

新店溪流域颱風定量降雨預報之研究

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摘 要

颱風雨量係由兩種降雨相加而成，一為環流雨，另一為地形雨；環流雨係因颱風四周低層高濕高溼空氣向颱風中心輻合上升，以致所含水汽冷卻凝結下降而形成，地形雨則係進行中之颱風氣流受山脈阻擋被迫抬升而形成。

本研究即根據水汽保守定律 (the law of conservation of moisture) 和 Fuks 的降雨公式為颱風輻合作用和地形舉升作用而發生降雨的基本理論，並考慮新店溪流域與颱風中心之相關位置，颱風侵襲期間集水區的風場變化，大氣之水汽含量，颱風路徑和強度變化，以及該流域各方位的地形有效坡度（利用五萬分之一地形圖計算）等因素，配合過去十一年颱風侵襲期間集水區的逐時面積雨量資料，設計符合新店溪流域特定地形的颱風定量降雨預報之作業模式，以便氣象預報人員能於極短的時間內，正確的預測各種不同路徑的颱風於侵台期間，新店溪流域的逐時面積雨量及總雨量和洪峯時間，其結果可提供台灣省水利局淡水河洪水預報中心、台北市工務局養護工程處防汛工作隊、台北市翡翠水庫管理局和台北縣市警察局消防大隊等單位，於颱風期間研擬台北都會區防洪運轉和防災救災工作之參考依據。

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A study of Typhoon Quantitative Precipitation Forecasting over Hsin-Tien Watershed

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Abstract

Typhoon precipitation consists of circulative and topographic rains. The formation process of circulative rain is believed that the convergent updraft of warm and moist air rises sharply toward the typhoon center, resulting in cooling, condensing and falling of the moisture. The topographical rain is believed that the proceeding typhoon air current is hindered by mountains and then forced to rise rapidly.

In this study, an intensive analysis of rainfall data over Hsin-Tien watershed for the period of 1975-1985 has been carried out first, and then, on the basis of law of conservation of moisture and Fulks' scheme of precipitation intensity, the rainfall forecasting model is designed to simulate precipitation over Hsin-Tien watershed. Moreover, in order to check this model, some individual cases are used so as to evaluate its feasibility. On the other hand, some essential factors, such as the relative position of this watershed and typhoon center, wind field variation, moisture content of the atmosphere, the variation of typhoon tracks and intensity, and the effective slope of every direction in this watershed during the invasion periods in Taiwan are all taken into consideration.

It is proved that the rainfall forecasting model is applicable to the typhoon rainfall forecasting over Hsin-Tien watershed, and the results of the said application can be used as an important reference to the authorities concerned.

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