

Letter to the Editor

551.577.3: 551.562(548.4)

FORECASTING PENTAD RAINFALL ANOMALY OVER COASTAL ANDHRA PRADESH IN JULY

1. Lund and Wahl (1955) and Jagannathan and Ramamurthi (1963) have exhaustively described the use of contingency techniques in short and medium range forecasting. The same technique was applied by the author (Shukla 1967) for forecasting the pentad rainfall of Konkan coast area. The present work is an extension of the same technique for coastal Andhra Pradesh taking the four stations, Masulipatam, Kakinada, Visakhapatnam and Calingapatam, into consideration.

2. *Classification of predictand rainfall anomaly*— If A1, A2, A3 and A4, and S1, S2, S3 and S4 are respectively the lower limits of abnormal and upper limits of subnormal rainfall for the aforesaid four stations the new limits for the whole area will be (A1 + A2 + A3 + A4) and (S1 + S2 + S3 + S4) respectively and, therefore, in order to fix the character of rainfall anomaly of the whole area, the sum of five-day mean rainfall of all the four stations, *i.e.*, R1 + R2 + R3 + R4 will be compared with these new limits.

3. *Predictors used in the study*— The following significant antecedent predictor pairs have been chosen for the graphical correlation with the rainfall anomaly over the area.

(1) 5-day mean 700-mb contour height at 30°N, 65°E and 17.5°N, 97.5°E during the preceding pentad.

(2) 5-day mean 700-mb contour height during the preceding pentad at 17.5°N, 97.5°E and 700-mb contour height at 12.5°N, 82.5°E on the day preceding the forecast pentad.

(3) 5-day mean contour height during the preceding pentad at 30°N, 65°E and 700-mb contour height at 17.5°N, 97.5°E on the day preceding the forecast pentad.

The predictor parameters have been chosen by the composite-charts-method (Jagannathan and Ramamurthi 1963).

4. *The final forecast scheme and verification*— Corresponding to the three predictor pairs mentioned above, Figs. 1, 2 and 3 give respectively

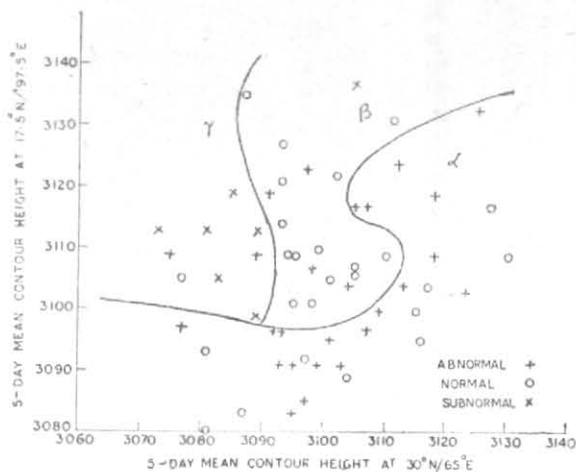


Fig. 1

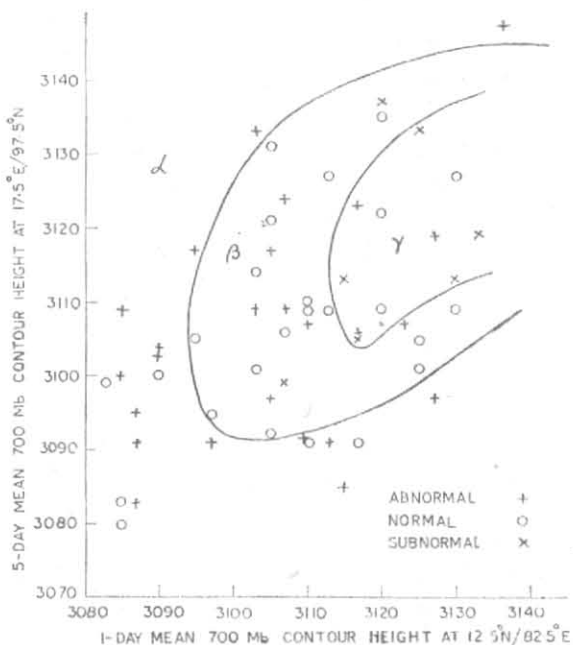


Fig. 2

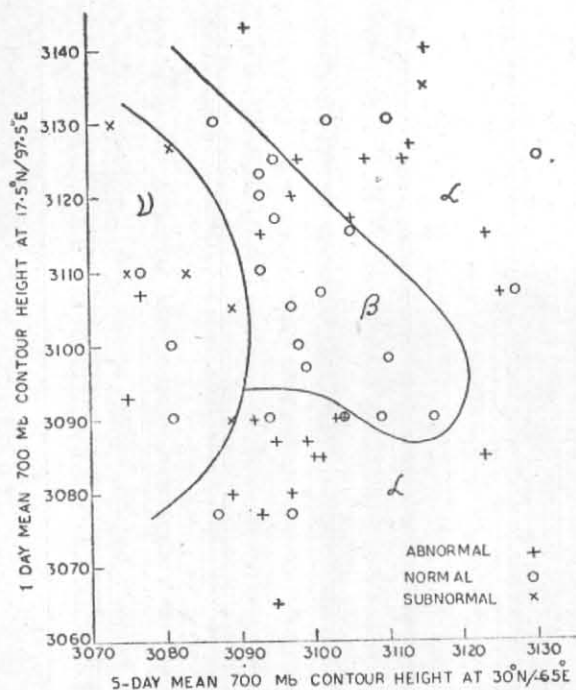


Fig. 3

TABLE 1

Values of $(10 + \log_{10} R'_{ij})$ based on data for the period, 1957-1961

Predictor pair	Predictor class	Rainfall anomaly		
		Abnormal (A)	Normal (N)	Subnormal (S)
I Mean 700-mb contour height at 30°N/65°E and at 17.5°N/97.5°E during the preceding pentad	α	10.2180	9.8459	9.4409
	β	9.6519	10.2397	9.8194
	γ	9.7842	9.6378	10.0749
II Mean 700-mb contour height during the preceding pentad at 17.5°N/97.5°E and at 12.5°N/82.5°E during the immediately preceding day	α	10.2378	9.7746	9.5889
	β	9.7372	10.1987	9.8844
	γ	9.8339	9.8339	10.3414
III Mean 700-mb contour height at 30°N/65°E during the preceding pentad and at 17.5°N/95.5°E during the immediately preceding day	α	10.2589	9.6636	9.6690
	β	9.4545	10.3006	9.6690
	γ	9.7046	9.8339	9.8763

the three scatter diagrams from which three contingency tables were prepared. With the help of these contingency tables, values of $(10 + \log_{10} R'_{ij})$ have been computed and tabulated in Table 1.

Here,

$$R'_{ij} = 1 + (R_{ij} - 1) (k l f_{ij}^{\circ} / N_0)^{1/2}$$

The notations have their usual meanings (Jagannathan *et al.* 1963).

In conjunction with the Figs. 1, 2 and 3, Table 1 will be used for the routine operational purpose. Taking the values of the first pair of predictor parameters for the current pentad, it

will be found from Fig. 1, whether the point falls in the area α or β or γ . Values of $(10 + \log_{10} R'_{ij})$ are noted down for A, N and S for the area in which the point has fallen. The same thing is repeated with the other two diagrams (Figs. 2 and 3) also. Finally all the three values of $(10 + \log_{10} R'_{ij})$ are added (being logarithm) separately for the three classes A, N and S. The class, for which the sum is highest, will be the forecast class.

The validity of the technique has been tested with the independent data of 1962-63 and the forecast obtained by the method is found to be correct in 67 per cent of cases.

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