MRF-Based MOS Temperature/Dewpoint Forecasts

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Predictand Definitions

Daytime Max – 7 AM to 7 PM Local Standard Time.

Nighttime Min – 7 PM to 8 AM Local Standard Time.

Calculated from METAR Observations

Temperature – 2 meter shelter; every 6 hours.

Dewpoint – 2 meter shelter; every 6 hours.

Forecast Projections – 18 to 192 hours.

Predictors Offered

Model Predictors

- Temperatures
- Dewpoints
- Thicknesses
- U-V Winds/Wind Speed
- Vertical Velocities
- Mean RH
- Model Precipitation
- Lapse Rates

Geoclimatic Predictors

- Sin/Cos (DOY)
- Sin/Cos (2*DOY)

Observed Predictors

- 06 UTC Temperature
- 06 UTC Dewpoint

Key Predictors

- 2-meter (max) or 1000 mb (min) Temperature
- Low Level Thicknesses (1000-850mb, 1000-700mb)
- 1000 mb Dewpoint (min)
- 1000-500mb Mean Relative Humidity
- Geoclimatic Predictors

Developmental Sample

Dependent Sample:

- Cool Season (October - March):
  - 1992-97 MRF Reanalysis Forecast Data
  - 1997-98 and 1998-99 MRF Data
- Warm Season (April - September):
  - 1992-96 MRF Reanalysis Forecast Data
  - 1997, 1998 (except 6/16-7/21) and 1999 MRF Data

Independent Sample:

- April through July of 1999 warm season
- Last 15 days of each month in 98/99 cool season

Verification

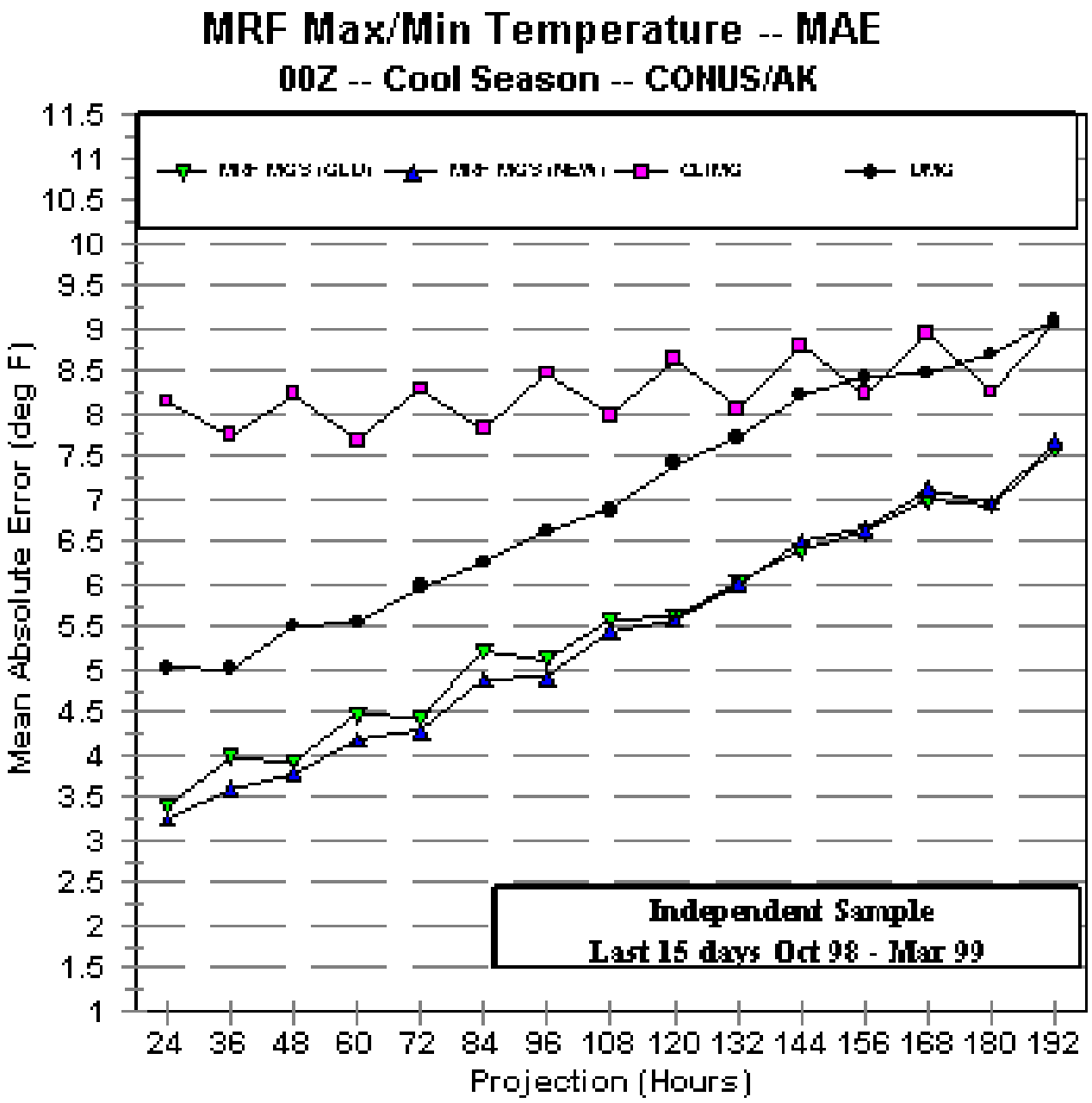
- Mean Absolute Error
- Mean Algebraic Error (Bias)

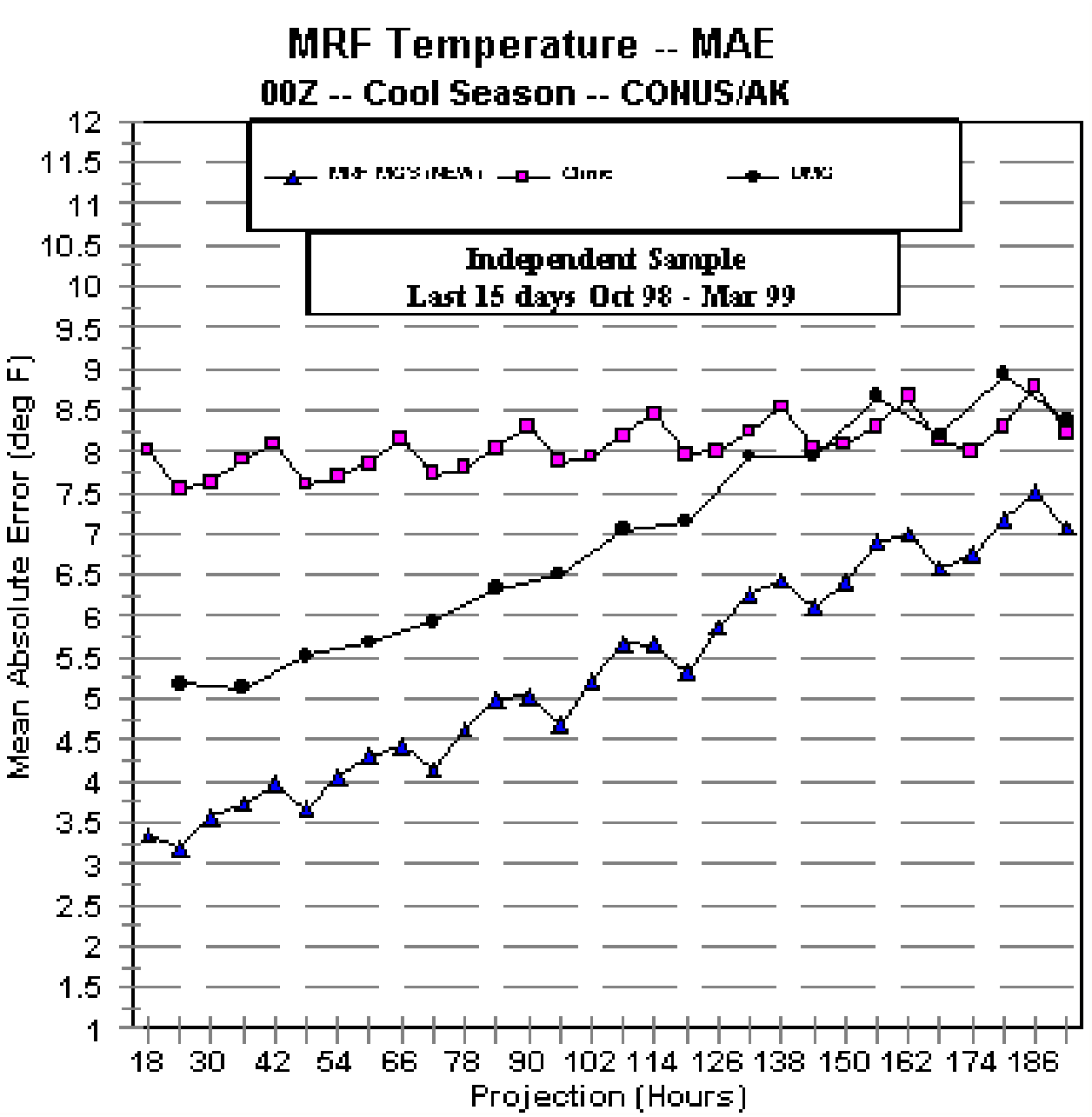
Daytime Max/Nighttime Min

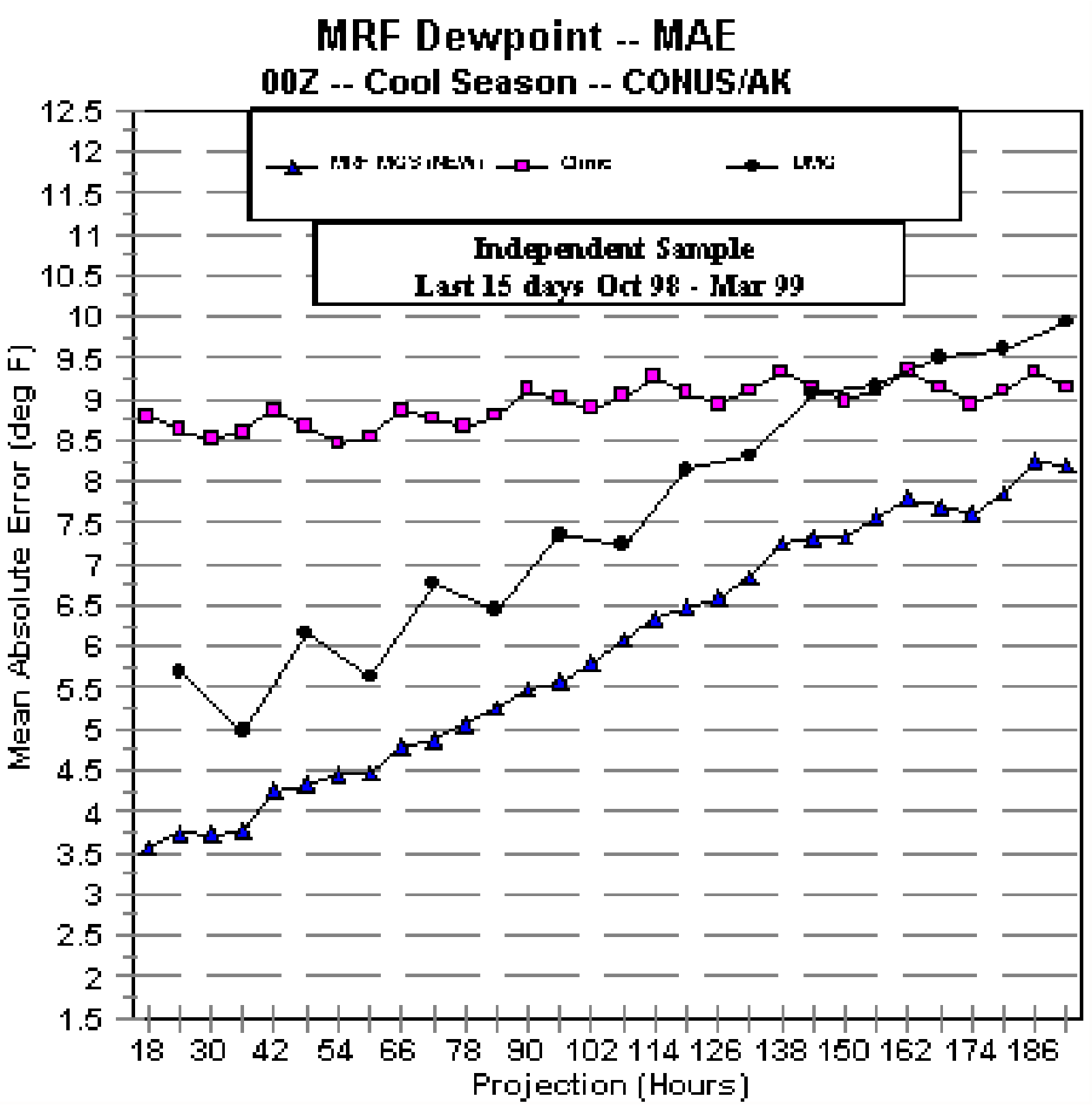
- Verified versus MRF MOS (OLD), DMO and Climo

Temperature/Dewpoint

- New Elements
- Verified versus DMO and Climo


MRF Max/Min Temperature -- MAE
00Z -- Cool Season -- CONUS/AK
Mean Absolute Error (deg F)
Projection (Hours)
11.5
11
10.5
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
24 36 48 60 72 84 96 108 120 132 144 156 168 180 192
CLIMO
Independent Sample
Last 15 days Oct 98 - Mar 99


MRF Temperature -- MAE
00Z -- Cool Season -- CONUS/AK
Independent Sample
Last 15 days Oct 98 - Mar 99
Clim
Mean Absolute Error (deg F)
12
11.5
11
10.5
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
18 30 42 54 66 78 90 102 114 126 138 150 162 174 186
Projection (Hours)


MRF Dewpoint -- MAE
00Z -- Cool Season -- CONUS/AK
Independent Sample
Last 15 days Oct 98 - Mar 99
Mean Absolute Error (deg F)
12.5
12
11.5
11
10.5
10
9.5
9
8.5
8
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6.5
6
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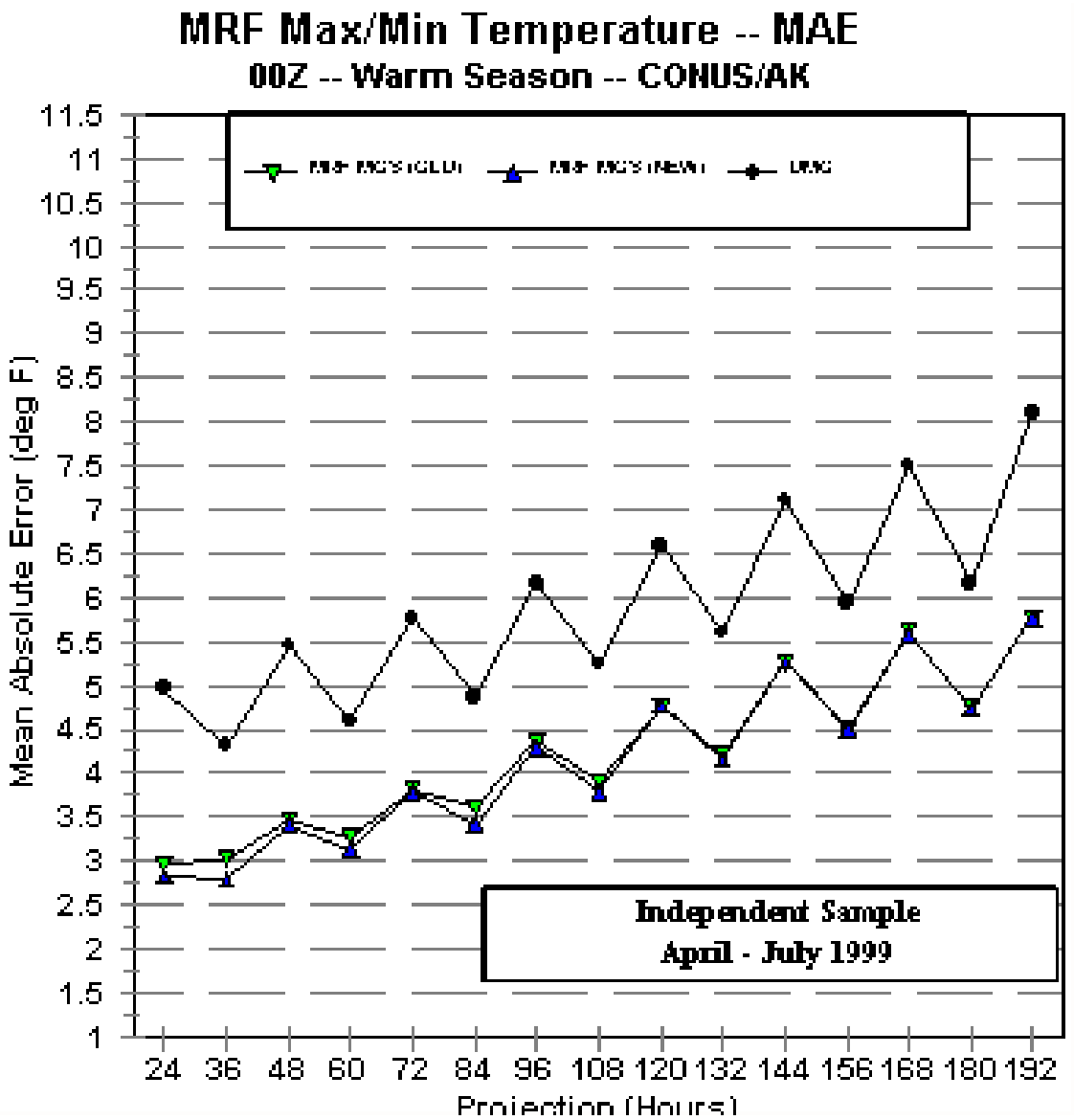
18 30 42 54 66 78 90 102 114 126 138 150 162 174 186
Projection (Hours)


MRF Max/Min Temperature -- MAE
00Z -- Warm Season -- CONUS/AK
Mean Absolute Error (deg F)
11.5
11
10.5
10
9.5
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8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
24 36 48 60 72 84 96 108 120 132 144 156 168 180 192
Projection (Hours)
Independent Sample
April - July 1999

Conclusions

Daytime Max and Nighttime Min

- More accurate the old MRF MOS out to 108 hours
- Comparable in skill out to 192 hours

Temperature and Dewpoint

- Improved significantly over DMO and CLIMO

Additional Results

- http://www.nws.noaa.gov/tdl/synop