle. Here, persistence for the 0000 (1200) UTC forecast cycle was based on an observation taken at the subsequent 0900 (2100) UTC. The objective and persistence forecasts were verified for the 12-, 18-, and 24-h projections from both cycles. Note that the persistence forecasts for the 12-, 18-, and 24-h projections are actually 3-, 9-, and 15-h forecasts, respectively, from the latest available surface observation.

We constructed forecast-observed contingency tables for the four categories of ceiling and visibility given in Table 7.1. These categories were used for computing several different scores: bias by category, percent correct, skill score, and log score.[6] Table 7.2 (7.3) shows the MOS ceiling height verification results for all 91 (92) conterminous U.S. stations combined for the 0000 (1200) UTC cycle. Table 7.4 (7.5) shows the MOS ceiling height results for the 6 NWS Alaska

[6]The log score is proportional to the absolute value of $\log_{10} f_i - \log_{10} O_i$, where f_i is the forecast category for each case and O_i is the observed category for each case. The result is averaged over all cases and scaled by multiplying by 50.

Region stations for the 0000 (1200) UTC cycle. Table 7.6 (7.7) presents the local ceiling height scores for the same 91 (92) conterminous U.S. stations except for the FT issuance time of approximately 0900 (1800) UTC, and Table 7.8 (7.9) shows the analogous results for the 6 NWS Alaska Region stations. Visibility scores for the MOS forecasts are given in Table 7.10 (7.11) for the 0000 (1200) UTC cycle for all 91 (92) conterminous U.S. stations combined. Table 7.12 (7.13) shows the MOS visibility results for the 6 NWS Alaska Region stations for the 0000 (1200) UTC cycle. Similarly, results for the local visibility forecasts are given in Tables 7.14 - 7.17 for the FT issuance times of approximately 0900 and 1800 UTC, and for the conterminous U.S. and NWS Alaska Region stations.

8. MAXIMUM/MINIMUM TEMPERATURE

Throughout the 1988-89 cool season, the max/min temperature guidance for the conterminous U.S. was generated by the prediction equations described in Technical Procedures Bulletin No. 356 (National Weather Service, 1985). These equations forecast daytime max and nighttime min temperatures. During the cool season, daytime is defined as 9 a.m. to 7 p.m. Local Standard Time (LST), while nighttime extends from 7 p.m. to 9 a.m. LST. The guidance equations were developed by stratifying archived LFM model forecasts, station observations, and the first two harmonics of the day of the year into seasons of 3-mo duration (Erickson and Dallavalle, 1986). The fall season is defined as September - November; the winter, as December - February; and the spring, as March - May. During the 0000 UTC cycle, the MOS max/min guidance is valid for periods corresponding to today's max, tonight's min, tomorrow's max, and tomorrow night's min. Similarly, for the 1200 UTC forecast cycle, guidance is produced for tonight's min, tomorrow's max, tomorrow night's min, and the day after tomorrow's max. Station observations at 0000 UTC (1200 UTC) are used as possible predictors only in the first period forecast of today's max (tonight's min). The valid periods of the guidance closely approximate those of the local forecaster who makes predictions of today's high, tonight's low, and so forth.

For the NWS Alaska Region, the max/min temperature guidance was generated by the prediction equations described in Technical Procedures Bulletin No. 329 (National Weather Service, 1983b). These equations forecast the max/min temperature for a calendar day period defined as midnight to midnight local time. These guidance forecasts correspond to the max/min temperature that normally occurs at projections of approximately 24, 36, 48, and 60 hours after 0000 and 1200 UTC. The fall season is defined as September - October; the winter, as November - March; and the spring, as April - May.

In this publication, we present results for both guidance and local forecasts that were verified by using observations approximating the daytime high or nighttime low. In the local AFOS-era verification software (Ruth and Alex, 1987) used in the conterminous U.S., daytime is defined as 7 a.m to 7 p.m. LST and nighttime as 7 p.m. to 8 a.m LST. The local program scans the synoptic and hourly reports to determine if the max/min observation adequately represents the daytime or nighttime period. If this observation is satisfactory, it is kept. If, however, the reported value is not representative of the day or night period, then an algorithm is used to deduce an appropriate value from available synoptic and hourly temperature observations. The local forecaster is also provided the option of replacing the estimated observation with the exact nighttime low or daytime high. For the NWS Alaska Region, both the local forecast and the observed max/min temperature are valid for 12-h periods ending at 30, 42, 54, and 66 hours after 0000 and 1200 UTC. It's important to note, then, that the verifi-

cation observations used in this report correspond reasonably well to the local and guidance forecast periods in the conterminous U.S. and to the local forecast periods in the NWS Alaska Region.

We verified the local and MOS max/min temperature forecasts for both the 0000 and 1200 UTC cycles. The mean algebraic error (forecast minus observed temperature), mean absolute error, percent of absolute errors > 10°F, probability of detection[7] of min temperatures ≤ 32°F, false alarm ratio[8] for min temperatures ≤ 32°F, and percent improvement over climate[9] were computed for 99 stations in the conterminous United States and the Alaska Region (see Table 2.1). For the conterminous U.S. stations, the local and guidance max temperature forecasts at 0000 (1200) UTC are valid for daytime periods ending approximately 24 (36) and 48 (60) hours after 0000 (1200) UTC. Similarly, at 0000 (1200) UTC, the local and guidance min temperature forecasts are valid for nighttime periods ending about 36 (24) and 60 (48) hours after 0000 (1200) UTC. For the NWS Alaska Region, the guidance forecasts are calendar day max/min forecasts.

For all conterminous U.S. stations combined, the results for 0000 and 1200 UTC are shown in Tables 8.1 and 8.6, respectively. Similarly, Tables 8.2 - 8.5 give the 0000 UTC verification scores for the NWS Eastern, Southern, Central, and Western Regions, respectively. Tables 8.7 - 8.10 show scores by NWS region for the 1200 UTC cycle. Finally, Tables 8.11 and 8.12 show verification scores for the NWS Alaska Region for the 0000 and 1200 UTC cycles, respectively.

REFERENCES

Bocchieri, J. R., 1983: Automated guidance for forecasting snow amount. Mon. Wea. Rev., 111, 2097-2109.

_____, J. R., and G. J. Maglaras, 1983: An improved operational system for forecasting precipitation type. Mon. Wea. Rev., 111, 405-419.

Brier, G. W., 1950: Verification of forecasts expressed in terms of probability. Mon. Wea. Rev., 78, 1-3.

Carter, G. M., J. P. Dallavalle, G. W. Hollenbaugh, G. J. Maglaras, and B. E. Schwartz, 1983: Comparative verification of guidance and local aviation/public weather forecasts--No. 15 (October 1982-March 1983). TDL Office Note 83-16, National Weather Service, NOAA, U.S. Department of Commerce, 76 pp.

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[7]Here, the probability of detection is defined to be the fraction of time the min temperature was correctly forecast to be ≤ 32°F when the previous day's min was ≥ 40°F.

[8]Here, the false alarm ratio is defined to be the fraction of forecasts of ≤ 32°F that failed to verify when the previous day's min was ≥ 40°F.

[9]The percent improvement over climate is the percent improvement of mean square errors obtained from the local or guidance forecasts over analogous mean square errors produced by climatic forecasts. The climatic values used here are the National Climatic Data Center's daily normal max or min temperatures for each station determined from a 30-yr sample.

Dagostaro, V. J., 1985: The national AFOS-era verification data processing system. TDL Office Note 85-9, National Weather Service, NOAA, U.S. Department of Commerce, 47 pp.

Erickson, M. C., and J. P. Dallavalle, 1986: Objectively forecasting the short-range maximum/minimum temperature - A new look. Preprints Eleventh Conference on Weather Forecasting and Analysis, Kansas City, Amer. Meteor. Soc., 33-38.

Gerrity, J. P., Jr., 1977: The LFM model--1976: A documentation. NOAA Technical Memorandum NWS NMC-60, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 68 pp.

Glahn, H. R., and D. A. Lowry, 1972: The use of Model Output Statistics (MOS) in objective weather forecasting. J. Appl. Meteor., 11, 1203-1211.

Jorgensen, D. L., 1967: Climatological probabilities of precipitation for the conterminous United States. ESSA Tech. Report WB-5, Environmental Science Services Administration, U.S. Department of Commerce, 60 pp.

Klein, W. H., B. M. Lewis, and I. Enger, 1959: Objective prediction of five-day mean temperatures during winter. J. Meteor., 16, 672-682.

National Weather Service, 1980: The use of Model Output Statistics for predicting probability of precipitation. NWS Technical Procedures Bulletin No. 289, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 13 pp.

_____, 1981: The use of Model Output Statistics for predicting ceiling, visibility, cloud amount, and obstructions to vision. NWS Technical Procedures Bulletin No. 303, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 11 pp.

_____, 1982a: National Verification Plan. National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 81 pp.

_____, 1982b: The use of Model Output Statistics for predicting snow amount. NWS Technical Procedures Bulletin No. 318, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 14 pp.

_____, 1982c: Operational probability of precipitation type forecasts based on Model Output Statistics. NWS Technical Procedures Bulletin No. 319, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 14 pp.

_____, 1983a: Public/aviation forecast verification. NWS Operations Manual, Chapter C-73, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 18 pp.

_____, 1983b: Alaskan temperature, surface wind, probability of precipitation (PoP), conditional probability of frozen precipitation, and cloud amount guidance (FMAK1 bulletin). NWS Technical Procedures Bulletin No. 329, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 16 pp.

_____, 1984a: Alaskan ceiling height, visibility, and obstructions to vision guidance (FMAK2 bulletin). NWS Technical Procedures Bulletin No. 338, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 7 pp.

_____, 1984b: The use of Model Output Statistics for predicting surface wind. NWS Technical Procedures Bulletin No. 347, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 11 pp.

_____, 1985: Automated daytime maximum, nighttime minimum, 3-hourly surface temperature, and 3-hourly surface dew point guidance. NWS Technical Procedures Bulletin No. 356, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 14 pp.

_____, 1988: Updated LFM-based MOS cloud amount guidance. NWS Technical Procedures Bulletin No. 378, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 8 pp.

_____, 1990: LFM-based MOS forecasts of the probability of precipitation (PoP). NWS Technical Procedures Bulletin No. 386, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 12 pp.

Newell, J. E., and D. G. Deaven, 1981: The LFM-II model--1980. NOAA Technical Memorandum NWS NMC-66, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, 20 pp.

Panofsky, H. A., and G. W. Brier, 1965: Some Applications of Statistics to Meteorology. Pennsylvania State University, University Park, 224 pp.

Ruth, D. P., and C. L. Alex, 1987: AFOS-era forecast verification. NOAA Techniques Development Laboratory Computer Program NWS TDL CP 87-2, National Weather Service, NOAA, U.S. Department of Commerce, 50 pp.

Table 2.1. Ninety-four stations in the conterminous U.S. and 6 stations in the NWS Alaska Region used for comparative verification of MOS guidance and local max/min temperature, probability of precipitation, cloud amount, ceiling height, visibility, and surface wind forecasts. Please note that LAX was 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 during the 0000 UTC cycle for the local ceiling height, visibility, and surface wind verifications.

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	EWR	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
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	TUL	Tulsa, 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	YAK	Yakutat, Alaska
FAI	Fairbanks, Alaska	OME	Nome, Alaska
JNU	Juneau, Alaska	SIT	Sitka, Alaska

Table 2.2. Comparative verification of MOS and local PoP forecasts for 93 stations in the conterminous U.S., 0000 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
12-24	MOS	0.0876		42.0		0.2356		
(1st period)	LOCAL	0.0793	9.5	47.5	16109	0.1848	21.6	2004
24-36	MOS	0.0989		34.7		0.2353		
(2nd period)	LOCAL	0.0912	7.8	39.7	15968	0.1873	20.4	2104
36-48	MOS	0.1082		28.5		0.2430		
(3rd period)	LOCAL	0.1012	6.5	33.2	16089	0.2012	17.2	2210

Table 2.3. Same as Table 2.2 except for 24 stations in the Eastern Region.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
12-24	MOS	0.1055		45.1		0.2359		
(1st period)	LOCAL	0.0978	7.3	49.2	4188	0.1958	17.0	653
24-36	MOS	0.1124		38.4		0.2321		
(2nd period)	LOCAL	0.1068	5.0	41.5	4186	0.2009	13.4	678
36-48	MOS	0.1263		34.2		0.2371		
(3rd period)	LOCAL	0.1203	4.8	37.3	4185	0.2071	12.6	702

Table 2.4. Same as Table 2.2 except for 24 stations in the Southern Region.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
12-24	MOS	0.0728		42.3		0.2160		
(1st period)	LOCAL	0.0681	6.4	46.0	4157	0.1869	13.5	507
24-36	MOS	0.0846		33.7		0.2024		
(2nd period)	LOCAL	0.0791	6.4	38.0	4019	0.1695	16.2	516
36-48	MOS	0.0908		27.9		0.2192		
(3rd period)	LOCAL	0.0848	6.7	32.7	4151	0.1794	18.2	561

Table 2.5. Same as Table 2.2 except for 28 stations in the Central Region.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
12-24	MOS	0.0831		41.5		0.2535		
(1st period)	LOCAL	0.0716	13.8	49.5	4786	0.1739	31.4	551
24-36	MOS	0.1001		33.2		0.2557		
(2nd period)	LOCAL	0.0887	11.3	40.8	4784	0.1800	29.6	601
36-48	MOS	0.1052		26.0		0.2606		
(3rd period)	LOCAL	0.0964	8.4	32.2	4781	0.2063	20.8	611

Table 2.6. Same as Table 2.2 except for 17 stations in the Western Region.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
12-24	MOS	0.0901		36.5		0.2350		
(1st period)	LOCAL	0.0810	10.1	42.9	2978	0.1769	24.7	293
24-36	MOS	0.0973		31.6		0.2575		
(2nd period)	LOCAL	0.0896	7.9	37.0	2979	0.2012	21.8	309
36-48	MOS	0.1120		22.8		0.2633		
(3rd period)	LOCAL	0.1050	6.2	27.5	2972	0.2161	17.9	336

Table 2.7. Comparative verification of MOS and local PoP forecasts for 93 stations in the conterminous U.S., 1200 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
12-24	MOS	0.0909		39.9		0.2485		
(1st period)	LOCAL	0.0817	10.2	46.0	15963	0.1858	25.2	1969
24-36	MOS	0.0989		34.6		0.2479		
(2nd period)	LOCAL	0.0926	6.4	38.8	16082	0.2094	15.6	2072
36-48	MOS	0.1122		25.7		0.2342		
(3rd period)	LOCAL	0.1038	7.5	31.3	15950	0.1880	19.8	2342

Table 2.8. Same as Table 2.7 except for 24 stations in the Eastern Region.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
12-24	MOS	0.1059		42.0		0.2326		
(1st period)	LOCAL	0.0991	6.4	45.7	4182	0.1915	17.7	598
24-36	MOS	0.1169		39.1		0.2268		
(2nd period)	LOCAL	0.1137	2.7	40.7	4180	0.2171	4.3	619
36-48	MOS	0.1311		28.7		0.2313		
(3rd period)	LOCAL	0.1224	6.6	33.4	4181	0.1923	16.8	731

Table 2.9. Same as Table 2.7 except for 24 stations in the Southern Region.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
12-24	MOS	0.0791		37.8		0.2228		
(1st period)	LOCAL	0.0726	8.1	42.9	4022	0.1756	21.2	483
24-36	MOS	0.0863		31.2		0.2502		
(2nd period)	LOCAL	0.0785	9.0	37.4	4152	0.1994	20.3	512
36-48	MOS	0.0951		24.0		0.2044		
(3rd period)	LOCAL	0.0864	9.1	30.9	4019	0.1617	20.9	641

Table 2.10. Same as Table 2.7 except for 28 stations in the Central Region.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	% Imp. Over Guid.	No. of Changes
12-24	MOS	0.0887		41.0		0.2734		
(1st period)	LOCAL	0.0758	14.5	49.6	4795	0.1890	30.9	601
24-36	MOS	0.0936		34.6		0.2632		
(2nd period)	LOCAL	0.0859	8.2	39.9	4793	0.2110	19.8	622
36-48	MOS	0.1134		24.2		0.2588		
(3rd period)	LOCAL	0.1036	8.6	30.8	4791	0.1984	23.4	658

Table 2.11. Same as Table 2.7 except for 17 stations in the Western Region.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	% Imp. Over Guid.	No. of Changes
12-24	MOS	0.0895		36.7		0.2728		
(1st period)	LOCAL	0.0787	12.1	44.3	2964	0.1841	32.5	287
24-36	MOS	0.0996		30.5		0.2557		
(2nd period)	LOCAL	0.0931	6.5	35.0	2957	0.2073	19.0	319
36-48	MOS	0.1070		25.0		0.2508		
(3rd period)	LOCAL	0.1012	5.4	29.0	2959	0.2098	16.3	312

Table 2.12. Comparative verification of MOS and local PoP forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
6-18	MOS	0.1536		*		0.2437		
(1st period)	LOCAL	0.1401	8.8	*	839	0.2082	14.6	253
18-30	MOS	0.1524		*		0.2385		
(2nd period)	LOCAL	0.1487	2.4	*	858	0.2304	3.4	277
30-42	MOS	0.1598		*		0.2000		
(3rd period)	LOCAL	0.1617	-1.2	*	838	0.2040	-2.0	242

* Percent improvement over climate score is not available.

Table 2.13. Same as Table 2.12 except for the 1200 UTC cycle.

Forecast Projection (h)	Type of Forecast	Brier Score	% Imp. Over Guid.	% Imp. Over Clim.	No. of Cases	Changes GE 20% to Guidance: Brier Score	Changes GE 20% to Guidance: % Imp. Over Guid.	Changes GE 20% to Guidance: No. of Changes
6-18	MOS	0.1486		*		0.2239		
(1st period)	LOCAL	0.1278	14.0	*	843	0.1684	24.8	281
18-30	MOS	0.1512		*		0.2120		
(2nd period)	LOCAL	0.1509	0.1	*	824	0.2091	1.4	224
30-42	MOS	0.1536		*		0.2161		
(3rd period)	LOCAL	0.1521	1.0	*	839	0.2151	0.5	228

* Percent improvement over climate score is not available.

Table 3.1. Eighty-six stations in the conterminous U.S. used for comparative verification of LFM MOS guidance and local precipitation type forecasts.

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	EWR	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
LIT	Little Rock, Arkansas	FSM	Fort Smith, Arkansas
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	TUL	Tulsa, 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
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

Table 3.2. Comparative verification of MOS and local forecasts of PoPT for 86 stations in the conterminous U.S. for the 0000 UTC cycle. Only cases where the local PoP was $\geq$ 30% were included. Data for TCC were not available for the 30-h projection.

Projection (h)	Region Number of Stations	Type of Forecast	Bias ZR	Bias S	Bias R	Percent Correct	Skill Score	POD ZR	POD S	FAR ZR	FAR S
18	Eastern 24	MOS	0.51	0.94	1.07	88.2	0.758	0.18	0.83	0.65	0.12
		LOCAL	0.64	0.90	1.08	87.5	0.743	0.23	0.79	0.64	0.12
		No. Obs.	39	268	492						
	Southern 22	MOS	0.86	0.69	1.04	93.6	0.643	0.29	0.56	0.67	0.18
		LOCAL	0.43	0.53	1.06	92.7	0.546	0.14	0.47	0.67	0.12
		No. Obs.	7	32	305						
	Central 28	MOS	0.68	0.98	1.07	90.3	0.814	0.43	0.92	0.37	0.06
		LOCAL	0.79	0.96	1.08	88.5	0.782	0.39	0.90	0.50	0.07
		No. Obs.	28	330	218						
	Western 12	MOS	0.00	0.99	1.04	92.1	0.842	0.00	0.91	*	0.08
		LOCAL	0.40	0.91	1.10	90.9	0.820	0.00	0.86	1.00	0.05
		No. Obs.	5	164	183						
	All Stations	MOS	0.57	0.96	1.06	90.3	0.809	0.27	0.87	0.53	0.09
		LOCAL	0.66	0.91	1.08	89.2	0.786	0.27	0.84	0.60	0.08
		No. Obs.	79	794	1198						
30	Eastern 24	MOS	1.12	0.97	1.01	87.0	0.743	0.48	0.84	0.57	0.13
		LOCAL	0.81	1.04	1.00	86.3	0.728	0.33	0.85	0.59	0.18
		No. Obs.	42	234	452						
	Southern 21	MOS	1.38	0.21	1.05	90.6	0.429	0.54	0.18	0.61	0.17
		LOCAL	0.85	0.71	1.03	89.6	0.415	0.15	0.36	0.82	0.50
		No. Obs.	13	28	333						
	Central 28	MOS	1.39	0.90	1.08	85.0	0.729	0.48	0.84	0.65	0.06
		LOCAL	0.67	1.01	1.03	87.5	0.764	0.33	0.91	0.50	0.11
		No. Obs.	33	328	237						
	Western 12	MOS	**	0.95	1.04	91.0	0.819	**	0.88	1.00	0.07
		LOCAL	**	1.03	0.97	92.2	0.844	**	0.93	1.00	0.10
		No. Obs.	0	161	184						
	All Stations	MOS	1.27	0.91	1.04	87.7	0.761	0.49	0.83	0.62	0.09
		LOCAL	0.77	1.01	1.01	88.2	0.769	0.31	0.87	0.60	0.14
		No. Obs.	88	751	1206						
42	Eastern 24	MOS	1.45	0.88	1.03	84.8	0.704	0.50	0.78	0.65	0.12
		LOCAL	0.55	0.91	1.09	84.5	0.683	0.11	0.78	0.81	0.14
		No. Obs.	38	274	479						
	Southern 22	MOS	1.00	0.69	1.03	94.3	0.669	0.00	0.66	1.00	0.05
		LOCAL	0.40	0.66	1.05	93.6	0.607	0.20	0.55	0.50	0.16
		No. Obs.	5	29	280						
	Central 28	MOS	1.69	0.90	1.08	84.0	0.700	0.42	0.84	0.75	0.07
		LOCAL	0.73	0.95	1.13	85.1	0.709	0.27	0.87	0.63	0.08
		No. Obs.	26	339	191						
	Western 12	MOS	0.50	0.98	1.03	87.8	0.760	0.00	0.87	1.00	0.11
		LOCAL	0.25	0.94	1.07	90.5	0.812	0.00	0.88	1.00	0.07
		No. Obs.	4	160	173						
	All Stations	MOS	1.45	0.90	1.04	86.6	0.744	0.41	0.82	0.72	0.09
		LOCAL	0.59	0.93	1.08	87.1	0.746	0.16	0.83	0.72	0.10
		No. Obs.	73	802	1123						

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

Table 3.3. Same as Table 3.2 except for the 1200 UTC cycle. Data for TCC were not available for the 18- and 42-h projections.

Projection (h)	Region Number of Stations	Type of Forecast	Bias ZR	Bias S	Bias R	Percent Correct	Skill Score	POD ZR	POD S	FAR ZR	FAR S
18	Eastern 24	MOS	0.91	1.05	0.98	88.7	0.776	0.38	0.90	0.58	0.14
		LOCAL	0.85	1.05	0.98	89.8	0.797	0.41	0.91	0.52	0.14
		No. Obs.	34	239	455						
	Southern 21	MOS	1.55	0.44	1.04	91.2	0.520	0.45	0.34	0.71	0.21
		LOCAL	1.00	0.81	1.02	91.2	0.549	0.36	0.53	0.64	0.35
		No. Obs.	11	32	331						
	Central 28	MOS	1.39	0.91	1.08	85.9	0.744	0.48	0.85	0.65	0.06
		LOCAL	1.13	0.94	1.07	85.0	0.725	0.45	0.84	0.60	0.10
		No. Obs.	31	329	235						
	Western 12	MOS	**	0.94	1.04	92.7	0.853	**	0.89	1.00	0.05
		LOCAL	***	0.97	1.02	93.6	0.871	***	0.92	***	0.06
		No. Obs.	0	157	186						
	All Stations	MOS	1.22	0.94	1.02	89.0	0.785	0.43	0.85	0.65	0.09
		LOCAL	0.99	0.98	1.02	89.3	0.790	0.42	0.87	0.57	0.11
		No. Obs.	76	757	1207						
30	Eastern 24	MOS	0.92	0.92	1.05	86.0	0.718	0.32	0.80	0.66	0.13
		LOCAL	0.61	0.94	1.06	87.7	0.748	0.29	0.81	0.52	0.14
		No. Obs.	38	259	484						
	Southern 22	MOS	1.57	0.67	1.02	92.6	0.639	0.14	0.61	0.91	0.09
		LOCAL	1.00	0.55	1.05	93.2	0.633	0.00	0.55	1.00	0.00
		No. Obs.	7	33	285						
	Central 28	MOS	1.84	0.93	1.02	84.0	0.699	0.44	0.87	0.76	0.06
		LOCAL	0.64	0.99	1.07	86.3	0.730	0.24	0.90	0.63	0.09
		No. Obs.	25	341	197						
	Western 12	MOS	0.00	0.97	1.06	92.4	0.849	0.00	0.91	*	0.06
		LOCAL	0.20	0.97	1.05	90.3	0.809	0.00	0.89	1.00	0.08
		No. Obs.	5	163	172						
	All Stations	MOS	1.23	0.92	1.04	87.6	0.762	0.32	0.84	0.74	0.09
		LOCAL	0.63	0.95	1.06	88.7	0.778	0.23	0.85	0.64	0.10
		No. Obs.	75	796	1138						
42	Eastern 24	MOS	1.26	0.98	0.98	84.8	0.703	0.43	0.82	0.66	0.16
		LOCAL	0.57	1.09	0.99	82.3	0.647	0.12	0.82	0.79	0.25
		No. Obs.	42	233	453						
	Southern 21	MOS	1.58	0.18	1.04	88.0	0.238	0.17	0.18	0.89	0.00
		LOCAL	0.42	0.59	1.05	91.5	0.410	0.17	0.36	0.60	0.38
		No. Obs.	12	22	307						
	Central 28	MOS	2.27	0.89	0.97	80.5	0.656	0.52	0.83	0.77	0.08
		LOCAL	0.64	1.03	1.00	83.2	0.676	0.21	0.90	0.67	0.13
		No. Obs.	33	327	205						
	Western 12	MOS	0.00	0.96	1.04	89.4	0.786	0.00	0.87	*	0.10
		LOCAL	0.00	1.04	0.97	88.8	0.775	0.00	0.90	*	0.13
		No. Obs.	1	152	176						
	All Stations	MOS	1.67	0.91	1.00	84.9	0.714	0.42	0.81	0.75	0.11
		LOCAL	0.57	1.04	1.01	85.2	0.712	0.16	0.86	0.72	0.18
		No. Obs.	88	734	1141						

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

Table 4.1. Comparative verification of MOS and local snow amount forecasts for 82 stations in the conterminous U.S. for the 12-24 h projection.

Cycle (UTC)	Type of Forecast	Bias ≥2	Bias ≥4	Bias ≥6	Percent Correct	Skill Score	Threat Score ≥2	Threat Score ≥4	Threat Score ≥6	POD ≥2	POD ≥4	POD ≥6	FAR ≥2	FAR ≥4	FAR ≥6
0000	MOS	1.05	1.50	0.60	97.9	0.263	0.209	0.149	0.000	0.35	0.32	0.00	0.66	0.78	1.00
	LOCAL	1.16	1.38	0.87	97.9	0.298	0.233	0.188	0.037	0.41	0.38	0.07	0.65	0.73	0.92
	No. Obs.	189	40	15											
1200	MOS	0.94	0.85	0.38	98.0	0.197	0.162	0.063	0.059	0.27	0.11	0.08	0.71	0.87	0.80
	LOCAL	1.44	1.09	0.77	97.8	0.295	0.228	0.116	0.000	0.45	0.22	0.00	0.69	0.80	1.00
	No. Obs.	174	46	13											

Table 5.1. Definition of the categories used for MOS guidance, local forecasts, and surface observations of wind direction and speed.

Category	Direction (degrees)	Speed (kt)
1	340 - 20	≤ 12
2	30 - 60	13 - 17
3	70 - 110	18 - 22
4	120 - 150	23 - 27
5	160 - 200	28 - 32
6	210 - 240	≥ 33
7	250 - 290	---
8	300 - 330	---

Table 5.2. Verification of MOS surface wind guidance for 92 stations in the conterminous U.S., 0000 UTC cycle.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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	MOS	22	0.538	3757	3.3	1.0	3789	0.397	86.4	0.08	1.03 13134	0.84 1555	0.78 407	0.79 110	0.68 19	0.00 8
18	MOS	24	0.492	6701	3.3	0.1	6730	0.368	74.0	0.08	1.10 11046	0.82 3185	0.64 1025	0.64 249	0.36 55	0.42 12
24	MOS	27	0.460	4961	3.5	0.8	4983	0.344	81.4	0.02	1.05 12795	0.85 2095	0.67 583	0.55 122	0.25 32	0.17 6

Table 5.3. Same as Table 5.2 except for 24 stations in the Eastern Region.

Fcst Proj (h)	Type of Fcst.	Direction			Speed										
								Contingency Table							
											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	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	MOS	21	0.496	1070	3.1	0.8	1076	0.374	85.3	0.00	1.04 3493	0.80 476	0.56 115	1.06 17	2.00 1	0.00 2
18	MOS	23	0.450	2065	3.0	-0.1	2074	0.342	71.3	0.10	1.14 2773	0.76 1038	0.63 256	0.56 50	0.29 7	0.00 2
24	MOS	26	0.440	1190	3.3	0.7	1192	0.356	83.5	0.00	1.06 3449	0.76 549	0.66 122	0.21 24	0.20 5	* 0

* This category was neither forecast nor observed.

Table 5.4. Same as Table 5.2 except for 22 stations in the Southern Region.

Fcst Proj (h)	Type of Fcst.	Direction			Speed										
								Contingency Table							
											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	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	MOS	24	0.540	661	3.4	1.7	669	0.396	90.7	0.00	1.00 3161	0.96 230	0.78 55	2.20 5	1.50 2	* 0
18	MOS	26	0.485	1468	3.3	0.9	1474	0.362	76.9	0.00	1.05 2758	0.88 661	0.76 160	0.69 39	1.00 4	** 0
24	MOS	28	0.457	1008	3.4	1.4	1016	0.308	85.1	0.33	1.01 3176	0.97 368	0.68 73	0.57 14	0.50 2	** 0

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

Table 5.5. Same as Table 5.2 except for 28 stations in the Central Region.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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	MOS	19	0.574	1512	3.3	0.8	1521	0.402	81.7	0.11	1.04 3780	0.83 662	0.98 163	0.75 60	0.55 11	0.00 4
18	MOS	20	0.543	2436	3.3	-0.4	2440	0.355	67.4	0.05	1.16 2871	0.83 1212	0.59 483	0.66 113	0.24 29	0.50 4
24	MOS	24	0.517	1724	3.4	0.3	1727	0.346	77.9	0.00	1.08 3647	0.81 761	0.62 254	0.55 53	0.36 11	0.00 3

Table 5.6. Same as Table 5.2 except for 18 stations in the Western Region.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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	MOS	31	0.416	514	3.9	1.1	523	0.382	90.0	0.13	1.03 2700	0.83 187	0.68 74	0.46 28	0.40 5	0.00 2
18	MOS	39	0.370	732	4.5	1.2	742	0.369	84.4	0.15	1.03 2644	0.95 274	0.70 126	0.62 47	0.47 15	0.33 6
24	MOS	35	0.333	1039	3.9	1.3	1048	0.344	79.8	0.00	1.03 2523	0.94 417	0.78 134	0.81 31	0.14 14	0.00 3

Table 5.7. Verification of MOS surface wind guidance for 92 stations, 1200 UTC cycle.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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	MOS	25	0.489	5231	3.3	0.9	5262	0.371	81.8	0.06	1.03 12757	0.89 2080	0.72 584	0.76 123	0.41 32	0.17 6
18	MOS	25	0.481	3891	3.5	0.9	3916	0.369	85.2	0.03	1.03 13177	0.85 1655	0.73 451	0.50 116	0.31 29	0.00 1
24	MOS	27	0.483	3563	3.7	1.1	3601	0.351	85.6	0.06	1.04 13059	0.79 1573	0.81 404	0.47 110	0.42 19	0.00 7

Table 5.8. Same as Table 5.7 except for 24 stations in the Eastern Region.

Fcst Proj (h)	Type of Fcst.	Direction			Speed										
								Contingency Table							
											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	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	MOS	24	0.478	1245	3.1	0.7	1247	0.379	83.8	0.00	1.05 3444	0.82 544	0.62 122	0.65 23	0.00 5	* 0
18	MOS	23	0.460	1101	3.3	0.8	1107	0.371	84.6	0.00	1.03 3509	0.88 473	0.77 114	0.42 31	0.00 5	* 0
24	MOS	24	0.466	1006	3.2	0.9	1013	0.366	85.7	0.00	1.05 3476	0.70 482	0.63 108	0.76 17	1.00 1	0.00 1

* This category was neither forecast nor observed.

Table 5.9. Same as Table 5.7 except for 22 stations in the Southern Region.

Fcst Proj (h)	Type of Fcst.	Direction			Speed										
								Contingency Table							
											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	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	MOS	28	0.451	1030	3.3	1.5	1043	0.365	85.9	0.33	1.01 3176	0.96 367	0.95 75	1.07 14	1.00 2	* 0
18	MOS	28	0.480	792	3.8	1.8	799	0.324	87.0	0.00	1.01 3086	0.98 283	0.97 69	0.61 18	0.33 3	* 0
24	MOS	29	0.474	712	3.8	2.2	721	0.312	88.7	0.00	1.00 3150	1.05 239	0.84 57	1.60 5	0.50 2	* 0

* This category was neither forecast nor observed.

Table 5.10. Same as Table 5.7 except for 28 stations in the Central Region.

Fcst Proj (h)	Type of Fcst.	Direction: Mean Abs. Error (deg)	Direction: Skill Score	Direction: No. of Cases	Speed: Mean Abs. Error (kt)	Speed: Mean Alg. Error (kt)	Speed: No. of Cases	Contingency Table: Skill Score	Contingency Table: Percent Fcst. Correct	Contingency Table: Threat Score (>27 kt)	Bias by Category: 1 No. Obs	2 No. Obs	3 No. Obs	4 No. Obs	5 No. Obs	6 No. Obs
12	MOS	20	0.556	1863	3.2	0.3	1867	0.360	77.8	0.00	1.06 3635	0.87 756	0.69 252	0.64 55	0.36 11	0.00 3
18	MOS	22	0.502	1440	3.3	0.5	1446	0.365	81.4	0.06	1.06 3806	0.76 680	0.66 191	0.67 36	0.46 13	* 0
24	MOS	23	0.500	1376	3.7	0.9	1388	0.348	80.6	0.06	1.06 3751	0.74 668	1.01 165	0.44 59	0.36 11	0.00 4

* This category was neither forecast nor observed.

Table 5.11. Same as Table 5.7 except for 18 stations in the Western Region.

Fcst Proj (h)	Type of Fcst.	Direction: Mean Abs. Error (deg)	Direction: Skill Score	Direction: No. of Cases	Speed: Mean Abs. Error (kt)	Speed: Mean Alg. Error (kt)	Speed: No. of Cases	Contingency Table: Skill Score	Contingency Table: Percent Fcst. Correct	Contingency Table: Threat Score (>27 kt)	Bias by Category: 1 No. Obs	2 No. Obs	3 No. Obs	4 No. Obs	5 No. Obs	6 No. Obs
12	MOS	33	0.369	1093	3.7	1.3	1105	0.371	80.3	0.09	1.03 2502	0.96 413	0.73 135	0.94 31	0.50 14	0.33 3
18	MOS	35	0.366	558	4.2	0.9	564	0.406	89.6	0.00	1.03 2776	0.89 219	0.58 77	0.32 31	0.25 8	0.00 1
24	MOS	39	0.369	469	4.4	0.8	479	0.340	89.7	0.13	1.03 2682	0.83 184	0.59 74	0.17 29	0.40 5	0.00 2

Table 5.12. Verification of MOS surface wind guidance for 6 stations in the Alaska Region, 0000 UTC cycle.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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	MOS	31	0.407	263	4.5	2.4	267	0.411	85.2	0.00	0.99 892	1.03 92	1.26 31	0.69 13	0.80 5	*** 0
18	MOS	34	0.376	275	5.0	3.1	291	0.330	81.7	0.00	1.00 880	0.96 116	0.97 30	1.07 14	4.00 1	*** 0
24	MOS	36	0.323	321	5.1	3.0	328	0.337	80.4	0.00	0.98 879	1.09 112	1.00 42	1.27 11	1.00 2	6.00 1

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

Table 5.13. Same as Table 5.12 except for the 1200 UTC cycle.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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	MOS	34	0.369	294	4.2	2.0	298	0.375	82.2	0.00	0.99 865	1.10 109	0.93 41	0.82 11	1.00 2	1.00 1
18	MOS	34	0.397	261	4.8	2.8	270	0.359	84.8	0.17	0.98 905	1.38 72	0.77 39	1.40 10	2.00 1	0.33 3
24	MOS	36	0.382	259	5.4	3.3	268	0.307	82.1	0.00	0.98 880	1.09 91	1.34 29	0.92 12	1.60 5	* 0

* This category was neither forecast nor observed.

Table 5.14. Verification of local surface wind forecasts for 91 stations in the conterminous U.S. for the FT issuance time of approximately 0900 UTC.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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
3	LOCAL	23	0.528	6543	3.4	2.0	6625	0.431	85.1	0.21	0.97 13591	1.29 1581	0.92 448	0.70 104	0.50 22	0.14 7
9	LOCAL	31	0.406	10393	3.5	1.2	10481	0.347	70.3	0.11	0.99 11075	1.20 3291	0.69 1045	0.38 259	0.29 59	0.31 13
15	LOCAL	35	0.357	9308	4.1	2.7	9473	0.293	74.7	0.08	0.91 12909	1.54 2147	1.03 565	0.59 114	0.54 24	0.00 3

Table 5.15. Same as Table 5.14 except for 24 stations in the Eastern Region.

Fcst Proj (h)	Type of Fcst.	Direction: Mean Abs. Error (deg)	Direction: Skill Score	Direction: No. of Cases	Speed: Mean Abs. Error (kt)	Speed: Mean Alg. Error (kt)	Speed: No. of Cases	Contingency Table: Skill Score	Contingency Table: Percent Fcst. Correct	Contingency Table: Threat Score (>27 kt)	Bias by Category: 1 No. Obs	2 No. Obs	3 No. Obs	4 No. Obs	5 No. Obs	6 No. Obs
3	LOCAL	23	0.476	2057	3.4	2.1	2088	0.420	83.6	0.00	0.97 3572	1.24 496	0.80 123	1.38 16	1.00 1	0.00 2
9	LOCAL	29	0.404	3075	3.2	0.9	3093	0.304	67.3	0.00	1.02 2826	1.06 1065	0.62 267	0.47 49	0.25 8	0.00 2
15	LOCAL	35	0.318	2548	4.1	2.8	2594	0.280	75.3	0.00	0.92 3492	1.51 567	1.08 125	0.80 25	0.40 5	* 0

* This category was neither forecast nor observed.

Table 5.16. Same as Table 5.14 except for 21 stations in the Southern Region.

Fcst Proj (h)	Type of Fcst.	Direction: Mean Abs. Error (deg)	Direction: Skill Score	Direction: No. of Cases	Speed: Mean Abs. Error (kt)	Speed: Mean Alg. Error (kt)	Speed: No. of Cases	Contingency Table: Skill Score	Contingency Table: Percent Fcst. Correct	Contingency Table: Threat Score (>27 kt)	Bias by Category: 1 No. Obs	2 No. Obs	3 No. Obs	4 No. Obs	5 No. Obs	6 No. Obs
3	LOCAL	23	0.563	1230	3.3	2.2	1243	0.379	89.2	0.33	0.97 3373	1.42 239	0.83 54	0.71 7	1.00 2	* 0
9	LOCAL	31	0.397	2374	3.3	1.4	2389	0.334	74.6	0.00	0.98 2819	1.27 657	0.48 151	0.10 39	0.00 4	0.00 1
15	LOCAL	34	0.361	2129	4.1	3.1	2172	0.267	78.6	0.00	0.91 3194	1.74 398	1.04 68	0.60 10	0.50 2	* 0

* This category was neither forecast nor observed.

Table 5.17. Same as Table 5.14 except for 28 stations in the Central Region.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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
3	LOCAL	21	0.563	2484	3.4	1.9	2510	0.442	80.4	0.18	0.95 3888	1.32 666	1.08 183	0.54 59	0.55 11	0.00 3
9	LOCAL	29	0.435	3624	3.5	1.0	3649	0.341	63.2	0.07	0.94 2918	1.31 1241	0.77 485	0.47 116	0.24 34	0.67 3
15	LOCAL	33	0.383	3263	3.9	2.3	3301	0.291	68.3	0.06	0.86 3667	1.65 819	1.03 253	0.56 52	0.45 11	0.00 2

Table 5.18. Same as Table 5.14 except for 18 stations in the Western Region.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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
3	LOCAL	32	0.417	772	3.8	1.7	784	0.419	89.6	0.30	1.00 2758	1.14 180	0.80 88	0.64 22	0.25 8	0.50 2
9	LOCAL	46	0.289	1320	4.4	1.8	1350	0.332	80.3	0.26	1.02 2512	1.07 328	0.78 142	0.29 55	0.54 13	0.29 7
15	LOCAL	43	0.304	1368	4.3	2.7	1406	0.305	79.4	0.20	0.99 2556	1.11 363	0.97 119	0.44 27	0.83 6	0.00 1

Table 5.19. Verification of local surface wind forecasts for 92 stations in the conterminous U.S. for the FT issuance time of approximately 1800 UTC.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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
3	LOCAL	26	0.474	11018	3.1	1.1	11079	0.406	72.1	0.11	0.97 11143	1.19 3473	0.80 1115	0.52 256	0.59 49	0.30 10
9	LOCAL	33	0.387	7350	4.1	2.4	7514	0.307	80.2	0.00	0.97 13579	1.28 1837	0.89 482	0.32 119	0.44 18	0.33 3
15	LOCAL	36	0.354	6519	4.2	2.4	6692	0.295	81.6	0.05	0.98 13544	1.26 1632	0.74 469	0.37 105	0.23 31	0.50 2

Table 5.20. Same as Table 5.19 except for 24 stations in the Eastern Region.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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
3	LOCAL	26	0.452	3110	3.0	1.4	3122	0.364	71.0	0.00	0.95 3005	1.18 956	0.90 230	0.90 29	0.60 5	0.00 2
9	LOCAL	33	0.365	2177	4.0	2.3	2225	0.295	79.3	0.00	0.98 3540	1.21 524	0.86 132	0.16 32	2.50 2	1.00 1
15	LOCAL	36	0.316	1953	4.0	2.4	1996	0.297	80.7	0.14	0.99 3585	1.18 502	0.73 118	0.53 19	1.33 3	** 0

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

Table 5.21. Same as Table 5.19 except for 22 stations in the Southern Region.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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
3	LOCAL	27	0.478	2707	3.0	1.5	2724	0.394	75.5	0.22	0.97 2898	1.24 717	0.62 196	0.48 31	0.13 8	*** 0
9	LOCAL	31	0.414	1504	4.1	2.7	1541	0.263	84.6	0.00	0.98 3422	1.28 334	0.74 62	0.31 13	0.00 3	* 0
15	LOCAL	37	0.337	1243	4.2	2.5	1283	0.239	86.6	0.00	1.01 3325	1.08 286	0.55 64	0.20 10	0.00 3	* 0

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

Table 5.22. Same as Table 5.19 except for 28 stations in the Central Region.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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
3	LOCAL	23	0.504	3682	3.0	0.6	3697	0.406	65.7	0.09	0.94 2787	1.27 1332	0.80 529	0.41 138	0.67 27	0.00 4
9	LOCAL	31	0.403	2680	4.0	2.1	2735	0.305	74.0	0.00	0.94 3817	1.35 743	1.02 196	0.26 54	0.50 6	0.00 1
15	LOCAL	34	0.376	2514	4.1	2.0	2572	0.286	75.1	0.00	0.96 3877	1.36 661	0.81 207	0.30 56	0.00 13	0.00 1

Table 5.23. Same as Table 5.19 except for 18 stations in the Western Region.

		Direction			Speed											
								Contingency Table								
											Bias by Category					
Fcst Proj (h)	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
3	LOCAL	34	0.401	1519	3.4	1.3	1536	0.398	78.9	0.17	1.03 2453	0.93 468	0.87 160	0.62 58	0.78 9	0.25 4
9	LOCAL	46	0.283	989	4.6	2.7	1013	0.325	85.7	0.00	0.99 2800	1.24 236	0.78 92	0.75 20	0.00 7	0.00 1
15	LOCAL	46	0.305	809	5.0	3.1	841	0.310	86.9	0.07	0.99 2757	1.42 183	0.75 80	0.50 20	0.25 12	0.00 1

Table 5.24. 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											
								Contingency Table								
											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	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	LOCAL	23	0.557	359	3.7	2.4	371	0.496	87.1	0.22	0.99 907	1.02 97	1.16 32	1.00 13	0.40 5	**** 0
9	LOCAL	38	0.342	358	5.0	3.4	382	0.336	81.7	0.00	0.99 890	0.93 115	1.26 31	1.07 14	2.00 1	**** 0
15	LOCAL	48	0.271	385	5.2	3.3	405	0.297	79.4	0.13	0.99 863	0.96 112	1.14 42	1.36 11	1.50 2	3.00 1

**** This category was forecast four times but was not observed.

Table 5.25. Same as Table 5.24 except for the FT release time of approximately 1800 UTC.

Fcst Proj (h)	Type of Fcst.	Direction			Speed											
								Contingency Table								
											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	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	LOCAL	31	0.412	366	3.9	2.0	373	0.412	83.5	0.33	1.00 855	1.06 108	0.80 41	0.91 11	2.50 2	0.00 1
9	LOCAL	38	0.378	339	5.2	3.4	363	0.292	82.2	0.33	0.95 915	1.70 71	0.85 39	0.90 10	4.00 1	0.00 3
15	LOCAL	47	0.272	333	6.0	4.1	362	0.265	80.4	0.00	0.97 895	1.21 95	1.14 29	1.23 13	1.00 5	* 0

* This category was neither forecast nor observed.

Table 5.26. Comparative verification of MOS and local 42-h surface wind speed forecasts for 92 stations in the conterminous U.S., 0000 UTC cycle.

Type of Verifying Observation	Type of Forecast	Bias by Category ≤22 kt	Bias by Category >22 kt	Skill Score	Percent Forecast Correct	Threat Score >22 kt
1-min Avg	MOS	1.01	0.49	0.203	97.5	0.12
	LOCAL	0.96	2.64	0.232	94.2	0.15
	No. Obs.	15513	340			
±3-h Max	MOS	1.04	0.20	0.177	94.9	0.11
	LOCAL	1.00	1.07	0.298	92.7	0.20
	No. Obs.	15008	837			

Table 5.27. Same as Table 5.26 except for 92 stations, 1200 UTC cycle.

Type of Verifying Observation	Type of Forecast	Bias by Category ≤22 kt	Bias by Category >22 kt	Skill Score	Percent Forecast Correct	Threat Score >22 kt
1-min Avg	MOS	1.01	0.44	0.175	99.0	0.10
	LOCAL	0.96	5.07	0.119	95.3	0.07
	No. Obs.	15691	140			
±3-h Max	MOS	1.03	0.13	0.118	97.0	0.07
	LOCAL	0.99	1.46	0.230	94.4	0.15
	No. Obs.	15324	486			

Table 5.28. Comparative verification of MOS and local 42-h surface wind speed forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Type of Verifying Observation	Type of Forecast	Bias by Category ≤22 kt	Bias by Category >22 kt	Skill Score	Percent Forecast Correct	Threat Score >22 kt
1-min Avg	MOS	0.99	1.71	0.090	96.8	0.06
	LOCAL	0.98	2.21	0.163	96.5	0.10
	No. Obs.	1044	14			
±3-h Max	MOS	1.01	0.71	0.185	95.5	0.12
	LOCAL	1.00	0.91	0.190	95.0	0.12
	No. Obs.	995	34			

Table 5.29. Same as Table 5.28 except for 1200 UTC.

Type of Verifying Observation	Type of Forecast	Bias by Category ≤22 kt	Bias by Category >22 kt	Skill Score	Percent Forecast Correct	Threat Score >22 kt
1-min Avg	MOS	0.99	1.43	0.223	97.5	0.13
	LOCAL	0.99	1.50	0.216	97.4	0.13
	No. Obs.	1028	14			
±3-h Max	MOS	1.01	0.71	0.190	96.2	0.12
	LOCAL	1.01	0.75	0.143	95.9	0.09
	No. Obs.	982	28			

Table 6.1. Definitions of the total cloud amount categories used for the local forecasts and observations. The MOS guidance was defined for these same categories, but for opaque amounts only.

Category	Cloud Amount
1	CLR, -SCT, -BKN, -OVC, -X
2	SCT
3	BKN
4	OVC, X

Table 6.2. Comparative verification of MOS and local forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 94 stations in the conterminous U.S., 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	0.97	1.53	1.18	0.81	59.5	0.418
	LOCAL	0.76	1.49	1.63	0.92	68.0	0.546
	No. Obs.	6157	2019	1563	6363		
18	MOS	0.80	1.66	1.33	0.76	53.8	0.374
	LOCAL	0.57	1.63	1.96	0.77	51.2	0.354
	No. Obs.	5625	2726	2107	5801		
24	MOS	0.81	1.58	1.36	0.80	54.0	0.369
	LOCAL	0.60	1.62	2.06	0.78	48.0	0.308
	No. Obs.	6074	2812	1830	5553		

Table 6.3. Same as Table 6.2 except for 24 stations in the Eastern Region.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	0.91	1.43	1.35	0.82	55.6	0.371
	LOCAL	0.74	1.33	1.59	0.88	63.0	0.473
	No. Obs.	1057	630	505	1947		
18	MOS	0.78	1.51	1.30	0.82	55.4	0.385
	LOCAL	0.52	1.47	1.88	0.78	52.9	0.361
	No. Obs.	1031	691	630	1788		
24	MOS	0.81	1.48	1.19	0.92	56.2	0.384
	LOCAL	0.61	1.54	1.98	0.84	51.4	0.337
	No. Obs.	1335	618	477	1708		

Table 6.4. Same as Table 6.2 except for 24 stations in the Southern Region.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	0.95	1.51	1.05	0.87	63.4	0.470
	LOCAL	0.78	1.46	1.60	0.92	69.9	0.575
	No. Obs.	1665	516	396	1462		
18	MOS	0.85	1.40	1.33	0.79	55.8	0.398
	LOCAL	0.64	1.53	1.85	0.74	51.6	0.359
	No. Obs.	1558	810	544	1250		
24	MOS	0.82	1.51	1.40	0.75	55.2	0.384
	LOCAL	0.59	1.72	1.80	0.79	46.9	0.293
	No. Obs.	1730	793	486	1160		

Table 6.5. Same as Table 6.2 except for 28 stations in the Central Region.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	0.99	1.63	1.13	0.78	59.2	0.396
	LOCAL	0.69	1.76	1.88	0.94	66.0	0.518
	No. Obs.	2117	560	383	1773		
18	MOS	0.71	2.09	1.33	0.72	50.9	0.338
	LOCAL	0.43	2.04	2.14	0.77	46.9	0.307
	No. Obs.	1855	757	561	1648		
24	MOS	0.75	1.82	1.39	0.76	51.5	0.337
	LOCAL	0.48	1.81	2.36	0.78	45.1	0.276
	No. Obs.	1840	834	473	1678		

Table 6.6. Same as Table 6.2 except for 18 stations in the Western Region.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	1.02	1.60	1.14	0.78	60.1	0.409
	LOCAL	0.86	1.38	1.43	0.96	75.1	0.633
	No. Obs.	1318	313	279	1181		
18	MOS	0.91	1.66	1.39	0.68	53.5	0.360
	LOCAL	0.76	1.37	2.02	0.76	55.2	0.393
	No. Obs.	1181	468	372	1115		
24	MOS	0.88	1.44	1.46	0.72	53.2	0.363
	LOCAL	0.77	1.30	2.10	0.66	49.3	0.322
	No. Obs.	1169	567	394	1007		

Table 6.7. Comparative verification of MOS and local forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 94 stations in the conterminous U.S., 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category				Percent Correct	Skill Score
		1	2	3	4		
12	MOS	0.89	1.59	1.31	0.72	56.0	0.395
	LOCAL	0.76	1.31	1.70	0.88	62.4	0.486
	No. Obs.	6070	2804	1829	5555		
18	MOS	0.97	1.59	1.17	0.81	60.5	0.418
	LOCAL	0.65	1.82	2.35	0.84	54.5	0.373
	No. Obs.	7061	1862	1397	5765		
24	MOS	0.94	1.59	1.19	0.82	58.3	0.403
	LOCAL	0.64	1.81	2.08	0.83	51.8	0.338
	No. Obs.	6172	2027	1540	6344		

Table 6.8. Same as Table 6.7 except for 24 stations in the Eastern Region.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	0.89	1.50	1.24	0.84	57.6	0.407
	LOCAL	0.68	1.35	1.90	0.88	59.7	0.444
	No. Obs.	1346	608	481	1715		
18	MOS	1.00	1.55	1.16	0.83	58.9	0.398
	LOCAL	0.67	1.79	2.28	0.79	54.0	0.360
	No. Obs.	1428	445	403	1861		
24	MOS	0.92	1.52	1.34	0.79	55.0	0.365
	LOCAL	0.77	1.41	1.89	0.77	53.2	0.349
	No. Obs.	1068	625	498	1961		

Table 6.9. Same as Table 6.7 except for 24 stations in the Southern Region.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	0.88	1.59	1.23	0.69	57.5	0.410
	LOCAL	0.77	1.33	1.47	0.93	65.3	0.523
	No. Obs.	1745	796	477	1169		
18	MOS	0.96	1.59	1.02	0.83	63.4	0.449
	LOCAL	0.67	1.83	2.14	0.87	57.6	0.408
	No. Obs.	1956	476	357	1236		
24	MOS	0.93	1.50	1.01	0.90	62.0	0.448
	LOCAL	0.65	1.88	1.94	0.85	53.5	0.362
	No. Obs.	1687	517	382	1464		

Table 6.10. Same as Table 6.7 except for 28 stations in the Central Region.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	0.90	1.68	1.32	0.68	54.7	0.375
	LOCAL	0.71	1.40	1.88	0.87	61.8	0.478
	No. Obs.	1829	826	476	1677		
18	MOS	0.94	1.65	1.30	0.80	60.3	0.406
	LOCAL	0.56	2.12	2.72	0.87	52.0	0.343
	No. Obs.	2267	547	346	1647		
24	MOS	0.92	1.80	1.17	0.80	58.1	0.388
	LOCAL	0.52	2.31	2.34	0.86	47.3	0.286
	No. Obs.	2116	566	378	1755		

Table 6.11. Same as Table 6.7 except for 18 stations in the Western Region.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct	Skill Score
12	MOS	0.89	1.54	1.47	0.63	53.5	0.370
	LOCAL	0.93	1.09	1.54	0.82	63.0	0.492
	No. Obs.	1150	574	395	994		
18	MOS	0.97	1.55	1.23	0.76	59.0	0.400
	LOCAL	0.75	1.44	2.26	0.82	55.3	0.375
	No. Obs.	1410	394	291	1021		
24	MOS	1.00	1.50	1.22	0.81	58.3	0.385
	LOCAL	0.71	1.57	2.23	0.87	54.5	0.361
	No. Obs.	1301	319	282	1164		

Table 6.12. Comparative verification of MOS and local 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 1	2	3	4	Percent Correct	Skill Score
12	MOS	1.01	0.86	0.73	1.07	70.2	0.513
	LOCAL	0.79	0.98	1.48	1.05	68.6	0.503
	No. Obs.	339	87	99	540		
18	MOS	0.94	0.75	1.15	1.05	65.0	0.441
	LOCAL	0.83	1.12	1.36	0.99	61.5	0.403
	No. Obs.	279	110	117	554		
24	MOS	0.90	0.77	0.79	1.15	65.9	0.447
	LOCAL	0.80	1.15	1.55	0.96	60.4	0.399
	No. Obs.	283	118	109	531		

Table 6.13. Same as Table 6.12 except for 1200 UTC.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Percent Correct.	Skill Score
12	MOS	1.04	0.86	1.10	0.99	67.1	0.489
	LOCAL	0.84	1.02	1.66	0.94	66.5	0.494
	No. Obs.	275	117	110	526		
18	MOS	1.10	0.62	0.91	1.04	66.1	0.450
	LOCAL	0.75	1.09	2.26	0.90	59.5	0.391
	No. Obs.	291	116	93	547		
24	MOS	0.96	0.66	0.92	1.10	67.3	0.463
	LOCAL	0.62	1.56	2.06	0.95	57.5	0.360
	No. Obs.	329	87	98	533		

Table 7.1. Definitions of the categories used for verification of persistence, local, and guidance forecasts of ceiling height and visibility.

Category	Ceiling (ft)	Visibility (mi)
1	≤ 400	< 1
2	500 - 900	1 - 2 3/4
3	1000 - 2900	3 - 6
4	≥ 3000	> 6

Table 7.2. Comparative verification of MOS and persistence ceiling height forecasts for 91 stations in the conterminous U.S., 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
12	MOS	1.30	0.78	0.92	1.01	3.256	75.3	0.379
	PERSISTENCE	0.85	0.92	0.91	1.03	1.868	83.9	0.584
	No. Obs.	768	823	2026	11250			
18	MOS	1.38	0.85	1.10	0.98	2.516	76.7	0.392
	PERSISTENCE	1.75	0.93	0.85	1.01	2.852	75.5	0.339
	No. Obs.	372	821	2156	11605			
24	MOS	1.70	0.80	0.99	0.99	2.080	81.5	0.365
	PERSISTENCE	2.26	1.32	1.16	0.94	3.096	74.5	0.226
	No. Obs.	288	576	1574	12429			

Table 7.3. Same as Table 7.2 except for 92 stations, 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
12	MOS	1.36	0.79	1.02	1.00	1.873	82.8	0.398
	PERSISTENCE	0.90	1.05	1.18	0.98	1.179	87.5	0.581
	No. Obs.	293	580	1558	12637			
18	MOS	1.55	0.78	0.91	1.00	2.721	78.7	0.362
	PERSISTENCE	0.52	0.95	1.06	1.01	2.290	78.9	0.351
	No. Obs.	513	658	1760	12161			
24	MOS	1.69	0.80	0.86	0.99	3.765	73.0	0.339
	PERSISTENCE	0.35	0.76	0.92	1.08	3.361	72.2	0.234
	No. Obs.	770	812	2036	11289			

Table 7.4. Verification of MOS ceiling height forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
12	MOS	0.86	1.24	1.49	0.87	3.077	68.3	0.317
	PERSISTENCE	1.14	1.26	0.91	1.00	2.013	82.3	0.569
	No. Obs.	28	42	183	738			
18	MOS	0.48	0.94	1.59	0.86	3.076	66.4	0.318
	PERSISTENCE	1.32	0.98	0.84	1.03	3.179	70.0	0.305
	No. Obs.	25	54	198	697			
24	MOS	0.71	1.14	1.73	0.81	2.962	66.5	0.306
	PERSISTENCE	1.94	1.28	0.88	0.99	3.448	68.5	0.234
	No. Obs.	17	43	188	729			

Table 7.5. Same as Table 7.4 except for 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
12	MOS	1.56	1.16	1.43	0.86	2.881	70.2	0.360
	PERSISTENCE	1.25	0.98	1.03	0.99	1.878	80.6	0.532
	No. Obs.	16	45	187	718			
18	MOS	0.89	0.90	1.69	0.84	3.534	64.4	0.279
	PERSISTENCE	0.78	0.78	1.04	1.02	2.857	71.9	0.332
	No. Obs.	27	58	181	715			
24	MOS	1.04	1.43	1.77	0.79	3.567	63.7	0.272
	PERSISTENCE	0.81	1.02	1.09	0.98	3.192	69.6	0.261
	No. Obs.	26	44	174	727			

Table 7.6. Comparative verification of local and persistence ceiling height forecasts for 91 stations in the conterminous U.S. for the FT issuance time of approximately 0900 UTC.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
3	LOCAL	0.82	0.86	1.09	1.01	2.081	82.0	0.546
	PERSISTENCE	0.83	0.92	0.95	1.03	1.831	84.2	0.592
	No. Obs.	836	896	2066	11959			
6	LOCAL	0.53	0.70	1.09	1.04	2.457	78.4	0.445
	PERSISTENCE	0.94	0.87	0.88	1.04	2.600	78.2	0.444
	No. Obs.	735	940	2223	11832			
9	LOCAL	0.40	0.54	1.03	1.04	1.972	79.5	0.403
	PERSISTENCE	2.00	1.00	0.85	1.00	2.815	75.6	0.342
	No. Obs.	347	824	2304	12263			
15	LOCAL	0.31	0.62	1.29	1.00	1.802	81.9	0.376
	PERSISTENCE	2.07	1.31	1.18	0.94	3.157	74.0	0.223
	No. Obs.	335	629	1657	13115			

Table 7.7. Same as Table 7.6 except for 92 stations for the FT issuance time of approximately 1800 UTC.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
3	LOCAL	0.62	0.87	1.13	0.99	1.299	85.6	0.542
	PERSISTENCE	1.24	1.29	1.19	0.95	1.397	85.2	0.566
	No. Obs.	288	646	1954	13132			
6	LOCAL	0.45	0.76	1.28	0.99	1.510	84.1	0.461
	PERSISTENCE	1.07	1.29	1.39	0.94	1.909	80.8	0.421
	No. Obs.	336	645	1668	13367			
9	LOCAL	0.54	0.85	1.25	0.99	1.814	82.1	0.426
	PERSISTENCE	0.92	1.26	1.32	0.95	2.308	78.0	0.350
	No. Obs.	392	662	1756	13197			
15	LOCAL	0.55	0.96	1.32	0.98	2.757	75.9	0.371
	PERSISTENCE	0.51	1.01	1.17	1.00	3.245	71.9	0.245
	No. Obs.	697	818	1977	12265			

Table 7.8. 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 1	2	3	4	Log Score	Percent Correct	Skill Score
3	LOCAL	2.14	0.84	0.89	0.99	2.880	78.0	0.467
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	29	44	184	762			
6	LOCAL	1.75	0.55	1.01	1.00	3.535	72.7	0.348
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	32	58	175	755			
9	LOCAL	1.85	0.33	0.92	1.05	4.006	66.7	0.224
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	27	58	208	724			
15	LOCAL	2.28	0.29	1.01	1.01	3.461	69.2	0.228
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	18	45	189	745			

* Persistence observations were unavailable.

Table 7.9. Same as Table 7.8 except for the FT issuance time of approximately 1800 UTC.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
3	LOCAL	2.72	0.74	0.95	0.99	3.295	72.5	0.339
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	18	46	193	748			
6	LOCAL	1.62	0.48	0.96	1.02	3.359	72.0	0.315
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	26	44	194	740			
9	LOCAL	1.57	0.19	1.04	1.03	3.746	67.6	0.219
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	28	59	192	746			
15	LOCAL	1.34	0.29	1.18	0.99	3.649	67.9	0.218
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	29	45	185	763			

Table 7.10. Comparative verification of MOS and persistence visibility forecasts for 91 stations in the conterminous U.S., 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
12	MOS	1.40	1.01	1.14	0.96	3.030	75.0	0.339
	PERSISTENCE	0.77	0.79	0.89	1.04	1.657	84.7	0.540
	No. Obs.	515	797	1814	11849			
18	MOS	1.24	1.05	1.22	0.97	2.247	79.0	0.321
	PERSISTENCE	1.42	0.79	1.15	0.99	2.513	77.9	0.257
	No. Obs.	275	795	1400	12600			
24	MOS	1.64	0.98	1.08	0.99	1.745	83.3	0.331
	PERSISTENCE	2.67	1.01	1.31	0.95	2.523	77.8	0.187
	No. Obs.	148	619	1241	13123			

Table 7.11. Same as Table 7.10 except for 92 stations, 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
12	MOS	1.38	0.77	1.00	1.01	1.547	85.1	0.363
	PERSISTENCE	1.38	1.03	0.97	1.00	1.108	89.0	0.544
	No. Obs.	160	621	1251	13294			
18	MOS	1.48	0.95	1.06	0.98	2.115	81.8	0.322
	PERSISTENCE	0.80	1.28	0.85	1.01	1.902	82.6	0.310
	No. Obs.	276	502	1414	13000			
24	MOS	1.95	1.03	1.02	0.95	3.537	73.3	0.302
	PERSISTENCE	0.42	0.81	0.67	1.09	3.039	74.8	0.172
	No. Obs.	531	785	1805	11898			

Table 7.12. Comparative verification of MOS and persistence visibility forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
12	MOS	0.57	1.47	1.04	0.99	2.874	75.0	0.238
	PERSISTENCE	0.90	1.23	0.89	1.01	1.845	84.0	0.501
	No. Obs.	40	43	102	810			
18	MOS	0.49	1.24	0.95	1.02	3.464	72.3	0.247
	PERSISTENCE	0.71	0.88	0.82	1.05	3.466	72.7	0.223
	No. Obs.	51	59	113	765			
24	MOS	1.16	1.31	1.19	0.95	3.151	72.6	0.200
	PERSISTENCE	1.44	0.85	1.00	1.00	3.142	74.5	0.189
	No. Obs.	25	62	91	817			

Table 7.13. Same as Table 7.12 except for the 1200 UTC cycle.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
12	MOS	0.91	0.97	1.12	0.99	2.949	75.6	0.235
	PERSISTENCE	1.61	1.25	1.00	0.96	2.388	79.9	0.403
	No. Obs.	23	61	93	807			
18	MOS	0.52	0.90	1.22	1.00	3.073	73.6	0.199
	PERSISTENCE	1.16	1.23	0.95	0.98	3.280	73.8	0.234
	No. Obs.	31	60	97	797			
24	MOS	0.97	0.98	1.59	0.92	3.398	71.0	0.221
	PERSISTENCE	1.03	1.66	0.88	0.98	3.666	70.5	0.141
	No. Obs.	36	44	105	787			

Table 7.14. Comparative verification of local and persistence visibility forecasts for 91 stations in the conterminous U.S. for the FT issuance time of approximately 0900 UTC.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
3	LOCAL	0.82	0.75	1.34	0.97	1.935	80.9	0.474
	PERSISTENCE	0.78	0.79	0.92	1.04	1.608	85.1	0.548
	No. Obs.	552	809	1860	12524			
6	LOCAL	0.45	0.41	1.13	1.06	2.378	77.4	0.340
	PERSISTENCE	0.83	0.59	0.90	1.06	2.471	77.9	0.354
	No. Obs.	517	1098	1878	12223			
9	LOCAL	0.31	0.39	1.09	1.04	1.658	83.2	0.323
	PERSISTENCE	1.79	0.84	1.19	0.97	2.427	78.7	0.270
	No. Obs.	240	767	1428	13294			
15	LOCAL	0.37	0.41	1.07	1.03	1.433	85.4	0.315
	PERSISTENCE	2.59	1.00	1.38	0.95	2.533	78.1	0.196
	No. Obs.	166	643	1234	13681			

Table 7.15. Same as Table 7.14 except for 92 stations for the FT issuance time of approximately 1800 UTC.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
3	LOCAL	0.55	0.64	1.32	1.00	1.197	87.4	0.464
	PERSISTENCE	1.13	1.22	1.19	0.97	1.273	87.7	0.515
	No. Obs.	224	635	1209	13942			
6	LOCAL	0.67	0.51	1.19	1.01	1.263	86.6	0.407
	PERSISTENCE	1.46	1.19	1.16	0.97	1.561	84.8	0.402
	No. Obs.	174	646	1247	13940			
9	LOCAL	0.76	0.79	1.18	0.99	1.427	85.2	0.358
	PERSISTENCE	1.35	1.55	1.10	0.97	1.809	82.8	0.315
	No. Obs.	188	496	1313	14002			
15	LOCAL	0.60	0.92	1.28	0.98	2.332	78.1	0.309
	PERSISTENCE	0.57	1.19	0.85	1.02	2.644	77.1	0.217
	No. Obs.	435	645	1686	12976			

Table 7.16. 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 1	2	3	4	Log Score	Percent Correct	Skill Score
3	LOCAL	0.87	0.95	1.12	0.99	1.896	81.5	0.415
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	38	44	101	836			
6	LOCAL	0.78	0.68	1.15	1.02	2.651	77.9	0.332
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	41	59	101	816			
9	LOCAL	0.41	0.41	1.04	1.08	3.070	75.3	0.252
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	54	59	111	790			
15	LOCAL	0.44	0.40	1.33	1.02	2.200	78.0	0.225
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	25	58	87	827			

* Persistence observations were unavailable.

Table 7.17. Same as Table 7.16 except for the FT issuance time of approximately 1800 UTC.

Projection (h)	Type of Forecast	Bias by Category 1	2	3	4	Log Score	Percent Correct	Skill Score
3	LOCAL	0.58	0.53	1.09	1.04	1.893	81.1	0.331
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	24	58	92	827			
6	LOCAL	0.46	0.32	0.85	1.10	2.236	79.4	0.288
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	26	74	103	802			
9	LOCAL	0.38	0.41	0.98	1.07	2.553	77.1	0.187
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	34	61	97	833			
15	LOCAL	0.56	0.50	0.96	1.05	2.789	75.4	0.151
	PERSISTENCE	*	*	*	*	*	*	*
	No. Obs.	39	46	105	836			

* Persistence observations were unavailable.

Table 8.1. Verification of MOS and local max/min temperature forecasts for 93 stations in the conterminout 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	MOS		-0.4	3.5	3.2	--	--	83.3
Max	LOCAL	15982	-0.2	3.1	1.9	--	--	86.8
Tonight's	MOS		-0.5	3.8	3.7	0.60	0.34	78.5
Min	LOCAL	15844	-0.2	3.7	3.3	0.62	0.34	79.8
Tomorrow's	MOS		-0.7	4.4	7.1	--	--	73.8
Max	LOCAL	15962	-0.7	4.2	6.0	--	--	76.6
Tomorrow	MOS		-0.1	4.9	9.5	0.43	0.41	64.6
Night's Min	LOCAL	15780	-0.3	4.7	8.5	0.44	0.41	66.6

Table 8.2. Same as Table 8.1 except for 24 stations in the Eastern Region.

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	MOS	4212	-0.4	3.4	2.7	--	--	83.8
	LOCAL		-0.3	3.0	1.6	--	--	86.7
Tonight's Min	MOS	4157	-0.8	3.5	2.0	0.68	0.35	81.5
	LOCAL		-0.6	3.5	2.0	0.72	0.34	81.5
Tomorrow's Max	MOS	4210	-0.9	4.0	5.1	--	--	76.9
	LOCAL		-0.9	3.9	4.6	--	--	78.1
Tomorrow Night's Min	MOS	4151	-0.9	4.5	6.7	0.56	0.42	69.1
	LOCAL		-0.8	4.5	6.5	0.57	0.41	69.6

Table 8.3. Same as Table 8.1 except for 24 stations in the Southern Region.

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	MOS	4019	-0.3	3.8	4.5	--	--	80.0
	LOCAL		-0.1	3.3	3.0	--	--	84.0
Tonight's Min	MOS	4010	0.1	3.7	3.4	0.51	0.37	79.9
	LOCAL		0.1	3.6	3.0	0.53	0.41	81.1
Tomorrow's Max	MOS	4013	-0.9	4.5	8.3	--	--	71.5
	LOCAL		-0.7	4.3	7.2	--	--	74.2
Tomorrow Night's Min	MOS	4004	0.3	4.8	9.3	0.35	0.44	65.8
	LOCAL		-0.1	4.7	8.2	0.40	0.44	67.6

Table 8.4. Same as Table 8.1 except for 28 stations in the Central Region.

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	MOS	4782	-0.4	3.6	3.3	--	--	85.9
	LOCAL		-0.1	3.2	1.7	--	--	89.1
Tonight's Min	MOS	4767	-0.6	4.1	4.8	0.58	0.30	78.5
	LOCAL		-0.1	4.0	4.4	0.60	0.28	79.7
Tomorrow's Max	MOS	4779	-0.9	4.9	9.1	--	--	74.7
	LOCAL		-0.8	4.5	7.2	--	--	78.0
Tomorrow Night's Min	MOS	4747	0.1	5.3	12.3	0.39	0.34	64.0
	LOCAL		-0.1	5.1	11.1	0.37	0.36	65.9

Table 8.5. Same as Table 8.1 except for 17 stations in the Western Region.

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	MOS	2969	-0.5	3.3	2.0	--	--	81.2
	LOCAL		-0.2	2.9	1.1	--	--	85.6
Tonight's Min	MOS	2910	-0.5	4.0	4.7	0.60	0.35	71.2
	LOCAL		-0.3	3.6	3.7	0.57	0.30	75.2
Tomorrow's Max	MOS	2960	0.1	4.1	5.3	--	--	70.1
	LOCAL		-0.2	3.7	4.4	--	--	74.4
Tomorrow Night's Min	MOS	2878	0.1	4.8	9.1	0.34	0.44	57.0
	LOCAL		-0.3	4.5	7.5	0.34	0.44	61.5

Table 8.6. Verification of MOS and local max/min temperature forecasts for 93 stations in the conterminous U.S., 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	MOS	15851	-0.8	3.6	2.9	0.64	0.31	81.1
	LOCAL		-0.7	3.3	2.2	0.66	0.31	84.1
Tomorrow's Max	MOS	15960	-0.7	4.2	6.7	--	--	76.2
	LOCAL		-0.7	3.8	4.2	--	--	81.1
Tomorrow Night's Min	MOS	15812	-0.7	4.5	7.2	0.56	0.44	70.4
	LOCAL		-0.5	4.2	5.9	0.57	0.39	73.3
Day After Tomorrow's Max	MOS	15944	-1.0	5.2	11.0	--	--	65.6
	LOCAL		-1.0	4.8	9.4	--	--	69.0

Table 8.7. Same as Table 8.6 except for 24 stations in the Eastern Region.

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	MOS	4153	-1.0	3.3	1.4	0.71	0.29	83.7
	LOCAL		-1.0	3.2	1.2	0.71	0.32	85.0
Tomorrow's Max	MOS	4206	-0.7	3.8	4.7	--	--	79.0
	LOCAL		-0.9	3.7	3.6	--	--	80.7
Tomorrow Night's Min	MOS	4149	-1.2	4.2	4.6	0.66	0.42	73.9
	LOCAL		-0.9	4.1	4.1	0.64	0.40	75.2
Day After Tomorrow's Max	MOS	4203	-1.2	4.7	8.0	--	--	69.6
	LOCAL		-1.2	4.6	7.7	--	--	70.4

Table 8.8. Same as Table 8.6 except for 24 stations in the Southern Region.

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	MOS	4016	-0.4	3.6	3.0	0.56	0.36	81.5
	LOCAL		-0.5	3.2	1.7	0.61	0.34	84.9
Tomorrow's Max	MOS	4020	-0.8	4.6	9.4	--	--	70.5
	LOCAL		-0.6	3.9	5.6	--	--	78.0
Tomorrow Night's Min	MOS	4011	-0.5	4.4	6.9	0.50	0.53	71.9
	LOCAL		-0.4	4.1	5.3	0.50	0.47	75.3
Day After Tomorrow's Max	MOS	4016	-1.6	5.3	12.3	--	--	63.4
	LOCAL		-1.1	4.9	10.7	--	--	66.9

Table 8.9. Same as Table 8.6 except for 28 stations in the Central Region.

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	MOS	4778	-0.8	3.9	3.8	0.64	0.30	81.2
	LOCAL		-0.5	3.5	3.1	0.64	0.30	84.1
Tomorrow's Max	MOS	4791	-0.9	4.4	7.5	--	--	79.3
	LOCAL		-0.7	4.0	4.7	--	--	83.6
Tomorrow Night's Min	MOS	4772	-0.6	4.9	9.3	0.53	0.38	70.0
	LOCAL		-0.3	4.6	7.7	0.55	0.33	72.7
Day After Tomorrow's Max	MOS	4788	-0.9	5.7	14.5	--	--	65.9
	LOCAL		-0.9	5.3	12.1	--	--	70.5

Table 8.10. Same as Table 8.6 except for 17 stations in the Western Region.

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	MOS	2904	-0.9	3.6	3.4	0.63	0.32	76.4
	LOCAL		-0.6	3.1	2.7	0.65	0.25	81.3
Tomorrow's Max	MOS	2943	-0.4	4.0	4.7	--	--	72.9
	LOCAL		-0.4	3.3	2.4	--	--	80.9
Tomorrow Night's Min	MOS	2880	-0.4	4.5	7.6	0.45	0.42	63.7
	LOCAL		-0.5	4.1	6.2	0.53	0.30	68.2
Day After Tomorrow's Max	MOS	2937	0.0	4.7	7.7	--	--	61.9
	LOCAL		-0.5	4.3	5.8	--	--	66.2

Table 8.11. Verification of MOS and local 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	MOS		1.8	4.3	6.6	--	--	*
	LOCAL	896	0.7	3.8	4.6	--	--	*
Tonight's Min	MOS		1.4	6.1	16.7	0.00	1.00	*
	LOCAL	886	1.7	5.9	14.9	0.00	1.00	*
Tomorrow's Max	MOS		2.3	5.2	10.9	--	--	*
	LOCAL	888	0.8	5.1	11.1	--	--	*
Tomorrow Night's Min	MOS		1.7	6.8	21.7	0.00	1.00	*
	LOCAL	888	2.3	6.9	23.2	0.00	1.00	*

* Percent improvement over climate score is unavailable.

Table 8.12. Same as Table 8.11 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	MOS		-0.4	5.2	11.3	0.00	1.00	*
	LOCAL	860	0.8	5.0	10.8	0.00	**	*
Tomorrow's Max	MOS		1.1	4.7	9.3	--	--	*
	LOCAL	869	0.1	4.3	7.5	--	--	*
Tomorrow Night's Min	MOS		0.8	6.3	19.8	0.00	1.00	*
	LOCAL	857	1.7	6.2	18.9	0.00	**	*
Day After Tomorrow's Max	MOS		1.8	5.5	12.1	--	--	*
	LOCAL	857	0.5	5.2	12.0	--	--	*

* Percent improvement over climate score is unavailable.
** No forecasts of $\leq 32°F$ were made.