米克拉颱風(2026)肇生北臺灣局部地區強降水之研究

A Study of the Heavy Rainfall Induced by Typhoon Mekkhala (2026) over Localized Areas of Northern Taiwan

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摘　　要

2026年第7號颱風米克拉於6月24至27日從台灣東部近海快速通過，其中心雖未登陸臺灣，但外圍環流經過台灣東部近海時，於台灣北部及西南部局部地區產生強降水，並造成多地淹水和災情。其中6月25日北臺灣局部地區強降水中，新北市單日雨量171 mm、鞍部148.5 mm、臺北市亦多達110 mm。這使得台北市內湖區及大安區多處道路產生50公分以上的淹水情形。由於北台灣25日超過200 mm以上的強降水區域，呈現西北至東南，以及東西走向的罕見降水分布情形，本研究初步以AI大氣模式（FCN）、探空資料、ERA5、邊界水氣收支分析與移除颱風等方法，分析此次造成北臺灣強降水之環境特徵。初步研究結果顯示，新北測站6月25日對流可用位能(CAPE)約800–1200 J/kg、低層與中層風速同步增強且風向呈現西北西風，顯示測站上空明顯受到颱風外圍環流影響。移除颱風渦旋後，背景環境風場仍呈現明顯西南氣流，配合水氣收支分析顯示，北台灣西測及南側邊界持續有淨水氣流入，顯示此次降雨主要由颱風外圍環流與既有西南季風水氣輸送共伴增強所致，而非颱風本體雨帶直接造成。整體結果顯示，未登陸颱風可以透過外圍環流與西南季風共伴作用，在整體為低壓帶有助於對流產生的環境下，使北臺灣發生局部性強降水。

關鍵詞：米克拉颱風、強降水、外圍環流、西南氣流。

Abstract

Typhoon Mekkhala (No. 7 of 2026) passed rapidly through the waters east of Taiwan from June 24 to 27. Although its center did not make landfall in Taiwan, its outer circulation affected the waters off eastern Taiwan and produced localized heavy rainfall in northern and southwestern Taiwan, resulting in flooding and related damage in several areas. During the heavy rainfall event in northern Taiwan on June 25, daily rainfall totals reached 171 mm in New Taipei City, 148.5 mm at Anbu Station, and 110 mm in Taipei City. Flooding depths exceeding 50 cm were reported on several roads in the Neihu and Da'an districts of Taipei City. On June 25, areas of northern Taiwan with daily rainfall totals exceeding 200 mm exhibited an unusual spatial distribution oriented along both northwest–southeast and east–west axes. This study therefore conducted a preliminary investigation of the environmental conditions associated with the heavy rainfall event using the AI-based weather prediction model FourCastNet (FCN), atmospheric sounding observations, ERA5 reanalysis data, boundary moisture budget analysis, and a typhoon vortex removal technique. The preliminary results show that the convective available potential energy (CAPE) at the Banqiao sounding station reached approximately 800–1,200 J kg^{-1} on June 25. Wind speeds in both the lower and middle troposphere increased simultaneously, while the wind direction shifted to predominantly west-northwesterly, indicating that the atmospheric column over the station was strongly influenced by the typhoon's outer circulation. After the typhoon vortex was removed, a distinct southwesterly flow remained in the background wind field. The moisture budget analysis further showed persistent net moisture inflow across the western and southern boundaries of northern Taiwan. These results suggest that the heavy rainfall was mainly caused by the combined effects of the typhoon's outer circulation and the pre-existing southwesterly monsoonal moisture transport, rather than by rainbands directly associated with the typhoon core. Overall, the results indicate that a non-landfalling typhoon may still produce

localized heavy rainfall in northern Taiwan through its interaction with the southwesterly monsoon, particularly within a broad low-pressure environment favorable for convective development.
Key words: Typhoon Mekkhala, heavy rainfall, outer circulation, southwesterly flow.