

發展風暴潮影響強度分析法以重建1845雲林口湖 風暴潮事件

Developing the storm surge impact intensity analysis method and reconstructing the 1845 Kouhu storm surge event

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摘 要

西元1845年雲林口湖發生嚴重之風暴潮事件，造成萬人喪生，為台灣歷史上最嚴重之風暴潮事件。為重建1845口湖風暴潮事件，本文發展風暴潮影響強度分析法（SSIIA）。該法以現行於中央氣象局之COMCOT-SS 風暴潮模式為基礎，進行大量單元颱風之風暴潮模擬，以建立颱風位置對風暴潮與溢淹高程之SSIIA敏感關係圖。本研究為重建颱風路徑，發展颱風路徑對風暴潮影響分析法。該法透過SSIIA之分析結果進行分析，以求得可能之颱風路徑組合，再考慮颱風移動速度之差異性，得出最嚴重影響行進速度之路徑，最後由該結果建立1845年事件之可能情境路徑。並以COMCOT-SS風暴潮模式，模擬該情境路徑所生成之風暴潮。最終將所模擬之結果與歷史文獻記載比對，以獲得結論。本研究所建立之分析方法，可系統性分析沿海低窪地區之風暴潮溢淹潛在災情，有助於進行風暴潮風險評估及災防規劃。

研究結果顯示，根據SSIIA圖各單元颱風源對雲林縣口湖鄉之高影響位置皆位於口湖或口湖北部一帶。而位於北緯22.7度以南之地區，由於其對於口湖造成持續之離岸風影響，導致該區域單元颱風之影響較低；根據颱風路徑對風暴潮影響分析可知，SSIIA法分析範圍以外之颱風路徑，其颱風路徑對風暴潮敏感性大幅降低至可忽略之程度。

關鍵字：風暴潮影響強度分析法SSIIA、颱風路徑、口湖風暴潮、COMCOT風暴潮模式、風暴潮重建

Abstract

In 1845, a severe storm surge occurred at Yunlin Kouhu, killing thousands of people, making it the most powerful storm surge event in Taiwan's history. This research develops the storm surge impact intensity analysis method (SSIIA) to reconstruct the 1845 Kouhu storm surge. This method is based on the currently operating COMCOT-SS storm surge forecast model in the Central Weather Bureau. It conducts many simulations to establish the SSIIA sensitivity map of typhoon location to storm surge and inundation.

According to the SSIIA map, the study results show that the high-impact typhoon sources in the study area in Yunlin are all located in Kouhu or the northern part of Kouhu. However, in the area south of 22.7 °N, due to its continuous offshore wind impact on Kouhu, typhoons' effects in this area are relatively low. Furthermore, compared to the worst-case, influences from the racks outside the SSIIA region are negligible, and various typhoon forwarding speeds have similar results to the flooding zone in Kouhu.

The analysis method established by this research can systematically analyze the potential disasters of storm surge flooding in low-lying coastal areas, which is helpful for storm surge risk assessment and disaster prevention planning.

Key words: Storm Surge Impact Intensity Analysis Method (SSIIA), Typhoon Track, Kouhu Storm Surge Event, COMCOT-SS, Reconstruction of Storm Surge.