雲林縣氣候變遷情境颱風事件淹水風險探討

Inundation Risk Assessment of Typhoon Events under climate change in Yunlin County

國家災害防救科技中心、國家高速網路與計算中心

佐理研究員	佐理研究員	副研究員	研究員
蕭逸華	陳俊哲	許至璁	李欣輯
Yi-Hua Hsiao	Chun-Che Chen	Chih-Tsung Hsu	Hsih-Chi Li

摘　要

根據行政院農業委員會統計 110 年農耕土地面積，雲林縣總計面積約 79,678 公頃，佔了該縣總面積的 61.73%，主要盛產稻米、落花生，以及不結球白菜、甘藍、馬鈴薯、紅蘿蔔、茂谷柑等各式蔬菜水果作物，為臺灣的農業重鎮。其中稻米成熟期、雜糧與蔬果容易因颱風降雨及淹水災害泡水而造成損失；且雲林縣長期因地層下陷影響，亦經常發生淹水災情，如 2009 莫拉克颱風、2013 康芮颱風、2017 尼莎暨海棠颱風、2018 0823 熱帶低壓、2021 盧碧颱風等。故本研究應用氣候變遷情境颱風事件資料進行雲林縣未來淹水災況模擬，評估未來可能帶來之淹水風險。

使用的氣候變遷資料為 RCP8.5 動力降尺度 HiRAM-WRF 之颱風事件，包含基期(1979-2008)149 場、世紀中(2040-2065)450 場、世紀末(2075-2099)214 場，應用 SOBEK 模式針對上述颱風事件進行模擬，並計算每一個時期中在雲林縣發生淹水深度 0.5 公尺以上的淹水機率。分析結果顯示各時期淹水發生機率平均值，基期 11.9%、世紀中 13.7%、世紀末 16.5%，可看出淹水發生機率有逐漸提升的趨勢。由此得知，未來颱風事件強度有增加的趨勢，帶來的淹水災害也隨之提升，可能導致農作的損失，可藉由本研究成果進行後續相關地區之減災與調適評估，提早防範，避免更嚴重的災害發生。

關鍵詞：氣候變遷，雲林縣，淹水

Abstract

According to the 110-year agricultural land area statistics of the Council of Agriculture, Executive Yuan, the total area of Yunlin County is about 79,678 ha, accounting for 61.73% of the total area of the county. It is mainly rich in rice, groundnuts, as well as bok choy, cabbage, potatoes, carrots, Murcott and other vegetable and fruit crops. It is an important agricultural town in Taiwan. The mature stage of rice, grains, vegetables and fruits are prone to losses due to typhoon rainfall and inundation disasters. In addition, due to the influence of stratum

subsidence for a long time, inundation often occurs in Yunlin County. For example, Typhoon Morakot in 2009, Typhoon Kong-rey in 2013, Typhoon Nesat and Haitang in 2017, Tropical Depression 0823 in 2018, Typhoon Lupit in 2021, etc. Therefore, this study uses the typhoon events data under climate change to simulate the flooding situation in Yunlin County, and evaluate the possible inundation risk in the future.

The climate change data used is RCP8.5 dynamic downscaling HiRAM-WRF typhoon events, with a total of 149 in the base period (1979-2008), 450 in the middle of the 21st century (2040-2065) and 214 in the end of the 21st century (2075-2099). The SOBEK model was used to simulate the above typhoon events, and the flooding probability in Yunlin County at a depth of more than 0.5 m was calculated in each period. The analysis results show that the average probability of inundation in each period is 11.9% in the base period, 13.7% in the middle of the 21st century, and 16.5% at the end of the 21st century. It can be seen that the probability of inundation has a gradually increasing. In the future, the intensity of typhoon events will increase, and the inundation disasters will also increase, which may lead to the loss of farming. Based on the results, follow-up assessments of disaster reduction and adaptation in relevant areas can be carried out to avoid more serious disasters.

Keywords: climate change, inundation, Yunlin County