551·577·37 : 551·578·1(547·1)

AN OBJECTIVE METHOD FOR QUANTITATIVE ESTIMATION OF ABNORMAL PENTAD RAINFALL OVER RATNAGIRI DURING THE MONTH OF JULY

Following the contingency technique in short and medium range forecasting by Jagannathan and Ramamurthy (1963), and by studying the contrasting height contours of the 700-mb surface for subnormal and abnormal pentad rainfall anomaly over Ratnagiri for a period of 7 years (1957-1963), contour heights over specific grid points were found suitable as prediction parameters. These are : 5-day mean 700-mb contour heights at 20°N, 65°E and at 25°N, 80°E during the preceding pentad; also 700-mb contour height at 27·5°N, 77·5°E, and at 12·5°N, 92·5°E on the day just preceding the pentad for which the rainfall is to be forecast.

By using these predictors, two prediction diagrams have been prepared from which quantitative approximation to the pentad rainfall can be made. Figs. 1 and 2 have been designated as prediction diagrams and quantitative approximation to the pentad rainfall of the next pentad can be made by averaging the amounts obtained from the two prediction diagrams, corresponding to the predictor values at the given points for the current pentad. These prediction diagrams can be used only after it has been established that the trough axis position would be at or south of 25°N in the next pentad. As it was noticed that a majority of cases of abnormal rainfall over Ratnagiri is associated with the trough axis position to the south of 25°N. The prognostication of the trough axis position in the next pentad is done by a technique developed by D. A. Mooley. The parameters to be used, in conjunction with Fig. 3, are the trough axis position on the last date of the current pentad along 75°E, and the mean of the change in contour height from the middle day to the last day of the current pentad for the four points at 7·5°N, 77·5°E; 10°N, 75°E; 15°N, 75°E; and 17·5°N, 72·5°E.

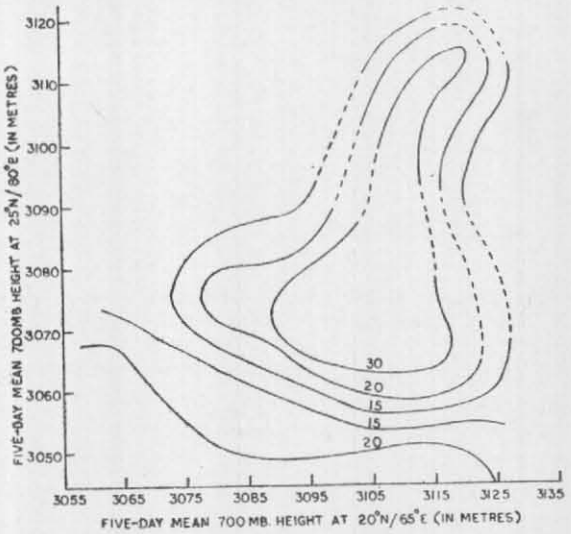

Fig. 1. Prediction diagram

(Rainfall amounts for subsequent pentad in cm.)

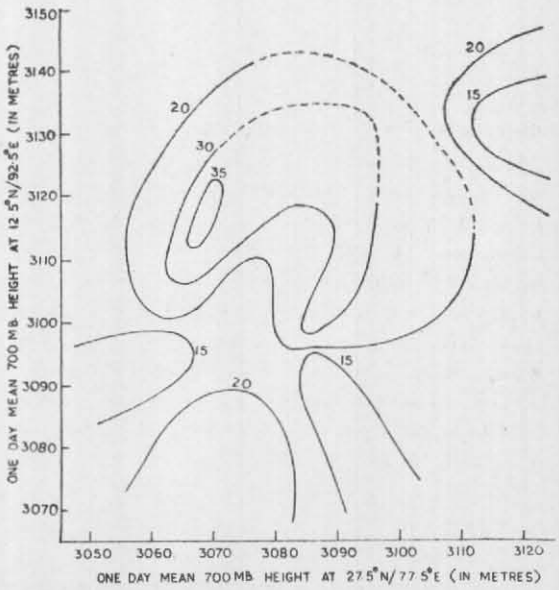

Fig. 2. Prediction diagram

(Rainfall amounts for next pentad in cm.)

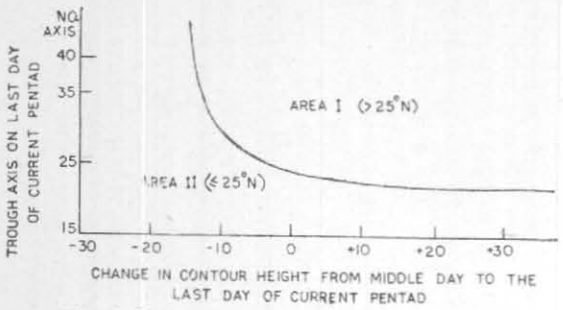

Fig. 3. Prognostication of trough axis position on longitude 75° E

The accuracy of the prediction diagrams has been tested with independent data of 3 years (1964-66). 14 cases of abnormal pentad rainfall anomaly were picked up for July and values of the 4 predictor parameters were found out by averaging the daily heights of 700-mb surface for the antecedent 5-day periods. With the help of these values, the forecast rainfall was found out from the prediction diagrams for these 14 cases. It was seen that out of 14 cases of observed 'abnormal' rainfall anomaly the actual amount of pentad rainfall differed from the 'forecast' one by <5 cm on 9 occasions and by <10 cm on 11 occasions giving a success of 78 per cent; forecast rainfall was 15 cm more on 1 occasion and less (>20 cm) in 2 cases.

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REFERENCE

Jagannathan, P. and Ramamurthy, K. M. 1963 Contingency technique applied to Medium Range Forecasting of rainfall during the monsoon season of India, *Aust. Met Mag.*, 41.