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AN OBJECTIVE AID FOR FORECASTING
STRONG AND GUSTY SURFACE WINDS

at
Paine AFB, Washington

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Revised June 1963

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INTRODUCTION

Forecasting the occurrence of operationally critical values of strong surface winds with accompanying gusts presents a major problem at Paine AFB, Washington. This investigation was conducted to develop an objective aid for forecasting such critical values. (Revised June 1963)

THE PROBLEM

The problem concerns the forecasting of strong southwesterly (see comments) surface winds with gusts greater than 25 knots during the months of December through March.

    1. Observation times from which forecasts are made: 0000Z and 1200Z.

    2. Valid period of forecast: 6 to 12 hours after each forecast is made.

PERIOD OF DATA AND ANALYSIS CONDUCTED

The data sample used in this study included selected months December through March, 1956 through 1960. (See comments) The criteria to be met and the attached diagram are self-explanatory and their use is discussed under "Procedure."

COMMENTS

    1. Since a limited amount of data were used in the preparation of this technique, it may or may not prove to contain a representative sample. It rests with the user continually to add current data and refinements through experience to increase its accuracy and usability.

    2. In order to prepare properly an objective method of this type, it is necessary to work with an exact statement of the problem. This must contain definitely established meteorological and time limits. However, the final product is not so sensitive that it will always cut on and off exactly within the limits specified. We observed on several occasions that the method gave "near misses" which were sufficiently close to be of value to the operational forecast. Information, other than that evidenced by a statistical verification, can be obtained through the forecaster's interpretation of the results of this type of study; i.e., it is recommended that the main role of this objective aid be that of a guide and that it be modified by the forecaster in those cases where he has information other than that used by the technique.

    3. This technique is not reliable for forecasting winds with an easterly component.

FORECAST CHECKLIST

Data Required

(a) ZT (Port Hardy) sea-level pressure   _____

(b) PDX (Portland) sea-levle pressure   _____

(c) TCM (McChord) sea-levle pressure   _____

(d) (PDX - TCM)pp   _____

(e) TTI (Tatoosh) sea-level pressure   _____

(f) (TCM - TTI)pp   _____

(g) PAE (Paine) sea-level pressure   _____

(h) (PAE - ZT)pp   _____

(i) MSO (Missoula) sea-level pressure   _____

(j) (MSO - TTI)pp   _____

Procedure

Steps in this procedure are sequential and must be followed in the order listed.

Step No

1. If ZTpp > 1022.8 mbs, forecast "no" and stop   _____

2. If (PDX - TCM)pp < +0.4 mbs, forecast "no" and stop   _____

3. If (TCM - TTI)pp > +6.0 mbs, forecast "yes" and stop   _____

4. If (PAE - ZT)pp < +2.8 mbs, forecast "no" and stop   _____

5. If (MSO - TTI)pp > +16.5 mbs, forecast "yes" and stop   _____

6. If (MSO - TTI) pp < +6.0 mbs, forecast "no" and stop   _____

7. If none of the above criteria are satisfied, use Diagram I. If

case falls in Area "A," forecast "yes," and if in Area "B," forecast "no."

$(MSO \cdot T - TI)_{PP}$ (in Mbs)

$(PAE - ZT)_{PP}$ (in Mbs)

AREA "B" (in)

DIAGRAM I

X = occurrence
X,X = two occurrences

Amoc AFB

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