因應氣候變遷之海岸風險評估(1/2)

Assessment of coastal risks to climate change-related impacts(1/2)

主管單位：經濟部水利署

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摘要

為因應氣候變遷衝擊海岸，需針對防災策略及衝擊評估進行深入探討。本計畫主要針對海岸韌性防災案例、國內歷史災害案例、氣候變遷情境分析及氣候變遷衝擊評估等項目進行研討，並彙整國外海岸韌性防災案例，研提具體在地化建議，且蒐集國內歷史災害案例資料，進行分析以瞭解各事件致災之情況與原因。另需辦理氣候變遷情境條件蒐集與分析，並配合數值模式進行衝擊評估模擬，且再實行海岸風險地圖之重新繪製。

已針對各國(美國、日本、紐西蘭及荷蘭)進行「海岸韌性」防災資料蒐集，並概述各國針對海岸韌性提升所實行之辦法與評估方式，並於本年度計畫選定「荷蘭」做為案例分析之對象。除韌性評估方法蒐集分析外，亦有針對荷蘭目前針對海岸韌性提升所執行的改善對策資料進行彙整，並以國內目前針對海岸災害之「評估方法」研提納入韌性因子相關建議，及針對本年度計畫區域提供改善對策之建議。透過已調校後的數值模式進行各計畫區氣候變遷衝擊評估，先以海洋模式，配合海象情境條件進行基期與近未來暴潮溢淹模擬，並萃取近岸區域河口水位與越波水位資訊後，提供淹水模式做為下游邊界，再由淹水模式完成海岸溢淹災害衝擊評估。其成果顯示，降雨與暴潮同時影響下，淹水大幅增加的原因，應為河川與排水系統的下游水位受到暴潮的頂托，排水能力大幅下降，上游山區降雨逕流流入河道的水量無法宣洩，使得河道水位高漲；同時若降雨同時發生在平地區域，將導致地表漫地流無法順利排入區排之中，最終造成內水淹水的範圍、深度、以及延時同步增加。考量現況環境與氣候變遷衝擊成果，分別繪製基期(現況)與近未來情境下，海岸災害風險地圖。其中，脆弱度中的堤前波高資訊與危害度中的溢淹資訊，亦有依據本計畫模擬成果更新，暴潮溢淹因子亦以考量現有海堤情況給予條件，以利繪製較符合現況的海岸風險地圖。

關鍵詞：氣候變遷、海岸風險評估、海岸韌性

Abstract

In order to deal with the impact of climate change on the coast, discussions on disaster prevention strategies and impact assessments are needed. This project focuses on case studies for coastal resilience disaster prevention and domestic historical disaster, and scenario analysis and impact assessment for climate change. Besides, the overseas coastal resilience

disaster prevention, the specific suggestions for Taiwan, the collection of domestic history disaster case data, are analyzed. It is also necessary to collect and analyze the climate change conditions, to cooperate with numerical models for impact assessment simulation, and implement the redrawing of coastal risk maps.

The coastal resilience from the United States, Japan, New Zealand, and the Netherlands are collected. The Netherlands is selected this year. In addition to the collection and analysis of the assessment method, there is also a compilation of data on the improvement measures currently implemented by the Netherlands for the improvement of coastal resilience. Finally, the recommendations for the current assessment method in Taiwan to include the resilience index is proposed. Using the adjusted numerical model to evaluate the impact of climate change in each project area. The ocean model considered the base period and near future storm surge conditions to provide downstream boundaries for the flooding model. Then, the disaster impact assessment will be completed by the flooding model. Under the simultaneous influence of rainfall and storm surge, the reason for the drastic increase in flooding should be that the downstream water levels of the river and the drainage system are supported by the storm surge, and the drainage capacity is greatly reduced. At the same time, if rainfall occurs in flat areas, the ground surface current cannot be smoothly discharged into the zonal discharge, and eventually the scope, depth, and time delay of internal flooding increase simultaneously. Finally, considering the impact of the current environment and climate change, a map of coastal disaster risk in the base period and near-future scenarios is drawn. Among them, the wave height in front of the dike and the flood in the hazard are also updated based on the simulation results of this plan, and the storm surge flood factor is also given in consideration of the existing seawall conditions to facilitate the mapping to derive the current situation coastal risk map.

Keywords：climate change, coastal risk assessment, coastal resilience