NEW AVN MOS GUIDANCE

J. Paul Dallavalle

CAFTI - FEBRUARY 3, 2000

http://www.nws.noaa.gov/tdl/synop/results.htm
http://www.nws.noaa.gov/tdl/synop/cafti.htm

AVN MOS GUIDANCE

A NEW LOOK

- Available for 1000+ Sites in CONUS, AK, HI, PR
- Predictands from Current Observing System
- Predictands to 72 h
- Model Predictors from 95.25 km Grid
- Model Predictors valid every 3 h to 72 h
- 0600 / 1800 UTC AVN MOS Packages

AVN MOS SEASONS

- **WARM SEASON (APR. - SEPT.)**
  - **FINAL EQNS.:**
    - APR.1, 1997 - OCT. 15, 1997
    - MAR. 16, 1998 - OCT. 15, 1998
    - MAR. 16, 1999 - OCT. 15, 1999
- **COOL SEASON (OCT. - MAR.)**
  - **FINAL EQNS.:**
    - SEPT. 16, 1997 - APR. 15, 1998
    - SEPT. 16, 1998 - APR. 15, 1999

AVN MOS SEASONS-TESTING

- **WARM SEASON INDEPENDENT DATA**
  - LAST 15 DAYS OF APR., MAY, JUNE, JULY, AUG., SEPT. 1998 (WINDS)
  - APR. 1999 - SEPT. 1999 (TEMP. / DEW PT.)
- **COOL SEASON INDEPENDENT DATA**
  - LAST 15 DAYS OF OCT., NOV., DEC. 1998; AND JAN., FEB., MARCH 1999

AVN-BASED MOS GUIDANCE

- WIND SPEED/DIRECTION
- MAX/MIN TEMPERATURE
- 2-M TEMPERATURE/DEW POINT

AVN MOS TEMP/WIND PREDICTANDS

- u- and v-wind components, wind speed, 2-m temperature, 2-m dew point - valid every 3h from 6 to 72 h after 00 or 12 Z
- Daytime max (0700-1900 LST): ~ 24,48,72h after 00 Z; ~ 36 and 60h after 12 Z
- Nighttime min (1900-0800 LST): ~ 36,60h after 00 Z; 24,48,72 h after 12 Z

AVN MOS TEMP/WIND PREDICTORS

- **MODEL VARIABLES**
- **OBSERVATIONS AT 03 UTC OR 15 UTC**
  - FOR WIND, TO 15H PROJECTION
  - FOR TEMP/DP, TO 39H PROJECTION
- **GEOCLIMATIC VARIABLES**
  - SINE/COSINE DAY OF YEAR & TWICE DAY OF YEAR

MOS TESTING STRATEGY

- **DEVELOP TEST EQUATIONS**
- **MAKE FORECASTS ON INDEPENDENT DATA**
- **VERIFY ~335 STATIONS CLUSTERED BY REGIONS**
  - CONUS/ALASKA, NE US, NC US, NW US, SE US, SC US, SW US, ALASKA, HI/PR

VERIFICATION MEASURES

- **WIND SPEED**
  - MEAN ABSOLUTE ERROR, HEIDKE SKILL SCORE, PROBABILITY OF DETECTION
- **WIND DIRECTION**
  - MEAN ABSOLUTE ERROR, CUM. REL. FREQ. OF WIND DIR. ERRORS OF 30° OR LESS
- **TEMPERATURE/DEW POINT**
  - MEAN ABSOLUTE ERROR

CONCLUSIONS

- AVN MOS WIND GUIDANCE IS SUPERIOR TO NGM MOS
- AVN MOS TEMPERATURE GUIDANCE TENDS TO BE MORE ACCURATE AT ≥ 36H PROJ. IN COOL SEASON; NGM MOS TENDS TO BE MORE ACCURATE IN WARM SEASON AT ≤ 48H PROJECTION
- AVN MOS DEW PT GUIDANCE TENDS TO BE MORE ACCURATE THAN NGM MOS
- REGIONAL VARIATIONS EXIST

MOS GUIDANCE

Implementation Plans

- Apr. 2000 - AVN MOS Message (00Z / 12Z)
- Apr. 2000 - New MRF MOS Message
- Oct. 2000 - Complete AVN MOS (No Snow)
- Oct. 2000 - Complete MRF MOS (No Snow)
- Oct. 2000 - Partial AVN MOS (06 / 18Z)
- Oct. 2000 - Eta MOS Thunderstorm Guidance
- Apr. 2001 - NGM MOS Removed

NEW AVN MOS GUIDANCE

```
KALB    AVN MOS GUIDANCE    10/24/1999  0000 UTC
DT /OCT 24                  /OCT 25                 /OCT 26                 /
HR   06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 18 00
X/N                 49                  30                  61          43    61
TMP  32 30 30 41 47 47 38 34 32 32 34 47 58 60 54 50 48 47 49 57 53
DPT  25 23 23 24 23 23 24 26 28 28 30 32 34 37 39 41 43 43 45 45 44
CLD  CL CL CL CL CL CL CL CL BC BC CL CL CL CL CL CL CL BC BC BC BC
WDR  32 32 32 31 31 32 32 00 00 00 36 15 16 15 16 16 16 16 18 18 19
WSP  08 08 08 11 12 09 02 00 00 00 01 04 10 08 04 06 08 06 11 12 08
P06        0      0      0      3      5      0      0      9    14 15 20
P12                   0                  6                  0    17    25
Q06        0      0      0      0      0      0      0      0     0  0  0
Q12                   0                  0                  0     0     1
T06     0/ 7   0/ 1   0/ 2   0/ 4   2/ 1   1/ 1   2/ 1  18/ 3   4/ 2 22/ 3
T12            0/ 7          0/ 3          4/ 2         14/ 4    10/ 3
TYP   S  S  S  S  S  S  S  R  R  R  R  R  R  R  R  R  R  R  R  R  R
POZ   0  0  5  9 11  9 15 13  7 10  5  0  0  0  0  1  0  1  0  0  0
POS  84  0 95 90 75 47 35 16 20  5  6  0  0  0  0  1  1  1  0  0  0
SNW                 0                  0                  0           0
CIG   7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7  7
VIS   7  7  7  7  7  7  7  7  7  7  5  7  7  7  7  5  5  1  5  6  7
OBV   N  N  N  N  N  N  N  N  N  N HZ  N  N  N  N HZ HZ FG HZ HZ  N
```

FUTURE MOS EFFORTS

- **Binary Forecast Products (BUFR)**
- **New Forecast Sites**
- **Additional Forecast Elements (new weather element definitions, 6/18Z cycles, Eta model)**
- **Increased Temporal Resolution in Forecasts**
- **Periodic Update of Forecast Equations**
  - After initial implementation, equations will be updated seasonally
  - Seasonal update will be done if archived data indicate a need for the update