

# 沿海地區氣候變遷風險評估方法探討

## Discussion on Risk Assessment Methods for Climate Change in Coastal Areas

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### 摘 要

全球升溫導致的極端化降雨型態提高沿海低窪地區淹水的機率，而海平面上升可能加劇此現象，受暖化導致的沿海地區風險是具有全球尺度的重要議題。臺灣擁有 1200 公里的海岸線，東部海岸坡降陡峻距岸邊不遠處即為深海，而西部海岸坡度較緩容易受到海平面及暴潮影響，尤其彰化以南之沿海地區更容易受到衝擊，例如海平面上升導致的溢淹、海岸侵蝕加劇或海岸線後退等等問題，所以評估氣候變遷導致的海平面上升問題對於臺灣這種四面臨海的島嶼國家至關重要。過去數十年有關單位已針對沿海地區進行調查及規劃，如海岸現況環境資源、海岸防護、海岸保護及永續利用等面向，用以評估應對氣候變遷下之調適能力，包含沿海地區海岸災害的衝擊模擬、脆弱度和風險評估。本研究針對海岸議題進行資料盤點以釐清範疇及對象，如海岸相關法規及圖資蒐集，初步選定雲林地區作為評估方法建立及測試地區，探討氣候變遷情境升溫 2°C 下可能之風險。海平面上升模擬資料採用 TCCIP 計畫提供由動態天文潮汐 (Dynamic Astronomical Tide, DAT, Hsiao et al., 2022) 方式，推估海平面上升造成的溢淹範圍，再嘗試結合不同脆弱度與暴露度指標，評估海平面上升可能影響範圍及相應之危害、脆弱、暴露等風險等級分類以初步完成風險評估架構建置，希冀可作為氣候變遷情境下沿海地區的可能衝擊評估的方法。

關鍵詞：氣候變遷，海平面上升，海岸，風險評估

## **Abstract**

The extreme rainfall patterns caused by global warming increase the likelihood of flooding in low-lying coastal areas, and sea level rise may exacerbate this phenomenon. The risks to coastal areas due to warming are a critical global issue. Taiwan has a 1,200-kilometer coastline, with the eastern coast characterized by steep slopes that drop off quickly into deep sea, while the western coast has gentler slopes that are more susceptible to sea level rise and storm surges. The western coastal regions of Taiwan are particularly susceptible to the impacts of climate change, such as flooding caused by sea level rise, more severe coastal erosion, and shoreline retreat. Assessing the impacts of climate change-induced sea level rise is crucial for Taiwan, an island nation. Over the past decades, relevant authorities have conducted investigations and planning regarding coastal issues, such as the current state of the coastal environment, coastal protection, and sustainable use. These efforts aim to assess and enhance the adaptive capacity to climate change, including impact simulations of coastal disasters in coastal areas, as well as vulnerability and risk assessments. This study focuses on coastal issues by conducting a data inventory to clarify the scope and subjects and collecting the necessary geographic information, including coastal-related regulations and data. Yunlin County was chosen as a demonstration area to explore potential risks under a global warming scenario of 2°C. Sea level rise simulation data was provided by the TCCIP project, using the Dynamic Astronomical Tide (DAT, Hsiao et al., 2022) method to estimate the coastal inundation range due to sea level rise. The study also attempts to combine vulnerability and exposure indicators to assess the potential impact range of sea level rise and to classify risk levels such as hazard, vulnerability, and exposure. Through this process, a risk assessment framework is established, aiming to serve as a reference method for evaluating coastal area impacts under climate change scenarios.

**Keywords :** Climate Change, Sea Level Rise, Coastlines, Risk Assessment