《論文獎》

東澳嶺崩塌地之地形演育分析

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摘 要 梅姬颱風 (2010) 與東北季風之共伴效應於台灣宜蘭縣蘇澳地區帶來了豐沛降雨，高累積雨量造成了台 9 線蘇花公路群集性土砂災害，尤其在 115.9K 上邊坡更誘發了約 210 萬 m3 之大規模崩塌土砂災害。本文從現地地質調查、致災機制、水文分析及遙測影像判釋等面向進行討論。由降雨-延時-頻率分析得知近年來誘發重大崩塌事件的雨量皆高於 200 年回歸週期，並獲致良好判別致災雨場之 I-R 圖降雨臨界線關係 (Re+53.5Iave=1,146)。多時期遙測影像判釋指出東澳嶺坡頂之弧型張力裂隙仍有持續溯源發展之趨勢。裸露崩塌地不連續面方位密度分布圖之裂隙位態大致與區域地質構造位態 (N70°W) 相近，顯示本區域崩塌主要仍受地質條件主控。此外，蝕溝溯源侵蝕、剪裂帶分布及凹窪坡型亦為影響研究區崩塌地地貌變遷之重要因子，而前期地震或長延時高強度降雨則為外在促崩因子。

關鍵詞：東澳嶺、大規模崩塌、土石流、遙測判釋、剪裂帶。

Geomorphic Evolution of the Dong-Ao Peak Landslide, North Eastern Taiwan

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ABSTRACT Typhoon Megi coupled with the northeastern monsoon induced an extreme rainfall of 939 mm on the Suao area, Yilan County, in eastern Taiwan on October 21st, 2010, causing the Dong-Ao Peak landslide of 2.1 million m3 along the coastal Su-Hua Section of Highway Route 9. This study adopts a geological survey, rainfall data, satellite images, orthophotos, and high-resolution DEM based on airborne laser scanner surveys to quantify the morphological changes before and after landslide events following major rainfall events since 2010. Rainfall frequency analysis indicates the cumulative precipitation triggering landslide events is greater than the 200-year return period. In addition, both the entrainment effect of debris flow and toe erosion on the down-slope is shown to induce regressive sliding failure at the adjacent roadbed. The results suggest that geological factors such as head-cutting erosion and the concave landform shape the landform evolution of the catchment. The occurrence of landslides also depends on antecedent earthquake events and extreme intense rainfalls.

Key Words : Dong-Ao Peak, large-scale landslide, debris flow, remote sensing interpretation, shear zone.

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