I. INTRODUCTION

Donald L. Best, Major, USAF
Twenty test sites were selected for the independent verification.

10. For wind speed and direction, especially, these times are 1, 3, and #model The small change of MOS equations. These times are 1, and
errors are no worse than one reportable value from forecasts made by the con-
sequence, especially, in terms of
and sufficiently accurate forecasts. Such tests can be in the eye of the beh-
fore the operational acceptance of a 0.0 MOS equation set for surface wind.

3. EXPERIMENTAL DESIGN

Even the local bias is &= 5 8, then the B's S. model makes a forecast.
and almost by subtraction. For example, if the 0.0 model makes a forecast
S, and V, then the correction is then made to adjust the 0.0 model. The
so that the G.0 at each location over the different sample on the
corrected model is the original model with the E.G.S model's bias subtracted from it
(c.f. the table). The corrections need the B's S. model are determined by
a local adjustment. This adjustment is then made at each location. The
forecasts by comparing the local forecast and local observed means for
the local adjustment. The model is applied to all locations without consideration of local
model's and local unbalance. The unbalanced version exactly to the 0.0 model
Therefore, the 0.0 model in this experiment will have two corrections:
of all (1963, 1969) found that the preferred choices of the
these two corrections could improve local verifications.

Regressions, this experimental focus is on the ability of only two predictors
system does not have the preferred choices of the
being picked up. Standardized predictors were selected, since the TLS MOS
these predictors with a few predictors were
hence beyond the basic common ones such as the 850 mb and boundary layer wind.
selected predictors that may be important to only a few sections of
building on the G.0 model. At least the G.0 model has an advantage over the
at about 10 to 12 predictors, this 0 predictors limitation is not considered too
here is the number of sections which favored the S. model by 10° or more.

Pfes. 3 and 4 provide specific comparisons between the S. 6. 9. 10. 11. 12. and 13.5.

Figure 2 is similar to Fig. 1, but compares the 6. 9. 12. 15. and 18. 20.

1. "Calla"

each section had a difference exceeding the 1.0° at the mean

definition.

2. It appears that the S. model is superior above the altitude

throughout all coastal states, but there is no strict guarantee of this--just a

In other words, if the models are not completely identical, then such easily identified areas of divergence

not be completely puzzling to reflect such easily identified areas of divergence. The model

advantages is calculated for each case of subjective interpretation. The higher the

models, the greater the difference in any case was the difference between the two models

and G.0. models for wind and speed vectors. Notice that in no case was the difference

parameterization for which the 0. model may not be accounted.

across the country. This suggests that some variations are due to location.

4. These figures illustrate how the S. model and its wind and speed vectors performed at each site.

Vertically for each station is displayed on a series of figures (1 through

4. EXPERIMENTAL RESULTS

on the independent verification sample of data and location data shown above.

wind speeds were used before verification. All conclusions were based

speed and wind direction--the u and v components were not verified explicitly.

statistics and the percent improvement. The few differences were in the differences in

in 20 cases, but since this was less than 2%, comparisons were made on each of the

verification statistics for which speed and wind were verified for all nomograms verifying

Vertically, the S. model was used at 12 other stations over the dependent

sites. The 0. model was used at 12 other stations excluding the 20 cases

Large sample of available CONUS surface pressure stations were selected from a

dependent sample for each of the 20 test sites. These equations were verified over the

Single section NOE equations validated at 12 hours were developed from a

(2) Independent sample: April-September seasons for 1976-77 (2 years).

(1) Dependent sample: April-September seasons for 1973-75 (3 years).

observation sites, and selected location specific constraints.
those locations that have no history upon which to base a climatological

or to be applied to locations not originally in the development sample for the 0.0.s model. If the

areas of the country. This is an important feature for the E.S.S. model. Examination suggests that such a bias

and the local observed mean wind speed. Examination suggests that such a bias

Figure 3 shows the econetic values between the E.S.S., equation for wind speed.

values of 2 and 4 are the corrected values to use.

result of these accept measures to find the 6.0.s models and the attenuation.

As a special set of variables on the theme, I tried to improve the E.S.S.

B. Special Notes

Table 4 gives the 0.0. equation. Notice that 75% of the 20 predictors are

column constant. The predictors to use are

A. Generalized Operator Equation

Remarks and Conclusions

Table 3 compares the three MOS models for wind direction. Note that the

56% (0.18/0.32) of the potential improvement in percent correct and the

one of these between the E.S.S., and the 0.0. model. The E.S.S. performs for

score. Given that the possible range of improvement is defined by the differ-

scores. As depicted in Table 2, the D.S.S. model is a noticeable advantage.

and at least two of a location constant (station long-

Table 2 gives the 0.0. equation. Notice that 75% of the 20 predictors are

Table 1 compares the three MOS models for wind direction. Note that the

scores over the 0.0. model. The E.S.S. model does not

75% (0.18/0.32) of the potential improvement in correct and 85%
so much the better.

have some operational utility. If it turned out to be superior

table goodness that would make a simple 6.0. or R.S. model, one to attain an accc-

with your. one not to be the S.M. model, but to elieve in accc-

of the C.G. model, or shorter. The objective of the expansion.

the S.M. model, it is again encountering the lack of certain

large has more apparent success than this experiment in "parting"

the better results of the current single station models. Since

forecasts in both wind direction and speed and complete

his regional equations were better than coastal single station

from found that stable, unaltered control processes produced forecasts from

important. However, dynamic predictions become

predicts as it should. However, dynamic predictions become

appear effects in the wind forecast models and found the short-

with the wind model in the wind predictions. We also need to

large (T.]77) did some particular interpretative work in the forecast-

(3)

deciduous model, of which some were selected as predictions

of the wind forecast model. Local area, in general, and coastal effects become

brought and afterthought (196]) in forecasting local wind climate

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REFERENCES

Brom of the Systems Development Office who typed this paper.

6. ACKNOWLEDGMENTS

In a real case, mobile environment where reliance on conventional production support can be particularly appealing to military applications in making point forecasts. This is where the forecast correlation between the model and the actual target tends to the 20 best scores, and forecasting the control sample for the same test scores can be expected of models. Typical ensemble models could be trained over S.S. 6.

I want to express my deepest gratitude to Captain Charles French for bearing

port can often be interpreted.
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S.S. G.O. E.S.S. E.S. E.S.

R.M.S.E.

M.A.E.

Generalized operator (G.O.), and equivalent simple station for the three sets of forecasts: simple station (S.S.),
<table>
<thead>
<tr>
<th>Percent Corr.</th>
<th>S.S.</th>
<th>G.O.</th>
<th>E.S.S.</th>
<th>Heike Skill</th>
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|          | DTH | BAL | FAT | PDX | CEC | IND | SAN | BLX | LNY | CLO | ADG | 230 | RY | BLT | REX | STL | ATL | SAT | NYX | TPA |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|          |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

Note: The table contains various entries that do not seem to follow a clear pattern or context. The table might be part of a report or study, possibly related to meteorology or climate data, given the names of stations and the format of the table.
<table>
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<th>E.S.</th>
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<th>G.0.</th>
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**ME**

**Overall**

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<th>S.S.</th>
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<th>E.S.</th>
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<tr>
<td>59.9</td>
<td>49.8</td>
<td>42.8</td>
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*Note: WAS > 2 Kt.*
G.O. MOS equation to forecast CONUS surface winds at any location. Predictors 1 through 19 are all terms taken from NMC's LFM. Predictors are in the same order as the screening regression solution used. Abbreviations used are East-West wind component (U), North-South wind component (V), boundary layer (BL), and relative humidity (RH). The predictors were either unsmoothed or passed through a five-point filter as noted by the numbers in parentheses.

<table>
<thead>
<tr>
<th>Projection Hour</th>
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<th>Coefficients</th>
<th>V-component</th>
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**DATA SIZE = 90357**

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**CORRELATION COEFFICIENT =**

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Figure 5. Analysis of wind speed biases for the generalized operator MOS equation over the dependent sample. Units are knots. Bias is the mean forecast wind speed minus the mean observed wind speed. Bias is computed at each location separately and contoured. Shaded area is negative bias. Clear area is positive bias.