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# AFOS-ERA VERIFICATION OF GUIDANCE AND LOCAL AVIATION/PUBLIC WEATHER FORECASTS--NO. 17 (OCTOBER 1991 - MARCH 1992)

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## 1. INTRODUCTION

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

Verification statistics are presented here for the cool season months of October 1991 through March 1992 for maximum/minimum (max/min) temperature, probability of precipitation (PoP), precipitation type, snow amount, cloud amount, surface wind, ceiling height, and visibility. Specific details about the local and objective forecasts and the verifying observations are summarized in Table 1.1. It's important to consider this information when interpreting the verification scores. For example, the objective max/min temperature forecast system is based on calendar day observations for Alaska, but on daytime/nighttime periods for the conterminous U.S. The definitions of the official local max/min temperature forecasts and verifying observations, in turn, differ from those of the guidance.

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

Verification statistics are provided for the 101 stations in the conterminous U.S. and Alaska listed in Table 1.3. The scores are those recommended in the NWS National Verification Plan (National Weather Service, 1982). Definitions of the categories used for verification are given in Table 1.4. For the aviation weather elements, we verified the local forecasts associated with the FT issuance times of approximately 0900 and 1800 UTC. Objective guidance for the aviation weather elements, as well as all local and guidance forecasts for the public weather elements, were verified for the 0000 and 1200 UTC forecast cycles. Because verification data or forecast projections for Alaska differ from those of the conterminous U.S., data for the six Alaskan stations were verified separately from those of the conterminous U.S.

For most weather elements, verification results are presented for all stations in the conterminous U.S. combined, followed by results for each of the four NWS regions in the conterminous U.S. and for the Alaska Region. Max/min temperature and PoP scores are presented in Tables 2.1 - 2.12 and 3.1 - 3.12, respectively. Verification results for precipitation type are shown in Tables 4.1 and 4.2 for stations in the conterminous U.S. only. Similarly, the snow amount verification results shown in Table 5.1 are for the conterminous U.S. only. Tables 6.1 - 6.12 show cloud amount verification scores for the conterminous U.S. stations and the Alaskan stations. For wind speed and direction, objective guidance verification results are presented in Tables 7.1 - 7.12, while the analogous local scores are given in Tables 7.13 - 7.24. Comparative verification results for the 42-h significant wind speed are presented in Tables 7.25 - 7.28. For ceiling height and visibility, objective and local forecast verification scores are shown only for the conterminous U.S. stations combined and for the Alaska Region. Tables 8.1 - 8.4 contain the objective ceiling height forecast results for the conterminous U.S. and the Alaska Region, while Tables 8.5 - 8.8 contain ceiling height scores for the local forecasts. Analogously, Tables 9.1 - 9.8 show guidance and local visibility forecast verification scores for the conterminous U.S. stations and the Alaskan stations.

## 2. SUMMARY (OCTOBER 1991 - MARCH 1992)

Two stations that were included in the 1991 warm season verification, namely, Hobart, Oklahoma and McAlester, Oklahoma, were not included in the 1991-92 cool season verification.

The NGM-based MOS max/min temperature and wind guidance were produced by new forecast equations beginning 1200 UTC October 23, 1991 (Dallavalle et al., 1992).

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

## 3. REFERENCES


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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.

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 1.1. Forecasts and observations in the NWS verification data.

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

Table 1.1. Continued.

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

Table 1.1. Continued.

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

[1]Data sources are as follows:
- FXX - FPC bulletin contains LFM-based MOS guidance for all weather elements for stations in the conterminous U.S.; guidance for Alaska is obtained from the FMAK1 and FMAK2 bulletins
- FWC - FWC bulletin contains NGM-based MOS guidance for max/min temperature, PoP, cloud amount, and surface wind for stations in the conterminous U.S. only; there is no NGM-based guidance for Alaska at this time
- FP - Coded city forecast (FPUS4) bulletin containing official local public weather element forecasts in the conterminous U.S.; data in Alaska are obtained from the FPAK4 bulletin
- FT - Aviation terminal forecast containing official local forecasts for aviation weather elements
- MEF - Manually entered forecast product containing official local forecasts of some weather elements
- SAO - Surface airways observation containing verifying observations corresponding to local and MOS forecasts for most weather elements
- SSM - Surface synoptic report containing verifying observations of snow amount

[2]Precipitation type and snow amount forecasts are not verified for the warm season months of April through September.

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

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

Table 1.3. Ninety-five stations in the conterminous U.S. and six stations in Alaska used for comparative verification of MOS guidance and local forecasts of max/min temperature, probability of precipitation, precipitation type*, snow amount*, cloud amount, surface wind, ceiling height, and visibility. Please note that LAX and BET were not included in the max/min temperature and PoP verifications. LBB and ELP were not included in the 42-h significant wind verification and the local surface wind, ceiling height, and visibility verifications. Also note that TCC and SDF were not available for the snow amount verification. TCC was not available for the cloud amount, 42-h significant wind, and MOS surface wind verifications for the 1200 UTC cycle, the MOS ceiling height and visibility verifications for the 0000 and 1200 UTC cycles, and the local ceiling height and visibility verifications for the FT release time of approximately 0900 UTC.

| | | | |
|---|---|---|---|
| DCA | Washington, D.C. | ORF | Norfolk, Virginia |
| PWM | Portland, Maine | CON | Concord, New Hampshire |
| BOS | Boston, Massachusetts | PVD | Providence, Rhode Island |
| ALB | Albany, New York | BTV | Burlington, Vermont |
| BUF | Buffalo, New York | SYR | Syracuse, New York |
| LGA | New York (LaGuardia), New York | 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 |
| AMA | Amarillo, Texas | | |
| LIT | Little Rock, Arkansas | FSM | Fort Smith, Arkansas |
| MIA* | Miami, Florida | TPA* | Tampa, Florida |
| ATL | Atlanta, Georgia | SAV | Savannah, Georgia |
| MSY | New Orleans, Louisiana | SHV | Shreveport, Louisiana |
| JAN | Jackson, Mississippi | MEI | Meridian, Mississippi |
| ABQ | Albuquerque, New Mexico | TCC | Tucumcari, New Mexico |
| OKC | Oklahoma City, Oklahoma | 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 | BET* | Bethel, Alaska |
| FAI* | Fairbanks, Alaska | OME* | Nome, Alaska |
| JNU* | Juneau, Alaska | YAK* | Yakutat, Alaska |

* These stations were not included in the precipitation type and snow amount verifications.

Table 1.4. Definitions of categories used for verification.

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

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

Table 2.1. Comparative verification of local, LFM MOS, and NGM MOS max/min temperature forecasts for 94 stations in the conterminous U.S., 0000 UTC cycle.

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Today's Max | LOCAL | 16132 | 0.0 | 2.9 | 1.2 | -- | -- | 87.7 |
| | LFM MOS | | -0.4 | 3.4 | 2.4 | -- | -- | 83.5 |
| | NGM MOS | | 0.1 | 3.2 | 1.9 | -- | -- | 84.6 |
| Tonight's Min | LOCAL | 16097 | -0.8 | 3.3 | 1.9 | 0.67 | 0.30 | 85.7 |
| | LFM MOS | | -1.2 | 3.7 | 3.0 | 0.69 | 0.35 | 82.3 |
| | NGM MOS | | -0.7 | 3.6 | 2.6 | 0.72 | 0.34 | 83.5 |
| Tomorrow's Max | LOCAL | 16104 | -0.7 | 3.9 | 4.1 | -- | -- | 78.4 |
| | LFM MOS | | -1.0 | 4.3 | 6.1 | -- | -- | 73.5 |
| | NGM MOS | | -0.3 | 4.2 | 6.1 | -- | -- | 74.1 |
| Tomorrow Night's Min | LOCAL | 16062 | -1.2 | 4.3 | 6.0 | 0.55 | 0.38 | 76.0 |
| | LFM MOS | | -1.3 | 4.7 | 8.0 | 0.58 | 0.41 | 71.8 |
| | NGM MOS | | -1.0 | 4.4 | 6.1 | 0.61 | 0.38 | 75.4 |



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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Tonight's Min | LOCAL | 16238 | -0.7 | 3.0 | 1.1 | 0.70 | 0.24 | 88.5 |
| | LFM MOS | | -1.1 | 3.5 | 2.0 | 0.67 | 0.30 | 84.8 |
| | NGM MOS | | -0.5 | 3.2 | 1.6 | 0.64 | 0.28 | 86.6 |
| Tomorrow's Max | LOCAL | 16244 | -0.5 | 3.5 | 2.9 | -- | -- | 82.6 |
| | LFM MOS | | -0.8 | 4.1 | 5.1 | -- | -- | 76.6 |
| | NGM MOS | | 0.2 | 3.9 | 4.5 | -- | -- | 78.3 |
| Tomorrow Night's Min | LOCAL | 16206 | -1.1 | 3.8 | 3.5 | 0.70 | 0.33 | 81.1 |
| | LFM MOS | | -1.4 | 4.3 | 5.5 | 0.67 | 0.40 | 76.7 |
| | NGM MOS | | -0.8 | 4.0 | 4.1 | 0.68 | 0.37 | 80.0 |
| Day After Tomorrow's Max | LOCAL | 16222 | -0.9 | 4.4 | 6.8 | -- | -- | 72.2 |
| | LFM MOS | | -1.1 | 4.8 | 9.3 | -- | -- | 66.6 |
| | NGM MOS | | -0.2 | 4.7 | 8.2 | -- | -- | 68.3 |

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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Today's Max | LOCAL | 4160 | -0.2 | 2.8 | 1.0 | -- | -- | 87.3 |
| | LFM MOS | | -0.4 | 3.3 | 2.0 | -- | -- | 83.4 |
| | NGM MOS | | -0.1 | 3.1 | 1.1 | -- | -- | 85.1 |
| Tonight's Min | LOCAL | 4152 | -0.7 | 3.2 | 1.5 | 0.73 | 0.32 | 86.5 |
| | LFM MOS | | -1.2 | 3.5 | 2.4 | 0.76 | 0.31 | 83.6 |
| | NGM MOS | | -0.4 | 3.4 | 2.0 | 0.77 | 0.35 | 85.0 |
| Tomorrow's Max | LOCAL | 4150 | -1.3 | 3.8 | 3.3 | -- | -- | 78.8 |
| | LFM MOS | | -1.6 | 4.2 | 4.9 | -- | -- | 74.3 |
| | NGM MOS | | -0.7 | 3.9 | 4.3 | -- | -- | 77.6 |
| Tomorrow Night's Min | LOCAL | 4145 | -1.8 | 4.2 | 4.9 | 0.69 | 0.32 | 77.0 |
| | LFM MOS | | -2.2 | 4.6 | 7.0 | 0.72 | 0.39 | 73.4 |
| | NGM MOS | | -1.0 | 4.2 | 4.8 | 0.66 | 0.36 | 77.6 |



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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Tonight's Min | LOCAL | 4197 | -0.6 | 2.9 | 0.9 | 0.72 | 0.27 | 88.9 |
| | LFM MOS | | -0.9 | 3.3 | 1.5 | 0.69 | 0.30 | 85.8 |
| | NGM MOS | | -0.4 | 3.1 | 1.5 | 0.68 | 0.30 | 87.3 |
| Tomorrow's Max | LOCAL | 4195 | -0.8 | 3.5 | 2.8 | -- | -- | 81.7 |
| | LFM MOS | | -1.1 | 3.9 | 4.1 | -- | -- | 77.0 |
| | NGM MOS | | -0.2 | 3.6 | 2.9 | -- | -- | 80.5 |
| Tomorrow Night's Min | LOCAL | 4190 | -1.2 | 3.7 | 2.2 | 0.77 | 0.34 | 82.8 |
| | LFM MOS | | -1.8 | 4.1 | 3.8 | 0.77 | 0.40 | 78.7 |
| | NGM MOS | | -0.6 | 3.7 | 2.9 | 0.72 | 0.33 | 81.9 |
| Day After Tomorrow's Max | LOCAL | 4189 | -1.6 | 4.3 | 6.0 | -- | -- | 72.3 |
| | LFM MOS | | -2.0 | 4.7 | 7.4 | -- | -- | 67.9 |
| | NGM MOS | | -1.0 | 4.3 | 5.3 | -- | -- | 72.9 |

Table 2.5. Comparative verification of local, LFM MOS, and NGM MOS max/min temperature forecasts for 25 stations in the Southern Region, 0000 UTC cycle.

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Today's Max | LOCAL | 4136 | 0.1 | 2.8 | 1.4 | -- | -- | 84.6 |
| | LFM MOS | | -0.3 | 3.2 | 2.1 | -- | -- | 80.6 |
| | NGM MOS | | -0.2 | 3.0 | 1.4 | -- | -- | 83.0 |
| Tonight's Min | LOCAL | 4129 | -0.6 | 3.3 | 1.5 | 0.66 | 0.30 | 85.3 |
| | LFM MOS | | -0.7 | 3.7 | 2.7 | 0.63 | 0.36 | 81.7 |
| | NGM MOS | | -0.8 | 3.4 | 1.9 | 0.69 | 0.37 | 83.7 |
| Tomorrow's Max | LOCAL | 4134 | -0.3 | 3.6 | 3.4 | -- | -- | 75.2 |
| | LFM MOS | | -0.5 | 3.8 | 4.3 | -- | -- | 72.1 |
| | NGM MOS | | -0.4 | 4.0 | 5.3 | -- | -- | 69.4 |
| Tomorrow Night's Min | LOCAL | 4121 | -0.9 | 4.3 | 5.6 | 0.51 | 0.43 | 75.0 |
| | LFM MOS | | -0.7 | 4.6 | 7.0 | 0.53 | 0.43 | 71.4 |
| | NGM MOS | | -0.8 | 4.4 | 5.5 | 0.55 | 0.41 | 74.4 |



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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Tonight's Min | LOCAL | 4145 | -0.6 | 2.9 | 0.8 | 0.72 | 0.27 | 88.2 |
| | LFM MOS | | -0.9 | 3.5 | 1.7 | 0.59 | 0.33 | 83.8 |
| | NGM MOS | | -0.6 | 3.2 | 1.2 | 0.58 | 0.32 | 86.3 |
| Tomorrow's Max | LOCAL | 4146 | -0.1 | 3.3 | 2.7 | -- | -- | 79.4 |
| | LFM MOS | | -0.5 | 3.8 | 4.1 | -- | -- | 73.2 |
| | NGM MOS | | 0.1 | 3.6 | 4.0 | -- | -- | 74.5 |
| Tomorrow Night's Min | LOCAL | 4134 | -0.9 | 3.8 | 3.5 | 0.63 | 0.33 | 79.7 |
| | LFM MOS | | -0.9 | 4.3 | 5.3 | 0.58 | 0.41 | 75.4 |
| | NGM MOS | | -0.7 | 4.0 | 4.0 | 0.60 | 0.41 | 78.4 |
| Day After Tomorrow's Max | LOCAL | 4144 | -0.3 | 4.1 | 5.5 | -- | -- | 68.5 |
| | LFM MOS | | -0.6 | 4.4 | 6.9 | -- | -- | 64.9 |
| | NGM MOS | | 0.2 | 4.5 | 7.1 | -- | -- | 61.5 |

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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Today's Max | LOCAL | 4901 | 0.1 | 3.1 | 1.5 | -- | -- | 89.8 |
| | LFM MOS | | -0.2 | 3.7 | 3.1 | -- | -- | 86.0 |
| | NGM MOS | | 0.5 | 3.6 | 3.3 | -- | -- | 86.3 |
| Tonight's Min | LOCAL | 4891 | -1.1 | 3.6 | 2.9 | 0.71 | 0.25 | 87.5 |
| | LFM MOS | | -1.6 | 4.0 | 4.2 | 0.75 | 0.32 | 84.7 |
| | NGM MOS | | -1.0 | 4.0 | 3.6 | 0.76 | 0.27 | 85.4 |
| Tomorrow's Max | LOCAL | 4892 | -0.7 | 4.4 | 6.4 | -- | -- | 80.0 |
| | LFM MOS | | -0.8 | 4.9 | 9.1 | -- | -- | 75.6 |
| | NGM MOS | | 0.1 | 4.8 | 8.6 | -- | -- | 76.8 |
| Tomorrow Night's Min | LOCAL | 4879 | -1.4 | 4.8 | 8.6 | 0.54 | 0.38 | 78.3 |
| | LFM MOS | | -1.4 | 5.2 | 11.6 | 0.57 | 0.38 | 73.7 |
| | NGM MOS | | -1.3 | 4.9 | 8.8 | 0.66 | 0.33 | 77.1 |



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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Tonight's Min | LOCAL | 4923 | -0.9 | 3.2 | 1.4 | 0.74 | 0.20 | 90.4 |
| | LFM MOS | | -1.3 | 3.7 | 2.9 | 0.74 | 0.25 | 87.1 |
| | NGM MOS | | -0.6 | 3.5 | 2.2 | 0.72 | 0.22 | 88.3 |
| Tomorrow's Max | LOCAL | 4926 | -0.5 | 3.9 | 4.1 | -- | -- | 84.8 |
| | LFM MOS | | -0.5 | 4.6 | 7.4 | -- | -- | 79.1 |
| | NGM MOS | | 0.7 | 4.3 | 6.0 | -- | -- | 81.4 |
| Tomorrow Night's Min | LOCAL | 4915 | -1.4 | 4.2 | 5.2 | 0.76 | 0.28 | 83.2 |
| | LFM MOS | | -1.7 | 4.7 | 8.0 | 0.72 | 0.35 | 79.1 |
| | NGM MOS | | -1.1 | 4.3 | 5.5 | 0.74 | 0.34 | 82.7 |
| Day After Tomorrow's Max | LOCAL | 4917 | -0.7 | 5.1 | 10.3 | -- | -- | 73.6 |
| | LFM MOS | | -0.7 | 5.7 | 14.5 | -- | -- | 67.6 |
| | NGM MOS | | 0.1 | 5.5 | 12.4 | -- | -- | 70.2 |

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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Today's Max | LOCAL | 2935 | -0.2 | 2.6 | 0.8 | -- | -- | 86.4 |
| | LFM MOS | | -0.8 | 3.2 | 2.1 | -- | -- | 80.4 |
| | NGM MOS | | 0.0 | 3.1 | 1.7 | -- | -- | 81.0 |
| Tonight's Min | LOCAL | 2925 | -0.6 | 3.1 | 1.3 | 0.42 | 0.41 | 77.0 |
| | LFM MOS | | -1.2 | 3.6 | 2.2 | 0.42 | 0.54 | 70.6 |
| | NGM MOS | | -0.8 | 3.4 | 2.8 | 0.47 | 0.45 | 72.2 |
| Tomorrow's Max | LOCAL | 2928 | -0.6 | 3.4 | 2.5 | -- | -- | 77.4 |
| | LFM MOS | | -0.9 | 4.1 | 5.4 | -- | -- | 67.7 |
| | NGM MOS | | -0.5 | 4.2 | 5.5 | -- | -- | 66.9 |
| Tomorrow Night's Min | LOCAL | 2917 | -0.7 | 3.7 | 3.8 | 0.26 | 0.57 | 66.9 |
| | LFM MOS | | -0.7 | 4.0 | 4.8 | 0.30 | 0.56 | 61.6 |
| | NGM MOS | | -0.9 | 3.8 | 4.3 | 0.47 | 0.53 | 65.7 |



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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Tonight's Min | LOCAL | 2973 | -0.7 | 2.8 | 1.0 | 0.49 | 0.24 | 80.9 |
| | LFM MOS | | -1.3 | 3.3 | 1.6 | 0.56 | 0.39 | 75.7 |
| | NGM MOS | | -0.4 | 3.0 | 1.2 | 0.38 | 0.32 | 79.2 |
| Tomorrow's Max | LOCAL | 2977 | -0.5 | 3.0 | 1.6 | -- | -- | 82.3 |
| | LFM MOS | | -1.1 | 3.8 | 4.1 | -- | -- | 72.9 |
| | NGM MOS | | -0.1 | 3.9 | 4.9 | -- | -- | 71.0 |
| Tomorrow Night's Min | LOCAL | 2967 | -0.8 | 3.4 | 2.3 | 0.48 | 0.45 | 71.9 |
| | LFM MOS | | -1.2 | 3.9 | 3.8 | 0.44 | 0.55 | 65.5 |
| | NGM MOS | | -0.8 | 3.7 | 3.4 | 0.54 | 0.46 | 68.4 |
| Day After Tomorrow's Max | LOCAL | 2972 | -0.8 | 3.8 | 4.0 | -- | -- | 73.5 |
| | LFM MOS | | -0.9 | 4.4 | 6.6 | -- | -- | 64.2 |
| | NGM MOS | | -0.4 | 4.4 | 6.6 | -- | -- | 64.6 |

Table 2.11. Comparative verification of local and LFM MOS max/min temperature forecasts for 5 stations in the Alaska Region, 0000 UTC cycle.

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Today's Max | LOCAL | 871 | 0.9 | 3.4 | 3.7 | -- | -- | * |
| | LFM MOS | | 1.8 | 3.7 | 4.5 | -- | -- | * |
| Tonight's Min | LOCAL | 866 | 0.6 | 5.1 | 11.9 | 0.33 | 0.50 | * |
| | LFM MOS | | -0.1 | 5.2 | 12.2 | 0.33 | 0.60 | * |
| Tomorrow's Max | LOCAL | 869 | 1.3 | 4.3 | 8.1 | -- | -- | * |
| | LFM MOS | | 2.7 | 4.6 | 9.6 | -- | -- | * |
| Tomorrow Night's Min | LOCAL | 869 | 0.9 | 6.2 | 19.2 | 0.33 | 0.67 | * |
| | LFM MOS | | 0.2 | 6.2 | 17.6 | 0.33 | 0.71 | * |

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

| Forecast Projection | Forecast Type | Number of Cases | Mean Algebraic Error (°F) | Mean Absolute Error (°F) | Percent of Absolute Errors >10°F | Probability of Detection (32°F) | False Alarm Ratio (32°F) | Improvement Over Climate |
|---|---|---|---|---|---|---|---|---|
| Tonight's Min | LOCAL | 877 | -0.5 | 4.3 | 8.4 | 0.17 | 0.80 | * |
| | LFM MOS | | -1.3 | 4.7 | 9.4 | 0.50 | 0.57 | * |
| Tomorrow's Max | LOCAL | 877 | 0.6 | 3.8 | 5.5 | -- | -- | * |
| | LFM MOS | | 1.8 | 4.0 | 6.2 | -- | -- | * |
| Tomorrow Night's Min | LOCAL | 871 | 0.0 | 5.5 | 13.7 | 0.33 | 0.75 | * |
| | LFM MOS | | -0.6 | 5.8 | 16.4 | 0.33 | 0.78 | * |
| Day After Tomorrow's Max | LOCAL | 876 | 1.1 | 4.7 | 8.2 | -- | -- | * |
| | LFM MOS | | 2.4 | 5.0 | 10.6 | -- | -- | * |
| | | | | | | -- | -- | |

* Percent improvement over climate scores were not available.

Table 3.1. Comparative verification of local, LFM MOS, and NGM MOS PoP forecasts for 94 stations in the conterminous U.S., 0000 UTC cycle.

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Changes GE 20% to Guidance: Local % Imprv. | Changes GE 20% to Guidance: No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0791 | | 49.0 | | | | |
| (1st period) | LFM MOS | 0.0868 | 8.9 | 44.0 | 16137 | 0.2385 | 20.2 | 2100 |
| | NGM MOS | 0.0832 | 5.0 | 46.3 | | 0.2105 | 10.1 | 2642 |
| 24-36 | LOCAL | 0.0921 | | 42.3 | | | | |
| (2nd period) | LFM MOS | 0.0988 | 6.8 | 38.1 | 16142 | 0.2362 | 17.0 | 2077 |
| | NGM MOS | 0.0934 | 1.4 | 41.5 | | 0.2094 | 1.6 | 2414 |
| 36-48 | LOCAL | 0.1021 | | 34.8 | | | | |
| (3rd period) | LFM MOS | 0.1091 | 6.4 | 30.3 | 16117 | 0.2432 | 17.7 | 2196 |
| | NGM MOS | 0.1030 | 0.9 | 34.2 | | 0.2132 | 0.7 | 2368 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Changes GE 20% to Guidance: Local % Imprv. | Changes GE 20% to Guidance: No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0809 | | 49.5 | | | | |
| (1st period) | LFM MOS | 0.0880 | 8.1 | 45.0 | 16272 | 0.2248 | 17.1 | 2125 |
| | NGM MOS | 0.0852 | 5.1 | 46.8 | | 0.2122 | 10.8 | 2665 |
| 24-36 | LOCAL | 0.0929 | | 40.7 | | | | |
| (2nd period) | LFM MOS | 0.0998 | 7.0 | 36.3 | 16249 | 0.2411 | 17.8 | 2118 |
| | NGM MOS | 0.0934 | 0.6 | 40.4 | | 0.2090 | 0.1 | 2583 |
| 36-48 | LOCAL | 0.1061 | | 34.0 | | | | |
| (3rd period) | LFM MOS | 0.1125 | 5.7 | 30.0 | 16253 | 0.2323 | 13.6 | 2257 |
| | NGM MOS | 0.1084 | 2.1 | 32.6 | | 0.2251 | 5.0 | 2489 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Changes GE 20% to Guidance: Local % Imprv. | Changes GE 20% to Guidance: No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0916 | | 48.7 | | | | |
| (1st period) | LFM MOS | 0.0960 | 4.6 | 46.2 | 4160 | 0.2172 | 9.2 | 666 |
| | NGM MOS | 0.0917 | 0.2 | 48.6 | | 0.1976 | -0.9 | 813 |
| 24-36 | LOCAL | 0.0979 | | 47.0 | | | | |
| (2nd period) | LFM MOS | 0.1057 | 7.3 | 42.8 | 4164 | 0.2324 | 17.3 | 660 |
| | NGM MOS | 0.0999 | 1.9 | 46.0 | | 0.1961 | 3.2 | 761 |
| 36-48 | LOCAL | 0.1107 | | 39.1 | | | | |
| (3rd period) | LFM MOS | 0.1176 | 5.9 | 35.3 | 4157 | 0.2254 | 16.4 | 690 |
| | NGM MOS | 0.1112 | 0.5 | 38.8 | | 0.1952 | -0.3 | 760 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Changes GE 20% to Guidance: Local % Imprv. | Changes GE 20% to Guidance: No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0886 | | 52.3 | | | | |
| (1st period) | LFM MOS | 0.0950 | 6.7 | 48.9 | 4204 | 0.2166 | 12.7 | 655 |
| | NGM MOS | 0.0930 | 4.7 | 50.0 | | 0.2045 | 10.6 | 802 |
| 24-36 | LOCAL | 0.1011 | | 44.0 | | | | |
| (2nd period) | LFM MOS | 0.1099 | 7.9 | 39.2 | 4199 | 0.2271 | 20.5 | 628 |
| | NGM MOS | 0.1008 | -0.3 | 44.2 | | 0.2043 | 1.5 | 827 |
| 36-48 | LOCAL | 0.1149 | | 37.6 | | | | |
| (3rd period) | LFM MOS | 0.1211 | 5.1 | 34.2 | 4201 | 0.2359 | 13.2 | 695 |
| | NGM MOS | 0.1203 | 4.5 | 34.6 | | 0.2279 | 7.6 | 833 |

Table 3.5. Comparative verification of local, LFM MOS, and NGM MOS PoP forecasts for 25 stations in the Southern Region, 0000 UTC cycle.

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Changes GE 20% to Guidance: Local % Imprv. | Changes GE 20% to Guidance: No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0724 | | 47.9 | | | | |
| (1st period) | LFM MOS | 0.0779 | 7.0 | 44.1 | 4134 | 0.2310 | 13.2 | 498 |
| | NGM MOS | 0.0774 | 6.4 | 44.4 | | 0.2172 | 10.8 | 638 |
| 24-36 | LOCAL | 0.0854 | | 39.7 | | | | |
| (2nd period) | LFM MOS | 0.0915 | 6.7 | 35.4 | 4137 | 0.2273 | 16.1 | 541 |
| | NGM MOS | 0.0887 | 3.7 | 37.4 | | 0.2391 | 7.2 | 589 |
| 36-48 | LOCAL | 0.0943 | | 32.9 | | | | |
| (3rd period) | LFM MOS | 0.1015 | 7.1 | 27.8 | 4130 | 0.2404 | 18.5 | 543 |
| | NGM MOS | 0.0973 | 3.1 | 30.8 | | 0.2396 | 5.9 | 525 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Changes GE 20% to Guidance: Local % Imprv. | Changes GE 20% to Guidance: No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0736 | | 48.5 | | | | |
| (1st period) | LFM MOS | 0.0808 | 9.0 | 43.4 | 4153 | 0.2277 | 19.8 | 529 |
| | NGM MOS | 0.0772 | 4.7 | 46.0 | | 0.2149 | 9.1 | 632 |
| 24-36 | LOCAL | 0.0860 | | 38.9 | | | | |
| (2nd period) | LFM MOS | 0.0918 | 6.4 | 34.8 | 4146 | 0.2285 | 14.6 | 528 |
| | NGM MOS | 0.0889 | 3.3 | 36.8 | | 0.2228 | 4.1 | 551 |
| 36-48 | LOCAL | 0.0963 | | 32.1 | | | | |
| (3rd period) | LFM MOS | 0.1036 | 7.1 | 26.9 | 4146 | 0.2125 | 15.7 | 586 |
| | NGM MOS | 0.0984 | 2.1 | 30.7 | | 0.2354 | 7.4 | 528 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Local % Imprv. | No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0773 | | 51.6 | | | | |
| (1st period) | LFM MOS | 0.0884 | 12.6 | 44.6 | 4902 | 0.2628 | 29.9 | 630 |
| | NGM MOS | 0.0810 | 4.6 | 49.3 | | 0.2152 | 10.3 | 769 |
| 24-36 | LOCAL | 0.0943 | | 42.8 | | | | |
| (2nd period) | LFM MOS | 0.1016 | 7.2 | 38.3 | 4901 | 0.2388 | 19.2 | 594 |
| | NGM MOS | 0.0935 | -0.8 | 43.2 | | 0.2008 | -5.2 | 700 |
| 36-48 | LOCAL | 0.1061 | | 33.8 | | | | |
| (3rd period) | LFM MOS | 0.1145 | 7.3 | 28.5 | 4896 | 0.2659 | 18.2 | 650 |
| | NGM MOS | 0.1047 | -1.4 | 34.7 | | 0.2202 | -4.3 | 715 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Local % Imprv. | No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0842 | | 49.0 | | | | |
| (1st period) | LFM MOS | 0.0919 | 8.4 | 44.3 | 4935 | 0.2263 | 19.5 | 635 |
| | NGM MOS | 0.0857 | 1.8 | 48.1 | | 0.2076 | 4.6 | 769 |
| 24-36 | LOCAL | 0.0945 | | 41.4 | | | | |
| (2nd period) | LFM MOS | 0.1029 | 8.1 | 36.2 | 4928 | 0.2610 | 20.7 | 673 |
| | NGM MOS | 0.0918 | -2.9 | 43.0 | | 0.1991 | -10.6 | 759 |
| 36-48 | LOCAL | 0.1107 | | 34.1 | | | | |
| (3rd period) | LFM MOS | 0.1184 | 6.5 | 29.5 | 4929 | 0.2493 | 16.6 | 655 |
| | NGM MOS | 0.1109 | 0.2 | 33.9 | | 0.2130 | -0.3 | 731 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Changes GE 20% to Guidance: Local % Imprv. | Changes GE 20% to Guidance: No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0737 | | 45.9 | | | | |
| (1st period) | LFM MOS | 0.0837 | 12.0 | 38.6 | 2941 | 0.2474 | 30.9 | 306 |
| | NGM MOS | 0.0832 | 11.4 | 39.0 | | 0.2165 | 27.7 | 422 |
| 24-36 | LOCAL | 0.0896 | | 36.5 | | | | |
| (2nd period) | LFM MOS | 0.0945 | 5.3 | 33.0 | 2940 | 0.2569 | 13.2 | 282 |
| | NGM MOS | 0.0906 | 1.1 | 35.7 | | 0.2054 | 0.2 | 364 |
| 36-48 | LOCAL | 0.0940 | | 31.6 | | | | |
| (3rd period) | LFM MOS | 0.0985 | 4.5 | 28.3 | 2934 | 0.2403 | 17.9 | 313 |
| | NGM MOS | 0.0964 | 2.5 | 29.8 | | 0.1992 | 4.4 | 368 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Changes GE 20% to Guidance: Local % Imprv. | Changes GE 20% to Guidance: No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 | LOCAL | 0.0751 | | 46.4 | | | | |
| (1st period) | LFM MOS | 0.0820 | 8.4 | 41.5 | 2980 | 0.2340 | 16.3 | 306 |
| | NGM MOS | 0.0849 | 11.5 | 39.5 | | 0.2294 | 22.4 | 462 |
| 24-36 | LOCAL | 0.0880 | | 36.0 | | | | |
| (2nd period) | LFM MOS | 0.0917 | 4.0 | 33.4 | 2976 | 0.2481 | 10.9 | 289 |
| | NGM MOS | 0.0917 | 4.1 | 33.3 | | 0.2178 | 9.5 | 446 |
| 36-48 | LOCAL | 0.0996 | | 30.0 | | | | |
| (3rd period) | LFM MOS | 0.1029 | 3.2 | 27.7 | 2977 | 0.2259 | 3.9 | 321 |
| | NGM MOS | 0.1013 | 1.7 | 28.8 | | 0.2278 | 5.5 | 397 |

Table 3.11. Comparative verification of local and LFM MOS PoP forecasts for 5 stations in the Alaska Region, 0000 UTC cycle.

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Local % Imprv. | No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 (1st period) | LOCAL | 0.1406 | | * | | | | |
| | LFM MOS | 0.1680 | 16.3 | * | 682 | 0.2538 | 26.4 | 241 |
| 24-36 (2nd period) | LOCAL | 0.1433 | | * | | | | |
| | LFM MOS | 0.1520 | 5.7 | * | 681 | 0.2095 | 11.2 | 236 |
| 36-48 (3rd period) | LOCAL | 0.1559 | | * | | | | |
| | LFM MOS | 0.1620 | 3.8 | * | 682 | 0.2256 | 5.2 | 219 |

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

| Forecast Projection (h) | Type of Forecast | Brier Score | Local % Imp. Over Guid. | % Imp. Over Clim. | No. of Cases | Changes GE 20% to Guidance: Guid. Brier Score | Local % Imprv. | No. of Changes |
|---|---|---|---|---|---|---|---|---|
| 12-24 (1st period) | LOCAL | 0.1375 | | * | | | | |
| | LFM MOS | 0.1534 | 10.4 | * | 684 | 0.2452 | 19.0 | 218 |
| 24-36 (2nd period) | LOCAL | 0.1465 | | * | | | | |
| | LFM MOS | 0.1676 | 12.6 | * | 688 | 0.2399 | 22.5 | 237 |
| 36-48 (3rd period) | LOCAL | 0.1536 | | * | | | | |
| | LFM MOS | 0.1507 | -1.9 | * | 686 | 0.2108 | -3.9 | 188 |

* Percent improvement over climate scores were not available.

Table 4.1. Comparative verification of local and LFM MOS PoPT forecasts for 87 stations in the conterminous U.S. for the 0000 UTC cycle. Only cases where the local PoP was ≥ 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 | LOCAL | 0.45 | 0.95 | 1.06 | 90.1 | 0.796 | 0.18 | 0.86 | 0.60 | 0.09 |
| | | MOS | 0.50 | 0.97 | 1.04 | 91.8 | 0.833 | 0.27 | 0.89 | 0.45 | 0.08 |
| | | No. Obs. | 22 | 300 | 484 | | | | | | |
| | Southern 23 | LOCAL | 0.14 | 0.74 | 1.03 | 94.8 | 0.499 | 0.14 | 0.48 | 0.00 | 0.35 |
| | | MOS | 0.43 | 1.22 | 1.00 | 93.9 | 0.529 | 0.00 | 0.70 | 1.00 | 0.43 |
| | | No. Obs. | 7 | 23 | 410 | | | | | | |
| | Central 28 | LOCAL | 0.70 | 0.93 | 1.09 | 85.7 | 0.733 | 0.32 | 0.82 | 0.54 | 0.12 |
| | | MOS | 0.40 | 1.00 | 1.07 | 86.7 | 0.749 | 0.20 | 0.87 | 0.50 | 0.13 |
| | | No. Obs. | 40 | 292 | 368 | | | | | | |
| | Western 12 | LOCAL | 0.33 | 0.84 | 1.09 | 91.7 | 0.806 | 0.33 | 0.79 | 0.00 | 0.06 |
| | | MOS | 0.00 | 0.87 | 1.08 | 87.9 | 0.718 | 0.00 | 0.75 | * | 0.14 |
| | | No. Obs. | 3 | 85 | 176 | | | | | | |
| | All Stations | LOCAL | 0.56 | 0.92 | 1.06 | 89.8 | 0.778 | 0.26 | 0.82 | 0.52 | 0.10 |
| | | MOS | 0.42 | 0.98 | 1.04 | 90.1 | 0.786 | 0.19 | 0.86 | 0.53 | 0.12 |
| | | No. Obs. | 72 | 700 | 1438 | | | | | | |
| 30 | Eastern 24 | LOCAL | 0.22 | 1.05 | 1.00 | 88.8 | 0.776 | 0.17 | 0.89 | 0.20 | 0.15 |
| | | MOS | 1.09 | 0.95 | 1.03 | 90.0 | 0.803 | 0.30 | 0.88 | 0.72 | 0.08 |
| | | No. Obs. | 23 | 314 | 476 | | | | | | |
| | Southern 22 | LOCAL | 0.60 | 0.93 | 1.01 | 97.1 | 0.645 | 0.20 | 0.71 | 0.67 | 0.23 |
| | | MOS | 4.20 | 0.57 | 0.97 | 94.7 | 0.523 | 0.80 | 0.43 | 0.81 | 0.25 |
| | | No. Obs. | 5 | 14 | 392 | | | | | | |
| | Central 28 | LOCAL | 0.36 | 1.09 | 1.00 | 84.5 | 0.711 | 0.20 | 0.89 | 0.44 | 0.18 |
| | | MOS | 0.64 | 0.98 | 1.06 | 85.6 | 0.734 | 0.30 | 0.86 | 0.54 | 0.13 |
| | | No. Obs. | 44 | 309 | 368 | | | | | | |
| | Western 12 | LOCAL | 3.00 | 1.00 | 0.99 | 90.3 | 0.777 | 0.00 | 0.86 | 1.00 | 0.14 |
| | | MOS | 0.00 | 0.87 | 1.06 | 93.4 | 0.839 | 0.00 | 0.83 | * | 0.05 |
| | | No. Obs. | 1 | 69 | 157 | | | | | | |
| | All Stations | LOCAL | 0.37 | 1.06 | 1.00 | 89.1 | 0.770 | 0.19 | 0.88 | 0.48 | 0.17 |
| | | MOS | 1.01 | 0.95 | 1.03 | 89.8 | 0.786 | 0.33 | 0.85 | 0.68 | 0.10 |
| | | No. Obs. | 73 | 706 | 1393 | | | | | | |
| 42 | Eastern 24 | LOCAL | 0.50 | 1.07 | 0.98 | 88.3 | 0.764 | 0.25 | 0.89 | 0.50 | 0.17 |
| | | MOS | 0.60 | 1.10 | 0.95 | 89.4 | 0.788 | 0.30 | 0.92 | 0.50 | 0.16 |
| | | No. Obs. | 20 | 306 | 483 | | | | | | |
| | Southern 23 | LOCAL | 0.00 | 0.53 | 1.03 | 95.6 | 0.451 | 0.00 | 0.37 | * | 0.30 |
| | | MOS | 2.00 | 0.84 | 1.00 | 93.8 | 0.428 | 0.00 | 0.47 | 1.00 | 0.44 |
| | | No. Obs. | 3 | 19 | 366 | | | | | | |
| | Central 28 | LOCAL | 0.29 | 1.09 | 1.00 | 83.0 | 0.681 | 0.11 | 0.88 | 0.64 | 0.20 |
| | | MOS | 0.50 | 1.10 | 0.98 | 81.9 | 0.662 | 0.13 | 0.87 | 0.74 | 0.21 |
| | | No. Obs. | 38 | 282 | 352 | | | | | | |
| | Western 12 | LOCAL | 0.67 | 0.90 | 1.05 | 88.1 | 0.721 | 0.00 | 0.77 | 1.00 | 0.14 |
| | | MOS | 0.33 | 0.84 | 1.08 | 85.7 | 0.658 | 0.00 | 0.70 | 1.00 | 0.17 |
| | | No. Obs. | 3 | 77 | 172 | | | | | | |
| | All Stations | LOCAL | 0.36 | 1.04 | 1.01 | 87.9 | 0.742 | 0.14 | 0.86 | 0.61 | 0.18 |
| | | MOS | 0.59 | 1.06 | 0.99 | 87.4 | 0.734 | 0.17 | 0.86 | 0.71 | 0.19 |
| | | No. Obs. | 64 | 684 | 1373 | | | | | | |

* This category was observed but was not forecast.

Table 4.2. Same as Table 4.1 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 | LOCAL | 0.68 | 1.01 | 1.01 | 90.0 | 0.803 | 0.16 | 0.90 | 0.76 | 0.11 |
| | | MOS | 0.96 | 0.95 | 1.04 | 91.8 | 0.839 | 0.52 | 0.89 | 0.46 | 0.06 |
| | | No. Obs. | 25 | 324 | 483 | | | | | | |
| | Southern 22 | LOCAL | 0.80 | 1.19 | 1.00 | 96.8 | 0.668 | 0.20 | 0.75 | 0.75 | 0.37 |
| | | MOS | 2.60 | 0.69 | 0.99 | 94.9 | 0.492 | 0.40 | 0.50 | 0.85 | 0.27 |
| | | No. Obs. | 5 | 16 | 412 | | | | | | |
| | Central 28 | LOCAL | 0.69 | 0.97 | 1.06 | 85.9 | 0.738 | 0.29 | 0.85 | 0.59 | 0.12 |
| | | MOS | 0.64 | 0.95 | 1.09 | 87.1 | 0.760 | 0.33 | 0.86 | 0.48 | 0.10 |
| | | No. Obs. | 42 | 311 | 375 | | | | | | |
| | Western 12 | LOCAL | 2.00 | 1.06 | 0.97 | 90.4 | 0.774 | 0.00 | 0.87 | 1.00 | 0.18 |
| | | MOS | 0.00 | 0.90 | 1.05 | 93.7 | 0.844 | 0.00 | 0.84 | * | 0.06 |
| | | No. Obs. | 1 | 69 | 169 | | | | | | |
| | All Stations | LOCAL | 0.71 | 1.00 | 1.01 | 90.0 | 0.789 | 0.23 | 0.88 | 0.67 | 0.13 |
| | | MOS | 0.88 | 0.94 | 1.04 | 91.1 | 0.810 | 0.40 | 0.86 | 0.55 | 0.08 |
| | | No. Obs. | 73 | 720 | 1439 | | | | | | |
| 30 | Eastern 24 | LOCAL | 0.32 | 1.05 | 1.00 | 89.2 | 0.780 | 0.00 | 0.91 | 1.00 | 0.14 |
| | | MOS | 0.50 | 1.01 | 1.02 | 90.6 | 0.808 | 0.23 | 0.90 | 0.55 | 0.11 |
| | | No. Obs. | 22 | 297 | 485 | | | | | | |
| | Southern 23 | LOCAL | 0.40 | 0.78 | 1.02 | 95.4 | 0.493 | 0.20 | 0.44 | 0.50 | 0.43 |
| | | MOS | 3.40 | 1.11 | 0.96 | 92.5 | 0.455 | 0.40 | 0.61 | 0.88 | 0.45 |
| | | No. Obs. | 5 | 18 | 389 | | | | | | |
| | Central 28 | LOCAL | 0.57 | 1.04 | 1.02 | 85.2 | 0.725 | 0.24 | 0.88 | 0.58 | 0.16 |
| | | MOS | 1.07 | 1.05 | 0.95 | 82.9 | 0.691 | 0.31 | 0.88 | 0.71 | 0.17 |
| | | No. Obs. | 42 | 288 | 367 | | | | | | |
| | Western 12 | LOCAL | 0.00 | 1.00 | 1.01 | 89.3 | 0.756 | 0.00 | 0.84 | * | 0.16 |
| | | MOS | 0.50 | 0.80 | 1.10 | 88.5 | 0.725 | 0.50 | 0.72 | 0.00 | 0.09 |
| | | No. Obs. | 2 | 80 | 170 | | | | | | |
| | All Stations | LOCAL | 0.46 | 1.03 | 1.01 | 89.1 | 0.767 | 0.15 | 0.87 | 0.67 | 0.16 |
| | | MOS | 1.04 | 1.00 | 1.00 | 88.2 | 0.753 | 0.30 | 0.86 | 0.72 | 0.14 |
| | | No. Obs. | 71 | 683 | 1411 | | | | | | |
| 42 | Eastern 24 | LOCAL | 0.38 | 1.10 | 0.97 | 86.9 | 0.740 | 0.08 | 0.90 | 0.78 | 0.19 |
| | | MOS | 1.04 | 1.01 | 0.99 | 88.6 | 0.775 | 0.38 | 0.89 | 0.64 | 0.12 |
| | | No. Obs. | 24 | 293 | 464 | | | | | | |
| | Southern 22 | LOCAL | 0.60 | 1.00 | 1.01 | 95.8 | 0.512 | 0.20 | 0.54 | 0.67 | 0.46 |
| | | MOS | 3.20 | 0.38 | 0.99 | 92.9 | 0.282 | 0.20 | 0.23 | 0.94 | 0.40 |
| | | No. Obs. | 5 | 13 | 363 | | | | | | |
| | Central 28 | LOCAL | 0.49 | 1.12 | 0.96 | 80.6 | 0.643 | 0.16 | 0.87 | 0.67 | 0.23 |
| | | MOS | 1.37 | 0.98 | 0.97 | 80.9 | 0.660 | 0.30 | 0.84 | 0.78 | 0.14 |
| | | No. Obs. | 43 | 295 | 359 | | | | | | |
| | Western 12 | LOCAL | 0.00 | 1.03 | 1.00 | 89.0 | 0.739 | 0.00 | 0.83 | * | 0.20 |
| | | MOS | 0.50 | 0.89 | 1.05 | 89.0 | 0.730 | 0.00 | 0.76 | 1.00 | 0.14 |
| | | No. Obs. | 2 | 63 | 154 | | | | | | |
| | All Stations | LOCAL | 0.45 | 1.10 | 0.98 | 86.7 | 0.722 | 0.14 | 0.87 | 0.70 | 0.21 |
| | | MOS | 1.36 | 0.97 | 0.99 | 86.9 | 0.730 | 0.31 | 0.84 | 0.77 | 0.13 |
| | | No. Obs. | 74 | 664 | 1340 | | | | | | |

* This category was observed but was not forecast.

Table 5.1. Comparative verification of local and LFM MOS snow amount forecasts for 85 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 | LOCAL | 1.73 | 1.28 | 1.31 | 98.2 | 0.295 | 0.236 | 0.112 | 0.111 | 0.52 | 0.23 | 0.23 | 0.70 | 0.82 | 0.82 |
| | MOS | 1.02 | 0.64 | 0.31 | 98.5 | 0.223 | 0.177 | 0.049 | 0.063 | 0.30 | 0.08 | 0.08 | 0.70 | 0.88 | 0.75 |
| | No. Obs. | 138 | 39 | 13 | | | | | | | | | | | |
| 1200 | LOCAL | 1.31 | 0.99 | 0.96 | 98.0 | 0.351 | 0.307 | 0.202 | 0.250 | 0.54 | 0.33 | 0.39 | 0.59 | 0.66 | 0.59 |
| | MOS | 0.79 | 0.58 | 0.32 | 98.3 | 0.284 | 0.237 | 0.172 | 0.121 | 0.34 | 0.23 | 0.14 | 0.57 | 0.60 | 0.56 |
| | No. Obs. | 192 | 69 | 28 | | | | | | | | | | | |

Table 6.1. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 95 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 | LOCAL | 0.76 | 1.50 | 1.66 | 0.93 | 68.5 | 0.551 |
| | LFM MOS | 0.95 | 1.48 | 1.19 | 0.87 | 62.0 | 0.448 |
| | NGM MOS | 0.87 | 1.51 | 1.26 | 0.91 | 62.6 | 0.459 |
| | No. Obs. | 6087 | 1902 | 1572 | 6679 | | |
| 18 | LOCAL | 0.57 | 1.69 | 2.15 | 0.74 | 52.1 | 0.363 |
| | LFM MOS | 0.81 | 1.77 | 1.36 | 0.75 | 54.3 | 0.377 |
| | NGM MOS | 0.72 | 1.85 | 1.45 | 0.77 | 53.7 | 0.371 |
| | No. Obs. | 5427 | 2507 | 2000 | 6456 | | |
| 24 | LOCAL | 0.59 | 1.71 | 2.24 | 0.75 | 49.6 | 0.328 |
| | LFM MOS | 0.83 | 1.70 | 1.38 | 0.76 | 54.1 | 0.368 |
| | NGM MOS | 0.76 | 1.81 | 1.51 | 0.75 | 53.7 | 0.368 |
| | No. Obs. | 5766 | 2510 | 1751 | 6201 | | |

Table 6.2. Same as Table 6.1 except for 94 stations for the 1200 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.74 | 1.32 | 1.85 | 0.87 | 62.7 | 0.486 |
| | LFM MOS | 0.87 | 1.67 | 1.43 | 0.73 | 55.7 | 0.390 |
| | NGM MOS | 0.80 | 1.64 | 1.44 | 0.81 | 56.8 | 0.405 |
| | No. Obs. | 5761 | 2525 | 1748 | 6309 | | |
| 18 | LOCAL | 0.63 | 1.81 | 2.30 | 0.86 | 56.4 | 0.397 |
| | LFM MOS | 0.97 | 1.57 | 1.19 | 0.82 | 60.8 | 0.426 |
| | NGM MOS | 0.89 | 1.72 | 1.35 | 0.82 | 60.2 | 0.425 |
| | No. Obs. | 6733 | 1835 | 1434 | 6348 | | |
| 24 | LOCAL | 0.61 | 1.85 | 2.12 | 0.85 | 52.6 | 0.345 |
| | LFM MOS | 0.93 | 1.62 | 1.20 | 0.84 | 58.6 | 0.403 |
| | NGM MOS | 0.85 | 1.77 | 1.30 | 0.85 | 58.3 | 0.404 |
| | No. Obs. | 6099 | 1914 | 1564 | 6770 | | |

Table 6.3. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 24 stations in the Eastern Region, 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.72 | 1.32 | 1.65 | 0.90 | 62.8 | 0.468 |
| | LFM MOS | 0.83 | 1.33 | 1.40 | 0.89 | 58.5 | 0.403 |
| | NGM MOS | 0.77 | 1.38 | 1.20 | 0.96 | 59.5 | 0.410 |
| | No. Obs. | 1111 | 612 | 471 | 1954 | | |
| 18 | LOCAL | 0.42 | 1.56 | 2.31 | 0.74 | 50.7 | 0.332 |
| | LFM MOS | 0.70 | 1.60 | 1.55 | 0.79 | 53.3 | 0.354 |
| | NGM MOS | 0.62 | 1.73 | 1.62 | 0.77 | 52.4 | 0.346 |
| | No. Obs. | 1038 | 678 | 538 | 1889 | | |
| 24 | LOCAL | 0.53 | 1.90 | 2.34 | 0.77 | 50.6 | 0.325 |
| | LFM MOS | 0.79 | 1.71 | 1.44 | 0.85 | 54.9 | 0.358 |
| | NGM MOS | 0.76 | 1.94 | 1.51 | 0.79 | 54.3 | 0.360 |
| | No. Obs. | 1300 | 533 | 419 | 1889 | | |

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

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.62 | 1.52 | 2.09 | 0.88 | 59.8 | 0.432 |
| | LFM MOS | 0.82 | 1.75 | 1.52 | 0.81 | 55.9 | 0.376 |
| | NGM MOS | 0.77 | 1.81 | 1.57 | 0.82 | 56.7 | 0.389 |
| | No. Obs. | 1309 | 529 | 413 | 1910 | | |
| 18 | LOCAL | 0.58 | 1.73 | 2.36 | 0.88 | 55.6 | 0.372 |
| | LFM MOS | 0.91 | 1.50 | 1.26 | 0.90 | 60.7 | 0.417 |
| | NGM MOS | 0.88 | 1.70 | 1.27 | 0.88 | 60.5 | 0.421 |
| | No. Obs. | 1427 | 443 | 374 | 1920 | | |
| 24 | LOCAL | 0.65 | 1.34 | 1.95 | 0.87 | 53.1 | 0.334 |
| | LFM MOS | 0.75 | 1.49 | 1.38 | 0.90 | 55.1 | 0.352 |
| | NGM MOS | 0.75 | 1.56 | 1.32 | 0.89 | 55.4 | 0.358 |
| | No. Obs. | 1099 | 613 | 464 | 1990 | | |

Table 6.5. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 25 stations in the Southern Region, 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.74 | 1.68 | 1.50 | 0.94 | 68.4 | 0.556 |
| | LFM MOS | 0.96 | 1.46 | 0.95 | 0.92 | 63.1 | 0.460 |
| | NGM MOS | 0.92 | 1.51 | 1.15 | 0.89 | 63.6 | 0.473 |
| | No. Obs. | 1729 | 470 | 445 | 1472 | | |
| 18 | LOCAL | 0.58 | 1.77 | 1.89 | 0.71 | 50.7 | 0.352 |
| | LFM MOS | 0.87 | 1.57 | 1.14 | 0.80 | 56.9 | 0.411 |
| | NGM MOS | 0.85 | 1.61 | 1.11 | 0.82 | 57.0 | 0.412 |
| | No. Obs. | 1607 | 694 | 611 | 1370 | | |
| 24 | LOCAL | 0.60 | 1.73 | 1.96 | 0.72 | 47.9 | 0.311 |
| | LFM MOS | 0.85 | 1.62 | 1.23 | 0.75 | 54.5 | 0.376 |
| | NGM MOS | 0.86 | 1.57 | 1.28 | 0.75 | 55.1 | 0.384 |
| | No. Obs. | 1607 | 708 | 513 | 1289 | | |

Table 6.6. Same as Table 6.5 except for 24 stations for the 1200 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.73 | 1.35 | 1.75 | 0.85 | 63.8 | 0.510 |
| | LFM MOS | 0.89 | 1.61 | 1.26 | 0.71 | 56.4 | 0.402 |
| | NGM MOS | 0.90 | 1.45 | 1.13 | 0.83 | 58.5 | 0.424 |
| | No. Obs. | 1604 | 711 | 510 | 1310 | | |
| 18 | LOCAL | 0.61 | 1.99 | 2.26 | 0.86 | 54.9 | 0.382 |
| | LFM MOS | 0.97 | 1.45 | 1.22 | 0.82 | 62.7 | 0.444 |
| | NGM MOS | 0.94 | 1.52 | 1.20 | 0.84 | 63.6 | 0.460 |
| | No. Obs. | 1925 | 485 | 365 | 1361 | | |
| 24 | LOCAL | 0.58 | 2.22 | 1.86 | 0.85 | 50.1 | 0.324 |
| | LFM MOS | 0.93 | 1.62 | 1.02 | 0.88 | 59.8 | 0.417 |
| | NGM MOS | 0.91 | 1.68 | 1.09 | 0.86 | 61.7 | 0.448 |
| | No. Obs. | 1721 | 472 | 440 | 1499 | | |

Table 6.7. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 28 stations in the Central Region, 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.69 | 1.63 | 2.06 | 0.93 | 67.6 | 0.530 |
| | LFM MOS | 0.99 | 1.62 | 1.12 | 0.84 | 63.2 | 0.452 |
| | NGM MOS | 0.86 | 1.60 | 1.37 | 0.91 | 64.0 | 0.466 |
| | No. Obs. | 1829 | 517 | 362 | 2141 | | |
| 18 | LOCAL | 0.48 | 2.02 | 2.20 | 0.77 | 51.8 | 0.351 |
| | LFM MOS | 0.76 | 2.23 | 1.37 | 0.70 | 52.2 | 0.347 |
| | NGM MOS | 0.65 | 2.32 | 1.48 | 0.73 | 52.4 | 0.354 |
| | No. Obs. | 1556 | 655 | 527 | 2103 | | |
| 24 | LOCAL | 0.46 | 1.91 | 2.58 | 0.79 | 48.3 | 0.306 |
| | LFM MOS | 0.78 | 2.03 | 1.35 | 0.75 | 53.0 | 0.349 |
| | NGM MOS | 0.69 | 2.05 | 1.62 | 0.75 | 54.2 | 0.371 |
| | No. Obs. | 1674 | 704 | 439 | 2026 | | |

Table 6.8. Same as Table 6.7 except for the 1200 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.70 | 1.37 | 1.92 | 0.92 | 63.8 | 0.490 |
| | LFM MOS | 0.86 | 1.80 | 1.45 | 0.74 | 55.4 | 0.379 |
| | NGM MOS | 0.72 | 1.85 | 1.56 | 0.81 | 56.5 | 0.395 |
| | No. Obs. | 1672 | 712 | 450 | 2078 | | |
| 18 | LOCAL | 0.59 | 1.99 | 2.47 | 0.87 | 57.0 | 0.399 |
| | LFM MOS | 1.02 | 1.74 | 1.14 | 0.78 | 60.0 | 0.409 |
| | NGM MOS | 0.90 | 1.88 | 1.50 | 0.79 | 59.4 | 0.412 |
| | No. Obs. | 1923 | 515 | 381 | 2095 | | |
| 24 | LOCAL | 0.52 | 2.20 | 2.58 | 0.86 | 52.2 | 0.336 |
| | LFM MOS | 1.00 | 1.74 | 1.17 | 0.79 | 59.8 | 0.406 |
| | NGM MOS | 0.85 | 1.86 | 1.58 | 0.82 | 58.5 | 0.397 |
| | No. Obs. | 1856 | 523 | 366 | 2166 | | |

Table 6.9. Comparative verification of local, LFM MOS, and NGM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 18 stations in the Western Region, 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.88 | 1.37 | 1.41 | 0.94 | 77.5 | 0.666 |
| | LFM MOS | 0.98 | 1.55 | 1.27 | 0.80 | 63.2 | 0.451 |
| | NGM MOS | 0.91 | 1.60 | 1.37 | 0.85 | 63.1 | 0.456 |
| | No. Obs. | 1418 | 303 | 294 | 1112 | | |
| 18 | LOCAL | 0.79 | 1.33 | 2.29 | 0.71 | 56.4 | 0.407 |
| | LFM MOS | 0.90 | 1.65 | 1.47 | 0.69 | 55.5 | 0.384 |
| | NGM MOS | 0.73 | 1.71 | 1.75 | 0.77 | 52.7 | 0.355 |
| | No. Obs. | 1226 | 480 | 324 | 1094 | | |
| 24 | LOCAL | 0.81 | 1.27 | 2.10 | 0.66 | 52.5 | 0.362 |
| | LFM MOS | 0.94 | 1.37 | 1.55 | 0.65 | 54.1 | 0.372 |
| | NGM MOS | 0.71 | 1.67 | 1.70 | 0.70 | 50.2 | 0.334 |
| | No. Obs. | 1185 | 565 | 380 | 997 | | |

Table 6.10. Same as Table 6.9 except for the 1200 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.93 | 1.05 | 1.67 | 0.80 | 63.3 | 0.495 |
| | LFM MOS | 0.92 | 1.52 | 1.52 | 0.60 | 54.8 | 0.385 |
| | NGM MOS | 0.80 | 1.47 | 1.59 | 0.74 | 55.3 | 0.394 |
| | No. Obs. | 1176 | 573 | 375 | 1011 | | |
| 18 | LOCAL | 0.77 | 1.45 | 2.10 | 0.81 | 58.7 | 0.420 |
| | LFM MOS | 0.98 | 1.59 | 1.12 | 0.76 | 60.0 | 0.412 |
| | NGM MOS | 0.84 | 1.79 | 1.46 | 0.77 | 56.7 | 0.383 |
| | No. Obs. | 1458 | 392 | 314 | 972 | | |
| 24 | LOCAL | 0.72 | 1.72 | 2.22 | 0.84 | 55.7 | 0.376 |
| | LFM MOS | 0.97 | 1.65 | 1.20 | 0.80 | 60.2 | 0.408 |
| | NGM MOS | 0.83 | 2.13 | 1.24 | 0.84 | 57.5 | 0.386 |
| | No. Obs. | 1423 | 306 | 294 | 1115 | | |

Table 6.11. Comparative verification of local and LFM MOS forecasts of four categories of cloud amount (clear, scattered, broken, and overcast) for 6 stations in the Alaska Region, 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.77 | 1.01 | 1.63 | 0.99 | 63.1 | 0.418 |
| | LFM MOS | 0.96 | 0.92 | 0.77 | 1.08 | 65.1 | 0.424 |
| | No. Obs. | 266 | 114 | 104 | 567 | | |
| 18 | LOCAL | 0.57 | 1.28 | 1.83 | 0.96 | 55.8 | 0.326 |
| | LFM MOS | 0.81 | 0.78 | 1.01 | 1.13 | 62.6 | 0.387 |
| | No. Obs. | 254 | 116 | 121 | 556 | | |
| 24 | LOCAL | 0.54 | 1.26 | 1.87 | 0.93 | 52.0 | 0.277 |
| | LFM MOS | 0.84 | 0.84 | 0.69 | 1.18 | 60.6 | 0.348 |
| | No. Obs. | 239 | 119 | 137 | 557 | | |

Table 6.12. Same as Table 6.11 except for the 1200 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|
| 12 | LOCAL | 0.79 | 1.03 | 1.56 | 0.95 | 63.5 | 0.443 |
| | LFM MOS | 0.96 | 0.81 | 1.15 | 1.02 | 62.4 | 0.408 |
| | No. Obs. | 241 | 123 | 135 | 556 | | |
| 18 | LOCAL | 0.56 | 1.26 | 2.14 | 0.97 | 56.8 | 0.337 |
| | LFM MOS | 0.84 | 1.09 | 0.83 | 1.10 | 64.6 | 0.419 |
| | No. Obs. | 288 | 100 | 103 | 555 | | |
| 24 | LOCAL | 0.52 | 1.17 | 2.38 | 0.94 | 51.3 | 0.259 |
| | LFM MOS | 0.89 | 0.81 | 0.87 | 1.11 | 63.8 | 0.397 |
| | No. Obs. | 272 | 110 | 105 | 567 | | |

Table 7.1. Comparative verification of LFM and NGM MOS surface wind forecasts for 95 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 | LFM | 20 | 0.568 | 2891 | 3.3 | 0.9 | 2902 | 0.421 | 88.6 | 0.05 | 1.02 | 0.86 | 0.87 | 0.85 | 0.13 | 1.00 |
| | NGM | 19 | 0.569 | | 3.5 | 1.8 | | 0.432 | 87.4 | 0.07 | 0.98 | 1.08 | 1.15 | 1.52 | 1.25 | 4.00 |
| | | | | | | | | | | | 14157 | 1439 | 347 | 65 | 16 | 2 |
| 18 | LFM | 22 | 0.494 | 5434 | 3.2 | 0.3 | 5443 | 0.378 | 77.0 | 0.21 | 1.07 | 0.80 | 0.77 | 0.83 | 0.93 | 0.75 |
| | NGM | 20 | 0.522 | | 3.3 | 1.3 | | 0.414 | 76.4 | 0.20 | 1.00 | 0.94 | 1.10 | 1.34 | 1.59 | 4.75 |
| | | | | | | | | | | | 12084 | 2979 | 841 | 174 | 29 | 4 |
| 24 | LFM | 24 | 0.489 | 3414 | 3.5 | 0.8 | 3429 | 0.345 | 84.0 | 0.07 | 1.04 | 0.79 | 0.75 | 0.52 | 0.54 | 0.50 |
| | NGM | 22 | 0.506 | | 3.8 | 1.9 | | 0.368 | 82.5 | 0.08 | 0.99 | 0.98 | 1.17 | 1.46 | 1.17 | 2.75 |
| | | | | | | | | | | | 13396 | 1909 | 432 | 99 | 24 | 4 |



Table 7.2. Same as Table 7.1 except for 94 stations 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 | LFM | 22 | 0.511 | 3692 | 3.2 | 0.7 | 3703 | 0.385 | 84.7 | 0.08 | 1.03 | 0.83 | 0.79 | 0.67 | 0.46 | 0.75 |
| | NGM | 21 | 0.533 | | 3.6 | 1.7 | | 0.393 | 83.1 | 0.09 | 0.99 | 1.03 | 1.16 | 1.21 | 1.46 | 3.25 |
| | | | | | | | | | | | 13479 | 1911 | 435 | 100 | 24 | 4 |
| 18 | LFM | 21 | 0.536 | 2820 | 3.4 | 0.8 | 2838 | 0.370 | 87.6 | 0.09 | 1.03 | 0.82 | 0.77 | 0.57 | 0.54 | 0.25 |
| | NGM | 19 | 0.575 | | 3.7 | 1.8 | | 0.405 | 86.4 | 0.13 | 0.98 | 1.11 | 1.17 | 1.31 | 1.46 | 1.75 |
| | | | | | | | | | | | 14145 | 1487 | 351 | 67 | 13 | 4 |
| 24 | LFM | 22 | 0.544 | 2566 | 3.5 | 0.7 | 2579 | 0.350 | 87.9 | 0.00 | 1.03 | 0.76 | 0.67 | 0.72 | 0.06 | 0.50 |
| | NGM | 20 | 0.561 | | 3.8 | 1.8 | | 0.390 | 86.7 | 0.05 | 0.99 | 1.06 | 1.11 | 1.33 | 1.38 | 2.50 |
| | | | | | | | | | | | 14258 | 1441 | 351 | 64 | 16 | 2 |

Table 7.3. Comparative verification of LFM and NGM MOS surface wind forecasts for 24 stations in the Eastern Region, 0000 UTC cycle.

| 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 | LFM | 22 | 0.499 | 825 | 3.1 | 0.7 | 826 | 0.434 | 87.8 | 0.00 | 1.03 | 0.81 | 0.78 | 1.00 | 0.00 | * |
| | NGM | 19 | 0.502 | | 3.4 | 1.5 | | 0.449 | 86.6 | 0.00 | 0.99 | 1.08 | 1.02 | 1.64 | 0.20 | * |
| | | | | | | | | | | | 3533 | 409 | 113 | 11 | 5 | 0 |
| 18 | LFM | 23 | 0.426 | 1609 | 3.1 | 0.3 | 1611 | 0.385 | 75.7 | 0.17 | 1.05 | 0.90 | 0.73 | 0.66 | 0.50 | ** |
| | NGM | 21 | 0.452 | | 3.1 | 1.0 | | 0.416 | 75.4 | 0.13 | 1.00 | 1.01 | 0.98 | 1.21 | 1.25 | * |
| | | | | | | | | | | | 2982 | 793 | 246 | 38 | 4 | 0 |
| 24 | LFM | 23 | 0.447 | 866 | 3.4 | 0.7 | 869 | 0.367 | 84.7 | 0.07 | 1.04 | 0.82 | 0.76 | 0.38 | 0.75 | 0.00 |
| | NGM | 20 | 0.506 | | 3.7 | 1.4 | | 0.389 | 83.7 | 0.00 | 1.00 | 1.00 | 0.96 | 1.35 | 0.25 | 1.00 |
| | | | | | | | | | | | 3418 | 465 | 112 | 26 | 8 | 1 |

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

| 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 | LFM | 21 | 0.475 | 889 | 3.2 | 0.6 | 891 | 0.390 | 85.6 | 0.00 | 1.04 | 0.83 | 0.71 | 0.56 | 0.25 | 1.00 |
| | NGM | 19 | 0.502 | | 3.4 | 1.3 | | 0.408 | 84.4 | 0.00 | 0.99 | 1.06 | 0.96 | 0.88 | 0.75 | 0.00 |
| | | | | | | | | | | | 3443 | 456 | 108 | 25 | 8 | 1 |
| 18 | LFM | 23 | 0.471 | 810 | 3.1 | 0.8 | 813 | 0.415 | 87.6 | 0.00 | 1.02 | 0.86 | 0.91 | 0.76 | 0.40 | * |
| | NGM | 19 | 0.542 | | 3.3 | 1.4 | | 0.422 | 86.2 | 0.00 | 0.98 | 1.16 | 1.19 | 0.76 | 0.00 | * |
| | | | | | | | | | | | 3574 | 400 | 90 | 17 | 5 | 0 |
| 24 | LFM | 23 | 0.492 | 778 | 3.4 | 0.8 | 781 | 0.384 | 86.9 | 0.00 | 1.03 | 0.81 | 0.75 | 1.27 | 0.20 | * |
| | NGM | 20 | 0.539 | | 3.5 | 1.3 | | 0.411 | 86.0 | 0.17 | 0.99 | 1.08 | 0.89 | 1.18 | 0.40 | * |
| | | | | | | | | | | | 3566 | 411 | 110 | 11 | 5 | 0 |

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

Table 7.5. Comparative verification of LFM and NGM MOS surface wind forecasts for 25 stations in the Southern Region, 0000 UTC cycle.

| 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 | LFM | 22 | 0.578 | 520 | 3.4 | 1.4 | 522 | 0.404 | 91.8 | 0.00 | 1.00 | 1.00 | 1.03 | 1.00 | 0.00 | * |
| | NGM | 19 | 0.582 | | 3.3 | 1.5 | | 0.410 | 91.9 | 0.00 | 1.00 | 1.00 | 1.03 | 1.00 | 0.33 | * |
| | | | | | | | | | | | 3750 | 251 | 37 | 6 | 3 | 0 |
| 18 | LFM | 24 | 0.483 | 1299 | 3.3 | 0.8 | 1303 | 0.325 | 77.3 | 0.00 | 1.03 | 0.89 | 0.88 | 1.19 | 0.67 | * |
| | NGM | 21 | 0.527 | | 3.1 | 0.9 | | 0.386 | 79.2 | 0.33 | 1.02 | 0.91 | 0.85 | 1.24 | 1.33 | ** |
| | | | | | | | | | | | 3285 | 709 | 160 | 21 | 3 | 0 |
| 24 | LFM | 26 | 0.489 | 680 | 3.5 | 1.2 | 683 | 0.301 | 87.6 | 0.00 | 1.02 | 0.91 | 0.65 | 0.00 | 1.00 | * |
| | NGM | 23 | 0.527 | | 3.5 | 1.7 | | 0.347 | 87.8 | 0.00 | 1.01 | 0.93 | 1.07 | 1.00 | 1.00 | * |
| | | | | | | | | | | | 3586 | 354 | 54 | 10 | 1 | 0 |

Table 7.6. Same as Table 7.5 except for 24 stations for the 1200 UTC cycle.

| 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 | LFM | 24 | 0.513 | 759 | 3.3 | 1.3 | 762 | 0.382 | 88.7 | 0.00 | 1.01 | 0.91 | 0.91 | 0.50 | 0.00 | * |
| | NGM | 21 | 0.580 | | 3.4 | 1.7 | | 0.386 | 87.9 | 0.00 | 0.99 | 1.06 | 1.05 | 0.67 | 3.00 | * |
| | | | | | | | | | | | 3584 | 357 | 55 | 12 | 1 | 0 |
| 18 | LFM | 24 | 0.502 | 554 | 3.8 | 1.6 | 560 | 0.308 | 89.2 | 0.00 | 1.00 | 1.03 | 0.80 | 1.00 | 0.00 | * |
| | NGM | 21 | 0.522 | | 3.5 | 1.6 | | 0.403 | 90.6 | 0.00 | 1.00 | 1.05 | 0.67 | 2.33 | 0.00 | ** |
| | | | | | | | | | | | 3685 | 274 | 64 | 3 | 1 | 0 |
| 24 | LFM | 25 | 0.492 | 461 | 3.6 | 1.1 | 465 | 0.339 | 91.4 | 0.00 | 1.01 | 0.95 | 0.56 | 0.17 | 0.00 | * |
| | NGM | 22 | 0.545 | | 3.6 | 1.5 | | 0.379 | 91.8 | 0.00 | 1.01 | 0.90 | 0.85 | 1.50 | 0.33 | * |
| | | | | | | | | | | | 3753 | 250 | 41 | 6 | 3 | 0 |

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

Table 7.7. Comparative verification of LFM and NGM MOS surface wind forecasts for 28 stations in the Central 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 | LFM | 16 | 0.623 | 1169 | 3.1 | 0.5 | 1172 | 0.427 | 85.1 | 0.08 | 1.04 | 0.78 | 0.92 | 0.83 | 0.29 | 1.00 |
| | NGM | 16 | 0.617 | | 3.7 | 2.1 | | 0.414 | 81.9 | 0.09 | 0.96 | 1.10 | 1.38 | 1.86 | 2.57 | 4.00 |
| | | | | | | | | | | | 3997 | 589 | 142 | 36 | 7 | 2 |
| 18 | LFM | 20 | 0.534 | 2031 | 3.1 | -0.2 | 2032 | 0.389 | 72.2 | 0.24 | 1.14 | 0.71 | 0.77 | 0.78 | 0.88 | 1.00 |
| | NGM | 18 | 0.561 | | 3.3 | 1.7 | | 0.406 | 69.4 | 0.18 | 0.96 | 0.93 | 1.37 | 1.52 | 1.94 | 7.50 |
| | | | | | | | | | | | 3135 | 1171 | 336 | 85 | 17 | 2 |
| 24 | LFM | 21 | 0.554 | 1212 | 3.3 | 0.2 | 1216 | 0.344 | 80.8 | 0.10 | 1.09 | 0.67 | 0.63 | 0.73 | 0.29 | 1.00 |
| | NGM | 20 | 0.539 | | 4.0 | 2.4 | | 0.373 | 77.4 | 0.11 | 0.96 | 1.04 | 1.28 | 1.80 | 1.64 | 5.00 |
| | | | | | | | | | | | 3759 | 702 | 191 | 44 | 14 | 2 |

Table 7.8. Same as Table 7.7 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 | LFM | 19 | 0.569 | 1329 | 3.0 | 0.2 | 1333 | 0.394 | 81.4 | 0.14 | 1.06 | 0.77 | 0.72 | 0.70 | 0.50 | 1.00 |
| | NGM | 18 | 0.563 | | 3.7 | 2.0 | | 0.409 | 78.7 | 0.14 | 0.97 | 1.05 | 1.26 | 1.48 | 1.57 | 6.00 |
| | | | | | | | | | | | 3801 | 709 | 198 | 44 | 14 | 2 |
| 18 | LFM | 17 | 0.592 | 1069 | 3.2 | 0.1 | 1071 | 0.374 | 84.2 | 0.13 | 1.07 | 0.66 | 0.70 | 0.55 | 0.71 | 0.25 |
| | NGM | 16 | 0.621 | | 3.7 | 2.0 | | 0.402 | 81.0 | 0.17 | 0.96 | 1.09 | 1.44 | 1.73 | 2.57 | 1.50 |
| | | | | | | | | | | | 3993 | 637 | 138 | 33 | 7 | 4 |
| 24 | LFM | 19 | 0.589 | 1015 | 3.4 | 0.3 | 1016 | 0.337 | 84.1 | 0.00 | 1.07 | 0.64 | 0.68 | 0.76 | 0.00 | 0.50 |
| | NGM | 18 | 0.569 | | 4.0 | 2.2 | | 0.373 | 80.6 | 0.03 | 0.96 | 1.13 | 1.38 | 1.68 | 2.43 | 2.50 |
| | | | | | | | | | | | 4041 | 594 | 146 | 34 | 7 | 2 |

Table 7.9. Comparative verification of LFM and NGM MOS surface wind forecasts for 18 stations in the Western 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 | LFM | 27 | 0.399 | 377 | 4.0 | 1.8 | 382 | 0.375 | 90.5 | 0.00 | 1.00 | 1.04 | 0.85 | 0.67 | 0.00 | * |
| | NGM | 26 | 0.425 | | 3.7 | 2.0 | | 0.430 | 90.9 | 0.00 | 0.99 | 1.15 | 0.93 | 0.67 | 0.00 | * |
| | | | | | | | | | | | 2877 | 190 | 55 | 12 | 1 | 0 |
| 18 | LFM | 26 | 0.434 | 495 | 4.1 | 1.4 | 497 | 0.358 | 85.5 | 0.25 | 1.04 | 0.74 | 0.72 | 0.93 | 1.60 | 0.00 |
| | NGM | 26 | 0.447 | | 4.2 | 1.8 | | 0.376 | 85.0 | 0.27 | 1.02 | 0.87 | 0.91 | 1.10 | 0.80 | 1.50 |
| | | | | | | | | | | | 2682 | 306 | 99 | 30 | 5 | 2 |
| 24 | LFM | 31 | 0.352 | 656 | 3.8 | 1.4 | 661 | 0.351 | 83.3 | 0.00 | 1.02 | 0.86 | 1.08 | 0.47 | 2.00 | 0.00 |
| | NGM | 29 | 0.359 | | 4.1 | 1.9 | | 0.317 | 81.8 | 0.00 | 1.01 | 0.89 | 1.27 | 1.11 | 2.00 | 0.00 |
| | | | | | | | | | | | 2633 | 388 | 75 | 19 | 1 | 1 |

Table 7.10. Same as Table 7.9 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 | LFM | 27 | 0.375 | 715 | 3.6 | 1.3 | 717 | 0.350 | 83.3 | 0.00 | 1.02 | 0.87 | 1.03 | 0.84 | 2.00 | 0.00 |
| | NGM | 27 | 0.401 | | 3.9 | 1.7 | | 0.325 | 81.7 | 0.00 | 1.00 | 0.93 | 1.28 | 1.37 | 4.00 | 1.00 |
| | | | | | | | | | | | 2651 | 389 | 74 | 19 | 1 | 1 |
| 18 | LFM | 25 | 0.441 | 387 | 4.3 | 1.7 | 394 | 0.337 | 90.7 | * | 1.01 | 0.99 | 0.71 | 0.29 | * | * |
| | NGM | 23 | 0.493 | | 4.5 | 2.3 | | 0.328 | 89.4 | 0.00 | 0.99 | 1.18 | 1.05 | 0.79 | ** | * |
| | | | | | | | | | | | 2893 | 176 | 59 | 14 | 0 | 0 |
| 24 | LFM | 27 | 0.417 | 312 | 4.0 | 1.4 | 317 | 0.301 | 90.8 | 0.00 | 1.02 | 0.81 | 0.56 | 0.38 | 0.00 | * |
| | NGM | 26 | 0.458 | | 4.3 | 2.3 | | 0.349 | 90.2 | 0.00 | 1.00 | 1.02 | 1.04 | 0.46 | 2.00 | * |
| | | | | | | | | | | | 2898 | 186 | 54 | 13 | 1 | 0 |

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

Table 7.11 Verification of LFM MOS surface wind forecasts 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 | LFM | 26 | 0.493 | 321 | 4.6 | 2.5 | 329 | 0.441 | 81.5 | 0.00 | 0.97<br>859 | 1.12<br>110 | 1.18<br>56 | 1.18<br>17 | 1.33<br>3 | 0.00<br>1 |
| 18 | LFM | 25 | 0.487 | 323 | 5.0 | 2.5 | 328 | 0.359 | 78.5 | 0.00 | 0.97<br>848 | 1.26<br>102 | 0.84<br>68 | 1.33<br>15 | 1.75<br>4 | 1.00<br>1 |
| 24 | LFM | 33 | 0.460 | 361 | 5.3 | 3.2 | 369 | 0.319 | 75.7 | 0.14 | 0.97<br>825 | 1.18<br>107 | 0.90<br>71 | 1.75<br>16 | 3.33<br>3 | 0.00<br>3 |

Table 7.12. Same as Table 7.11 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 | LFM | 24 | 0.518 | 320 | 4.3 | 1.8 | 325 | 0.402 | 79.6 | 0.14 | 0.98<br>834 | 1.18<br>106 | 0.86<br>70 | 1.67<br>15 | 0.67<br>3 | 0.00<br>3 |
| 18 | LFM | 24 | 0.497 | 323 | 4.7 | 2.7 | 333 | 0.355 | 78.9 | 0.17 | 1.00<br>850 | 0.90<br>125 | 0.92<br>59 | 2.15<br>13 | 0.67<br>3 | **<br>0 |
| 24 | LFM | 29 | 0.422 | 328 | 5.2 | 2.8 | 337 | 0.348 | 78.7 | 0.00 | 0.96<br>872 | 1.32<br>105 | 0.96<br>56 | 1.00<br>17 | 1.67<br>3 | 1.00<br>1 |

** This category was forecast but was not observed.

Table 7.13. Verification of local surface wind forecasts for 93 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 | 22 | 0.545 | 5925 | 3.4 | 2.1 | 6020 | 0.434 | 87.1 | 0.03 | 0.97<br>14185 | 1.30<br>1423 | 0.88<br>358 | 0.91<br>57 | 0.75<br>16 | 0.33<br>3 |
| 9 | LOCAL | 30 | 0.417 | 9710 | 3.4 | 1.4 | 9786 | 0.377 | 74.6 | 0.17 | 0.99<br>11909 | 1.14<br>3039 | 0.75<br>871 | 0.44<br>167 | 0.48<br>33 | 0.20<br>5 |
| 15 | LOCAL | 35 | 0.366 | 8573 | 4.2 | 2.9 | 8750 | 0.310 | 78.4 | 0.11 | 0.92<br>13587 | 1.54<br>1872 | 1.16<br>450 | 0.64<br>88 | 0.38<br>26 | 0.25<br>4 |

Table 7.14. Same as Table 7.13 except 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 | 25 | 0.484 | 10221 | 3.1 | 1.4 | 10309 | 0.424 | 75.8 | 0.23 | 0.96<br>12077 | 1.23<br>3050 | 0.87<br>853 | 0.50<br>167 | 0.64<br>39 | 0.67<br>3 |
| 9 | LOCAL | 33 | 0.397 | 6593 | 4.1 | 2.6 | 6761 | 0.320 | 83.0 | 0.12 | 0.97<br>13972 | 1.30<br>1601 | 0.84<br>391 | 0.46<br>74 | 0.80<br>15 | **<br>0 |
| 15 | LOCAL | 35 | 0.376 | 5777 | 4.2 | 2.7 | 5935 | 0.316 | 84.9 | 0.00 | 0.98<br>14225 | 1.29<br>1407 | 0.79<br>350 | 0.49<br>61 | 0.47<br>17 | **<br>0 |

** This category was forecast but was not observed.

Table 7.15. Verification of local surface wind forecasts for 24 stations in the Eastern Region 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 | 0.502 | 1776 | 3.5 | 2.2 | 1802 | 0.398 | 84.9 | 0.00 | 0.98<br>3642 | 1.19<br>427 | 0.89<br>115 | 1.91<br>11 | 1.00<br>5 | **<br>0 |
| 9 | LOCAL | 30 | 0.392 | 2816 | 3.3 | 1.4 | 2830 | 0.340 | 72.3 | 0.14 | 0.99<br>3086 | 1.13<br>826 | 0.75<br>248 | 0.67<br>39 | 1.00<br>4 | *<br>0 |
| 15 | LOCAL | 35 | 0.331 | 2309 | 4.2 | 3.0 | 2354 | 0.320 | 78.7 | 0.00 | 0.92<br>3575 | 1.58<br>470 | 1.27<br>118 | 0.81<br>26 | 0.22<br>9 | 0.00<br>1 |

Table 7.16. Same as Table 7.15 except 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 | 25 | 0.460 | 2757 | 3.0 | 1.5 | 2776 | 0.400 | 75.8 | 0.33 | 0.95<br>3196 | 1.21<br>778 | 1.03<br>181 | 0.43<br>35 | 0.50<br>6 | 2.00<br>1 |
| 9 | LOCAL | 35 | 0.340 | 1887 | 4.0 | 2.5 | 1926 | 0.328 | 82.2 | 0.13 | 0.97<br>3626 | 1.30<br>444 | 0.80<br>118 | 0.71<br>17 | 2.50<br>2 | **<br>0 |
| 15 | LOCAL | 35 | 0.337 | 1701 | 4.2 | 2.9 | 1745 | 0.327 | 83.8 | 0.00 | 0.95<br>3725 | 1.50<br>365 | 0.91<br>99 | 0.56<br>18 | 1.67<br>3 | **<br>0 |

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

Table 7.17. Verification of local surface wind forecasts for 23 stations in the Southern Region 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 | 0.557 | 1175 | 3.6 | 2.6 | 1201 | 0.418 | 91.1 | 0.00 | 0.98<br>3537 | 1.46<br>227 | 0.58<br>38 | 0.60<br>5 | 0.33<br>3 | *<br>0 |
| 9 | LOCAL | 29 | 0.420 | 2248 | 3.2 | 1.6 | 2266 | 0.397 | 79.4 | 0.33 | 0.99<br>3020 | 1.15<br>645 | 0.50<br>129 | 0.15<br>13 | 0.50<br>2 | 0.00<br>1 |
| 15 | LOCAL | 33 | 0.375 | 1959 | 4.2 | 3.3 | 2001 | 0.273 | 83.0 | 0.50 | 0.93<br>3425 | 1.80<br>318 | 0.75<br>59 | 0.17<br>6 | 0.50<br>2 | *<br>0 |

Table 7.18. Same as Table 7.17 except 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 | 25 | 0.489 | 2577 | 3.1 | 1.8 | 2600 | 0.383 | 77.1 | 0.33 | 0.95<br>3109 | 1.32<br>676 | 0.67<br>139 | 0.29<br>17 | 0.60<br>5 | *<br>0 |
| 9 | LOCAL | 30 | 0.420 | 1416 | 4.2 | 3.1 | 1458 | 0.271 | 87.4 | * | 0.97<br>3478 | 1.52<br>246 | 0.56<br>55 | 0.40<br>5 | *<br>0 | *<br>0 |
| 15 | LOCAL | 34 | 0.390 | 1164 | 4.3 | 3.0 | 1204 | 0.248 | 88.7 | * | 0.99<br>3492 | 1.22<br>237 | 0.55<br>51 | 0.17<br>6 | *<br>0 | *<br>0 |

* This category was neither forecast nor observed.

Table 7.19. Verification of local surface wind forecasts for 28 stations in the Central Region 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 | 19 | 0.581 | 2246 | 3.1 | 1.8 | 2276 | 0.458 | 83.0 | 0.08 | 0.95<br>4062 | 1.37<br>600 | 0.99<br>152 | 0.70<br>33 | 1.00<br>6 | 0.00<br>2 |
| 9 | LOCAL | 27 | 0.446 | 3294 | 3.3 | 1.1 | 3312 | 0.374 | 68.1 | 0.14 | 0.97<br>3154 | 1.17<br>1218 | 0.88<br>363 | 0.41<br>81 | 0.32<br>22 | 0.50<br>2 |
| 15 | LOCAL | 32 | 0.392 | 2960 | 4.0 | 2.5 | 3013 | 0.304 | 71.5 | 0.11 | 0.89<br>3817 | 1.58<br>755 | 1.12<br>212 | 0.64<br>42 | 0.29<br>14 | 0.50<br>2 |

Table 7.20. Same as Table 7.19 except 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 | 22 | 0.518 | 3425 | 2.9 | 0.9 | 3441 | 0.443 | 71.0 | 0.21 | 0.94<br>3154 | 1.25<br>1190 | 0.85<br>395 | 0.53<br>90 | 0.60<br>20 | 0.00<br>2 |
| 9 | LOCAL | 31 | 0.430 | 2393 | 3.9 | 2.0 | 2437 | 0.329 | 77.6 | 0.14 | 0.97<br>3954 | 1.28<br>684 | 0.80<br>172 | 0.32<br>44 | 0.45<br>11 | *<br>0 |
| 15 | LOCAL | 32 | 0.397 | 2139 | 3.8 | 2.2 | 2185 | 0.337 | 80.5 | 0.00 | 0.98<br>4079 | 1.25<br>601 | 0.79<br>141 | 0.48<br>29 | 0.14<br>14 | *<br>0 |

* This category was neither forecast nor observed.

Table 7.21. Verification of local surface wind forecasts for 18 stations in the Western Region 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 | 26 | 0.449 | 728 | 3.9 | 2.2 | 741 | 0.388 | 91.4 | 0.00 | 1.00<br>2944 | 1.15<br>169 | 0.75<br>53 | 0.63<br>8 | 0.00<br>2 | 0.00<br>1 |
| 9 | LOCAL | 42 | 0.350 | 1352 | 4.2 | 1.9 | 1378 | 0.325 | 81.6 | 0.22 | 1.02<br>2649 | 1.04<br>350 | 0.63<br>131 | 0.38<br>34 | 0.80<br>5 | 0.00<br>2 |
| 15 | LOCAL | 42 | 0.306 | 1345 | 4.3 | 3.1 | 1382 | 0.296 | 82.8 | 0.25 | 0.98<br>2770 | 1.12<br>329 | 1.49<br>61 | 0.50<br>14 | 3.00<br>1 | 0.00<br>1 |

Table 7.22. Same as Table 7.21 except 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 | 35 | 0.415 | 1462 | 3.5 | 1.9 | 1492 | 0.406 | 81.7 | 0.15 | 1.00<br>2618 | 1.04<br>406 | 0.88<br>138 | 0.60<br>25 | 0.88<br>8 | *<br>0 |
| 9 | LOCAL | 41 | 0.326 | 897 | 4.8 | 3.5 | 940 | 0.271 | 87.0 | 0.00 | 0.98<br>2914 | 1.16<br>227 | 1.41<br>46 | 0.75<br>8 | 1.00<br>2 | *<br>0 |
| 15 | LOCAL | 46 | 0.295 | 773 | 5.0 | 3.4 | 801 | 0.266 | 88.3 | 0.00 | 1.00<br>2929 | 1.11<br>204 | 0.78<br>59 | 0.63<br>8 | **<br>0 | *<br>0 |

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

Table 7.23. Verification of local surface wind forecasts for 6 stations in the Alaska Region 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 | 19 | 0.624 | 400 | 3.6 | 1.7 | 410 | 0.545 | 84.7 | 0.00 | 0.97<br>862 | 1.17<br>112 | 1.32<br>57 | 0.76<br>17 | 0.33<br>3 | 0.50<br>2 |
| 9 | LOCAL | 30 | 0.481 | 405 | 4.9 | 2.9 | 424 | 0.375 | 78.6 | 0.00 | 0.96<br>858 | 1.29<br>105 | 1.09<br>68 | 1.07<br>15 | 0.25<br>4 | 1.00<br>1 |
| 15 | LOCAL | 40 | 0.353 | 455 | 5.0 | 2.8 | 471 | 0.269 | 73.1 | 0.00 | 0.96<br>843 | 1.37<br>111 | 0.97<br>78 | 0.89<br>18 | 1.00<br>3 | 0.50<br>2 |

Table 7.24. Same as Table 7.23 except 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 | 28 | 0.502 | 460 | 4.2 | 2.0 | 478 | 0.482 | 81.9 | 0.14 | 0.98<br>850 | 1.24<br>108 | 1.00<br>78 | 0.71<br>17 | 0.67<br>3 | 0.50<br>2 |
| 9 | LOCAL | 38 | 0.385 | 440 | 5.2 | 3.4 | 470 | 0.369 | 77.8 | 0.20 | 0.96<br>848 | 1.14<br>126 | 1.24<br>59 | 1.15<br>13 | 0.67<br>3 | **<br>0 |
| 15 | LOCAL | 41 | 0.334 | 442 | 5.7 | 3.9 | 476 | 0.318 | 76.6 | 0.00 | 0.94<br>871 | 1.32<br>107 | 1.28<br>58 | 1.12<br>17 | 0.67<br>3 | 0.50<br>2 |

** This category was forecast but was not observed.

Table 7.25. Comparative verification of local, LFM, and NGM MOS 42-h significant wind forecasts for 93 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 | LOCAL | 0.96 | 3.95 | 0.146 | 94.8 | 0.09 |
| | LFM MOS | 1.00 | 0.85 | 0.184 | 98.1 | 0.11 |
| | NGM MOS | 0.99 | 1.44 | 0.250 | 97.7 | 0.15 |
| | No. Obs. | 15803 | 201 | | | |
| ± 3-h Max | LOCAL | 0.99 | 1.32 | 0.259 | 93.8 | 0.17 |
| | LFM MOS | 1.03 | 0.29 | 0.205 | 96.2 | 0.12 |
| | NGM MOS | 1.02 | 0.48 | 0.289 | 96.1 | 0.18 |
| | No. Obs. | 15401 | 599 | | | |

Table 7.26. Same as Table 7.25 except for 92 stations for the 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 | LOCAL | 0.97 | 6.63 | 0.119 | 95.9 | 0.07 |
| | LFM MOS | 1.00 | 0.45 | 0.222 | 99.3 | 0.13 |
| | NGM MOS | 1.00 | 1.16 | 0.269 | 99.0 | 0.16 |
| | No. Obs. | 15873 | 98 | | | |
| ± 3-h Max | LOCAL | 0.98 | 1.96 | 0.227 | 95.4 | 0.14 |
| | LFM MOS | 1.02 | 0.13 | 0.161 | 98.0 | 0.09 |
| | NGM MOS | 1.01 | 0.34 | 0.229 | 97.9 | 0.13 |
| | No. Obs. | 15636 | 332 | | | |

Table 7.27. Comparative verification of local and LFM MOS 42-h significant wind forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

| Type of Verifying Observation | Type of Forecast | Bias by Category ≤ 22 kt | Bias by Category > 22 kt | Skill Score | Percent Forecast Correct | Threat Score 22 kt |
|---|---|---|---|---|---|---|
| 1-min Avg | LOCAL | 0.97 | 2.44 | 0.041 | 94.4 | 0.03 |
| | LFM MOS | 0.99 | 1.78 | 0.100 | 95.8 | 0.06 |
| | No. Obs. | 1020 | 18 | | | |
| ± 3-h Max | LOCAL | 1.01 | 0.79 | 0.139 | 92.0 | 0.10 |
| | LFM MOS | 1.02 | 0.57 | 0.219 | 93.6 | 0.14 |
| | No. Obs. | 970 | 56 | | | |

Table 7.28. Same as Table 7.27 except for the 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 | LOCAL | 0.97 | 3.29 | 0.217 | 95.6 | 0.13 |
| | LFM MOS | 0.98 | 2.57 | 0.266 | 96.5 | 0.16 |
| | No. Obs. | 1024 | 14 | | | |
| ± 3-h Max | LOCAL | 1.01 | 0.85 | 0.243 | 92.9 | 0.16 |
| | LFM MOS | 1.02 | 0.67 | 0.234 | 93.5 | 0.15 |
| | No. Obs. | 964 | 54 | | | |

Table 8.1. Comparative verification of LFM MOS and persistence ceiling height forecasts for 94 stations in the conterminous U.S., 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Log Score | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|---|
| 12 | MOS | 1.22 | 0.87 | 0.97 | 1.00 | 3.197 | 75.9 | 0.408 |
| | PERSISTENCE | 0.88 | 0.89 | 0.95 | 1.03 | 1.855 | 84.4 | 0.601 |
| | No. Obs. | 968 | 927 | 1949 | 11916 | | | |
| 18 | MOS | 1.30 | 0.79 | 1.11 | 0.98 | 2.584 | 76.6 | 0.406 |
| | PERSISTENCE | 1.65 | 0.96 | 0.81 | 1.01 | 2.966 | 75.5 | 0.357 |
| | No. Obs. | 513 | 852 | 2259 | 12033 | | | |
| 24 | MOS | 1.46 | 0.75 | 1.03 | 1.00 | 2.212 | 80.6 | 0.350 |
| | PERSISTENCE | 2.35 | 1.24 | 1.12 | 0.94 | 3.299 | 74.2 | 0.236 |
| | No. Obs. | 351 | 643 | 1570 | 12653 | | | |

Table 8.2. Same as Table 8.1 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 | 1.55 | 0.82 | 1.07 | 0.98 | 2.199 | 80.8 | 0.384 |
| | PERSISTENCE | 0.94 | 1.06 | 1.20 | 0.97 | 1.282 | 86.9 | 0.586 |
| | No. Obs. | 356 | 657 | 1596 | 12562 | | | |
| 18 | MOS | 1.56 | 0.68 | 0.98 | 0.99 | 3.047 | 77.6 | 0.366 |
| | PERSISTENCE | 0.50 | 0.97 | 1.14 | 1.01 | 2.424 | 79.0 | 0.385 |
| | No. Obs. | 685 | 741 | 1711 | 12369 | | | |
| 24 | MOS | 1.74 | 0.70 | 0.89 | 0.98 | 3.972 | 73.1 | 0.363 |
| | PERSISTENCE | 0.35 | 0.78 | 1.01 | 1.07 | 3.479 | 72.3 | 0.261 |
| | No. Obs. | 983 | 927 | 1957 | 11732 | | | |

Table 8.3. Comparative verification of LFM MOS and persistence ceiling height forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Log Score | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|---|
| 12 | MOS | 0.60 | 1.13 | 1.87 | 0.82 | 3.209 | 68.5 | 0.363 |
| | PERSISTENCE | 0.72 | 0.91 | 1.01 | 1.02 | 2.011 | 82.9 | 0.579 |
| | No. Obs. | 40 | 53 | 166 | 744 | | | |
| 18 | MOS | 0.48 | 0.98 | 1.71 | 0.84 | 3.284 | 65.5 | 0.291 |
| | PERSISTENCE | 0.96 | 0.92 | 0.86 | 1.04 | 2.890 | 72.4 | 0.322 |
| | No. Obs. | 27 | 49 | 183 | 710 | | | |
| 24 | MOS | 0.22 | 1.18 | 1.75 | 0.83 | 3.031 | 64.7 | 0.254 |
| | PERSISTENCE | 1.35 | 1.18 | 0.86 | 1.01 | 3.396 | 68.0 | 0.196 |
| | No. Obs. | 23 | 39 | 185 | 736 | | | |

Table 8.4. Same as Table 8.3 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 | 0.68 | 0.98 | 1.58 | 0.87 | 2.913 | 69.4 | 0.331 |
| | PERSISTENCE | 1.32 | 0.91 | 0.91 | 1.02 | 1.892 | 81.1 | 0.523 |
| | No. Obs. | 22 | 43 | 177 | 722 | | | |
| 18 | MOS | 0.48 | 1.26 | 1.89 | 0.79 | 3.186 | 65.8 | 0.292 |
| | PERSISTENCE | 1.12 | 1.17 | 0.90 | 1.01 | 2.811 | 73.6 | 0.323 |
| | No. Obs. | 25 | 35 | 177 | 733 | | | |
| 24 | MOS | 0.41 | 1.27 | 1.88 | 0.82 | 3.901 | 62.6 | 0.234 |
| | PERSISTENCE | 0.72 | 0.80 | 1.01 | 1.03 | 3.613 | 68.2 | 0.201 |
| | No. Obs. | 39 | 49 | 161 | 733 | | | |

Table 8.5. Comparative verification of local and persistence ceiling height forecasts for 92 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 | 0.88 | 0.89 | 1.05 | 1.01 | 2.120 | 82.4 | 0.561 |
| | PERSISTENCE | 0.90 | 0.91 | 0.94 | 1.03 | 1.874 | 84.4 | 0.606 |
| | No. Obs. | 1001 | 943 | 1996 | 12101 | | | |
| 6 | LOCAL | 0.58 | 0.69 | 1.12 | 1.04 | 2.522 | 78.4 | 0.455 |
| | PERSISTENCE | 1.02 | 0.80 | 0.89 | 1.04 | 2.708 | 78.1 | 0.453 |
| | No. Obs. | 883 | 1065 | 2103 | 11974 | | | |
| 9 | LOCAL | 0.38 | 0.61 | 0.96 | 1.06 | 2.064 | 79.5 | 0.418 |
| | PERSISTENCE | 1.92 | 0.94 | 0.79 | 1.01 | 3.006 | 75.1 | 0.352 |
| | No. Obs. | 471 | 906 | 2342 | 12295 | | | |
| 15 | LOCAL | 0.33 | 0.74 | 1.25 | 1.00 | 1.827 | 81.5 | 0.377 |
| | PERSISTENCE | 2.29 | 1.26 | 1.11 | 0.93 | 3.354 | 74.0 | 0.241 |
| | No. Obs. | 396 | 676 | 1679 | 13265 | | | |

Table 8.6. Same as Table 8.5 except for 93 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 | 0.74 | 0.92 | 1.13 | 0.99 | 1.392 | 84.8 | 0.545 |
| | PERSISTENCE | 1.45 | 1.25 | 1.15 | 0.95 | 1.451 | 84.9 | 0.580 |
| | No. Obs. | 332 | 731 | 2050 | 13066 | | | |
| 6 | LOCAL | 0.54 | 0.89 | 1.32 | 0.98 | 1.694 | 82.7 | 0.450 |
| | PERSISTENCE | 1.21 | 1.32 | 1.40 | 0.93 | 2.018 | 80.1 | 0.427 |
| | No. Obs. | 395 | 694 | 1684 | 13234 | | | |
| 9 | LOCAL | 0.57 | 0.94 | 1.34 | 0.98 | 2.055 | 80.7 | 0.420 |
| | PERSISTENCE | 0.89 | 1.23 | 1.41 | 0.94 | 2.438 | 77.5 | 0.369 |
| | No. Obs. | 540 | 741 | 1675 | 13060 | | | |
| 15 | LOCAL | 0.57 | 1.15 | 1.31 | 0.97 | 2.976 | 75.2 | 0.375 |
| | PERSISTENCE | 0.52 | 1.08 | 1.24 | 0.99 | 3.418 | 72.1 | 0.278 |
| | No. Obs. | 911 | 846 | 1895 | 12368 | | | |

Table 8.7. Comparative verification of local and persistence ceiling height forecasts for 6 stations in the Alaska Region for the FT issuance time of approximately 0900 UTC.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Log Score | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|---|
| 3 | LOCAL | 0.76 | 0.46 | 0.95 | 1.06 | 1.975 | 80.6 | 0.494 |
| | PERSISTENCE | 0.87 | 0.89 | 0.95 | 1.03 | 2.035 | 82.4 | 0.559 |
| | No. Obs. | 38 | 54 | 172 | 774 | | | |
| 6 | LOCAL | 0.71 | 0.41 | 0.95 | 1.06 | 2.342 | 77.2 | 0.405 |
| | PERSISTENCE | 0.94 | 0.96 | 0.89 | 1.03 | 2.672 | 75.4 | 0.385 |
| | No. Obs. | 35 | 49 | 184 | 772 | | | |
| 9 | LOCAL | 0.64 | 0.21 | 0.93 | 1.08 | 2.562 | 74.1 | 0.310 |
| | PERSISTENCE | 1.11 | 0.91 | 0.86 | 1.04 | 3.017 | 71.8 | 0.298 |
| | No. Obs. | 28 | 53 | 189 | 766 | | | |
| 15 | LOCAL | 0.23 | 0.15 | 0.92 | 1.09 | 2.379 | 74.2 | 0.255 |
| | PERSISTENCE | 1.50 | 1.15 | 0.86 | 1.01 | 3.364 | 68.1 | 0.180 |
| | No. Obs. | 22 | 41 | 189 | 787 | | | |

Table 8.8. Same as Table 8.7 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 | 0.63 | 0.48 | 0.81 | 1.08 | 1.903 | 79.3 | 0.405 |
| | PERSISTENCE | 1.42 | 0.91 | 0.90 | 1.02 | 1.761 | 81.6 | 0.518 |
| | No. Obs. | 19 | 44 | 187 | 787 | | | |
| 6 | LOCAL | 0.44 | 0.35 | 0.89 | 1.07 | 2.060 | 76.6 | 0.307 |
| | PERSISTENCE | 1.50 | 0.93 | 0.94 | 1.01 | 2.208 | 77.6 | 0.401 |
| | No. Obs. | 18 | 43 | 177 | 798 | | | |
| 9 | LOCAL | 0.17 | 0.29 | 0.97 | 1.07 | 2.381 | 74.5 | 0.272 |
| | PERSISTENCE | 1.08 | 1.08 | 0.91 | 1.02 | 2.738 | 73.8 | 0.312 |
| | No. Obs. | 24 | 38 | 183 | 783 | | | |
| 15 | LOCAL | 0.13 | 0.21 | 1.19 | 1.06 | 2.880 | 71.6 | 0.249 |
| | PERSISTENCE | 0.67 | 0.79 | 0.99 | 1.03 | 3.507 | 68.4 | 0.195 |
| | No. Obs. | 39 | 52 | 171 | 775 | | | |

Table 9.1. Comparative verification of LFM MOS and persistence visibility forecasts for 94 stations in the conterminous U.S., 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Log Score | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|---|
| 12 | MOS | 1.53 | 1.10 | 1.13 | 0.94 | 3.157 | 73.6 | 0.353 |
| | PERSISTENCE | 0.85 | 0.84 | 0.88 | 1.04 | 1.631 | 84.8 | 0.574 |
| | No. Obs. | 617 | 871 | 2095 | 12335 | | | |
| 18 | MOS | 1.13 | 1.06 | 1.26 | 0.96 | 2.343 | 78.4 | 0.337 |
| | PERSISTENCE | 1.57 | 0.85 | 1.18 | 0.97 | 2.614 | 77.7 | 0.299 |
| | No. Obs. | 332 | 852 | 1550 | 13096 | | | |
| 24 | MOS | 1.13 | 0.97 | 1.09 | 0.99 | 1.808 | 82.4 | 0.337 |
| | PERSISTENCE | 2.60 | 1.14 | 1.24 | 0.94 | 2.694 | 77.0 | 0.227 |
| | No. Obs. | 199 | 628 | 1454 | 13464 | | | |

Table 9.2. Same as Table 9.1 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 | 1.24 | 0.92 | 1.09 | 0.99 | 1.757 | 83.0 | 0.371 |
| | PERSISTENCE | 1.03 | 1.15 | 0.95 | 1.00 | 1.092 | 88.9 | 0.583 |
| | No. Obs. | 204 | 629 | 1477 | 13316 | | | |
| 18 | MOS | 1.56 | 0.90 | 1.04 | 0.98 | 2.445 | 79.5 | 0.340 |
| | PERSISTENCE | 0.57 | 1.17 | 0.84 | 1.03 | 2.046 | 81.7 | 0.355 |
| | No. Obs. | 382 | 632 | 1676 | 13034 | | | |
| 24 | MOS | 2.05 | 0.99 | 1.02 | 0.94 | 3.870 | 71.2 | 0.307 |
| | PERSISTENCE | 0.34 | 0.85 | 0.67 | 1.10 | 3.052 | 74.5 | 0.227 |
| | No. Obs. | 635 | 875 | 2109 | 12160 | | | |

Table 9.3. Comparative verification of LFM MOS and persistence visibility forecasts for 6 stations in the Alaska Region, 0000 UTC cycle.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Log Score | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|---|
| 12 | MOS | 0.58 | 1.01 | 0.87 | 1.04 | 3.085 | 72.1 | 0.227 |
| | PERSISTENCE | 0.85 | 0.96 | 0.88 | 1.03 | 2.231 | 79.2 | 0.428 |
| | No. Obs. | 26 | 70 | 135 | 788 | | | |
| 18 | MOS | 0.34 | 0.71 | 1.43 | 1.01 | 3.365 | 72.5 | 0.218 |
| | PERSISTENCE | 0.66 | 0.80 | 1.26 | 1.00 | 3.590 | 71.5 | 0.195 |
| | No. Obs. | 32 | 86 | 94 | 802 | | | |
| 24 | MOS | 0.64 | 0.81 | 1.31 | 1.00 | 3.322 | 73.1 | 0.190 |
| | PERSISTENCE | 0.79 | 0.90 | 1.36 | 0.98 | 3.625 | 71.2 | 0.161 |
| | No. Obs. | 28 | 77 | 86 | 808 | | | |

Table 9.4. Same as Table 9.3 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 | 0.72 | 0.65 | 1.18 | 1.02 | 3.056 | 75.8 | 0.252 |
| | PERSISTENCE | 1.10 | 1.15 | 1.00 | 0.98 | 2.276 | 81.8 | 0.477 |
| | No. Obs. | 29 | 75 | 88 | 790 | | | |
| 18 | MOS | 0.36 | 0.83 | 0.84 | 1.06 | 2.553 | 74.7 | 0.210 |
| | PERSISTENCE | 1.45 | 1.91 | 0.64 | 1.00 | 3.127 | 73.7 | 0.265 |
| | No. Obs. | 22 | 46 | 140 | 787 | | | |
| 24 | MOS | 0.81 | 0.57 | 1.35 | 0.98 | 3.497 | 69.3 | 0.197 |
| | PERSISTENCE | 1.22 | 1.32 | 0.67 | 1.02 | 3.783 | 69.7 | 0.177 |
| | No. Obs. | 27 | 65 | 132 | 773 | | | |

Table 9.5. Comparative verification of local and persistence visibility forecasts for 92 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 | 0.87 | 0.76 | 1.18 | 0.99 | 1.930 | 81.1 | 0.507 |
| | PERSISTENCE | 0.85 | 0.86 | 0.88 | 1.04 | 1.649 | 84.8 | 0.578 |
| | No. Obs. | 647 | 865 | 2129 | 12401 | | | |
| 6 | LOCAL | 0.47 | 0.47 | 1.00 | 1.08 | 2.419 | 77.5 | 0.375 |
| | PERSISTENCE | 0.88 | 0.63 | 0.91 | 1.06 | 2.607 | 77.0 | 0.381 |
| | No. Obs. | 632 | 1177 | 2063 | 12154 | | | |
| 9 | LOCAL | 0.31 | 0.44 | 1.01 | 1.05 | 1.716 | 83.0 | 0.359 |
| | PERSISTENCE | 2.06 | 0.86 | 1.18 | 0.97 | 2.581 | 77.6 | 0.299 |
| | No. Obs. | 268 | 868 | 1589 | 13290 | | | |
| 15 | LOCAL | 0.27 | 0.51 | 1.01 | 1.03 | 1.485 | 84.7 | 0.347 |
| | PERSISTENCE | 2.44 | 1.15 | 1.29 | 0.94 | 2.742 | 76.8 | 0.231 |
| | No. Obs. | 227 | 646 | 1446 | 13697 | | | |

Table 9.6. Same as Table 9.5 except for 93 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 | 0.65 | 0.62 | 1.27 | 1.00 | 1.240 | 86.9 | 0.499 |
| | PERSISTENCE | 1.30 | 1.20 | 1.12 | 0.97 | 1.275 | 87.4 | 0.549 |
| | No. Obs. | 206 | 728 | 1430 | 13812 | | | |
| 6 | LOCAL | 0.58 | 0.63 | 1.19 | 1.00 | 1.385 | 85.6 | 0.434 |
| | PERSISTENCE | 1.20 | 1.34 | 1.11 | 0.97 | 1.672 | 83.9 | 0.426 |
| | No. Obs. | 222 | 652 | 1448 | 13684 | | | |
| 9 | LOCAL | 0.62 | 0.86 | 1.16 | 1.00 | 1.592 | 83.9 | 0.406 |
| | PERSISTENCE | 1.02 | 1.43 | 1.03 | 0.98 | 1.953 | 81.9 | 0.364 |
| | No. Obs. | 262 | 610 | 1559 | 13585 | | | |
| 15 | LOCAL | 0.56 | 1.07 | 1.21 | 0.98 | 2.523 | 77.0 | 0.339 |
| | PERSISTENCE | 0.47 | 1.18 | 0.85 | 1.03 | 2.794 | 76.3 | 0.261 |
| | No. Obs. | 563 | 739 | 1876 | 12842 | | | |

Table 9.7. Comparative verification of local and persistence visibility forecasts for 6 stations in the Alaska Region for the FT issuance time of approximately 0900 UTC.

| Projection (h) | Type of Forecast | Bias by Category 1 | 2 | 3 | 4 | Log Score | Percent Correct | Skill Score |
|---|---|---|---|---|---|---|---|---|
| 3 | LOCAL | 1.08 | 0.42 | 1.12 | 1.03 | 2.181 | 79.3 | 0.417 |
| | PERSISTENCE | 0.85 | 0.95 | 0.97 | 1.01 | 2.214 | 79.2 | 0.429 |
| | No. Obs. | 26 | 73 | 130 | 807 | | | |
| 6 | LOCAL | 0.88 | 0.37 | 1.24 | 1.02 | 2.592 | 75.4 | 0.308 |
| | PERSISTENCE | 0.88 | 0.89 | 1.00 | 1.01 | 2.702 | 75.9 | 0.336 |
| | No. Obs. | 25 | 76 | 127 | 810 | | | |
| 9 | LOCAL | 0.55 | 0.19 | 1.53 | 1.05 | 2.944 | 75.0 | 0.207 |
| | PERSISTENCE | 0.67 | 0.77 | 1.47 | 0.99 | 3.523 | 72.0 | 0.198 |
| | No. Obs. | 33 | 88 | 85 | 828 | | | |
| 15 | LOCAL | 0.15 | 0.15 | 1.19 | 1.09 | 2.628 | 77.2 | 0.171 |
| | PERSISTENCE | 0.81 | 0.88 | 1.41 | 0.97 | 3.497 | 71.5 | 0.167 |
| | No. Obs. | 27 | 78 | 90 | 842 | | | |

Table 9.8. Same as Table 9.7 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 | 0.63 | 0.45 | 1.08 | 1.05 | 2.275 | 80.8 | 0.340 |
| | PERSISTENCE | 1.22 | 1.08 | 0.99 | 0.99 | 2.145 | 82.7 | 0.478 |
| | No. Obs. | 27 | 78 | 87 | 841 | | | |
| 6 | LOCAL | 0.56 | 0.31 | 0.99 | 1.07 | 2.343 | 77.9 | 0.217 |
| | PERSISTENCE | 1.83 | 1.08 | 0.88 | 0.99 | 2.752 | 77.2 | 0.316 |
| | No. Obs. | 18 | 77 | 100 | 838 | | | |
| 9 | LOCAL | 0.19 | 0.39 | 0.82 | 1.08 | 2.256 | 77.3 | 0.198 |
| | PERSISTENCE | 1.52 | 1.83 | 0.66 | 1.00 | 2.941 | 75.3 | 0.274 |
| | No. Obs. | 21 | 46 | 133 | 825 | | | |
| 15 | LOCAL | 0.18 | 0.26 | 0.96 | 1.10 | 2.738 | 74.4 | 0.177 |
| | PERSISTENCE | 1.18 | 1.20 | 0.70 | 1.02 | 3.670 | 71.0 | 0.183 |
| | No. Obs. | 28 | 70 | 126 | 809 | | | |