New Warm Season AVN-based MOS PoP Forecasts

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The New AVN-Based MOS PoP System

What’s new?

- **MORE STATIONS:**
  - 1060 Forecast Sites
  - Add HI, PR

- **MORE FORECASTS, CONSISTENTLY(!):**
  - Available at projections of 12-72 hours
  - Consistency enforced between 6- and 12-h PoP

- **BETTER RESOLUTION:**
  - Predictor fields on 95.25 km grid
  - Predictor fields available at 3-h timesteps
  - Predictor fields available beyond 48-h projection

* No extrapolative forecasts, as with NGM MOS!*
CHALLENGE TO NEW MOS DEVELOPMENT:

RAPIDLY EVOLVING NWP MODELS AND OBSERVATION PLATFORMS

Make for:

1. SHORT, UNREPRESENTATIVE DATA SAMPLES
2. DIFFICULT COLLECTION OF APPROPRIATE PREDICTAND DATA

New observing systems: (ASOS, WSR-88D)
(co-Op, Mesonets)

But “old” predictands
The New AVN MOS PoP System

To ensure that model changes and small sample size had minimal impact on PoP performance, we relied upon...

1. Improved AVN model realism
   better model = better statistical system

2. Consistent archive grid used throughout
   smoothing of fine-scale detail
   constant grid length for grid-sensitive calculations

3. Enlarged geographic regions
   larger data pools help to stabilize equations

4. Use of “robust” predictor variables
   no boundary layer variables
   variables presumed immune to known model changes
# The New AVN-Based MOS PoP System

## System Development: AVN vs. NGM

<table>
<thead>
<tr>
<th></th>
<th>NGM</th>
<th>AVN</th>
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<tbody>
<tr>
<td><strong>Predicrand</strong></td>
<td>SAO; 399 Sites CONUS</td>
<td>ASOS; 540 Sites CONUS, HI, PR</td>
</tr>
<tr>
<td><strong>Data:</strong></td>
<td>27 Sites AK</td>
<td>27 Sites AK</td>
</tr>
<tr>
<td><strong>Sample:</strong></td>
<td>5yr CONUS 8yr AK</td>
<td>3yr CONUS 3yr AK</td>
</tr>
<tr>
<td><strong>Regions:</strong></td>
<td>25 CONUS; 8 AK</td>
<td>11 CONUS; 4 AK</td>
</tr>
<tr>
<td><strong>Predictors:</strong></td>
<td>NGM Basic Fields, NGM Derived Fields, NGM Grid Binaries, Geoclimatic Variables</td>
<td>AVN Basic Fields, AVN Derived Fields, AVN Grid Binaries, Geoclimatic Variables</td>
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</table>
Warm Season PoP (CONUS)

Apr-July, 2000  0000 UTC Cycle

300 Sites

P-Score

Projection (Hours)

6H AVN MOS
6H NGM MOS
12H AVN MOS
12H NGM MOS
Warm Season PoP (CONUS)

% Improvement over NGM MOS; Apr-July, 2000

300 Sites

P-score % Improvement

Projection (Hours)

N.A.

6H AVN MOS
12H AVN MOS

12 18 24 30 36 42 48 54 60 66 72
Warm-Season AVN MOS PoP Performance
A Summary

- AVN MOS PoP outperforms NGM MOS in all regions at most every projection.

  Overall 2-5% Improvement in P-score, Apr- July, 2000

- Regional variations exist.

  Diurnal variations in dry regions: SW, SE

  AVN Improvements greatest in NW; Smallest in NE, Alaska (Summer 2000?) (Data?)