

摘要

中央氣象局分析台灣過去 100 年氣象資料指出，各地平均溫度均已上升，氣候異常變化致使驟雨、洪澇、乾旱等現象更為頻繁；2009 年莫拉克颱風攜帶超大豪雨重創台灣，南部區域降雨量多數達頻率 200 年之一日暴雨量，以致許多地區有極大崩塌災害。其中河道堆積問題影響河岸保全對象之安危，如何量化堆積土砂量及排定河道清疏順序，實為災後復建所需之重要工作。

本研究以濁水河流域清水溪支流阿里山溪為試區，推估莫拉克颱風後主、支流各河段之泥砂產量，其泥砂產量為土壤流失量與崩塌量兩者遞移之和。使用通用土壤流失公式及修正 Khazai and Sitar 法配合泥砂遞移率概念求出各河段之泥砂產量，並考量集水區範圍內之保全對象，優選主流河道清疏區位，期可供集水區治理規劃之參考。

阿里山溪集水區於莫拉克颱風時崩塌量約為 3,891 萬立方公尺，未輸出土砂量約為 3,635 萬立方公尺，造成河道嚴重堆積，主流以接近源頭之 C04—C05 河段堆積最為嚴重；支流則以 C04—C05 河段之 T08(科子林溪)因崩塌量最嚴重以致對主流土砂貢獻量最多；考量各河段未輸出土砂量及保全對象之相對權重，則以最接近集水區出口之 C10—C11 河段為最需優先進行河道清疏作業之區位、C08—C09 及 C04—C05 河段並列為第二序位、C09—C10 河段為第三序位。

關鍵詞：河道清疏、優選區位、崩塌土砂量

Abstract

According to analyzed over past 100-year's meteorological data, Central Weather Bureau indicated that average temperature is on the rise everywhere and climate changes extraordinary causing storms, flooding and droughts occurred frequently. Typhoon Morakot carried torrential rain struck Taiwan in 2009, and the daily rainfall in most of southern Taiwan up to 200-return period caused several landslide calamities. It is a vital recovery task to realize the landslide status and assess dredging priority of creek section suffered from Typhoon Morakot.

A-li-shan Creek, tributary of Qing-shui Creek, is used as the experimental site to calculate the sediment yield of each river section divided by the intersections of main stream and tributaries. Sediment yield in each river section is estimated by the amount of watershed debris delivery, which involves yields of soil loss and landslide. Universal soil loss equation, Khazai and Sitar modified method and the concepts of sediment delivery ratio were all applied in this study to explore the dredging priority of creek section under consideration of security objects for the reference of watershed planning and management.

Results show that tremendous landslides occurred in the interested watershed during the strike of Typhoon Morakot. The total amount of landslide volume is about $3.891 \times 10^7 \text{ m}^3$ and the potential sediment yield is $3.635 \times 10^7 \text{ m}^3$ in the watershed. Section #C04—C05 along main stream shows the most serious deposition, section #T08 at the Ke-zai-lin Creek contributes the most debris volume to main stream. The dredging priority of creek section is # C10—C11, # C08—C09 and/or #C04—C05, and # C09—C10 in order calculated from the weighting of potential sediment yield and security objects.

Keywords : Channel dredging, priority site, landslide volume