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雪霸國家公園林道環境敏感潛勢分析之研究

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摘　　要　臺灣位於亞熱帶季風氣候區及環太平洋地震帶上，每遇颱風或地震即產生崩塌，自然災害發生頻繁。一般而言，國家公園林道經常位於地形高陡之山地當中，基本上就是一個容易發生災害之地區。爲了達到災害防範及降低災害影響程度，瞭解林道災害發生因素以及繪製林道環境敏感潛勢圖（environmentally sensitive potential map, ESPM）則是一項重要的研究課題。然而林道環境敏感影響因子甚多，各因子之時空特性及資料尺度整合不易，無法以數個簡單因子來評估林道災害發生機率，因此本研究主要目的是針對雪霸國家公園提出一個新的林道環境敏感潛勢劃分模式。本研究以 SPOT 遙測衛星影像及相關之空間資料爲基礎，以多變數統計之主成份分析法及最大概似分類法，結合地理統計之指標克利金分類法，於雪霸國家公園內兩條主要林道進行環境敏感潛勢劃分的評估。研究中分別建立林道敏感因素對園區道路與環境影響程度及其相關性，進而繪製林道環境敏感潛勢分級圖，最後以外業調查法進行林道環境敏感潛勢合理性之實地驗證。結果顯示崩塌發生區域多集中在本研究所規劃之危險崩塌、高及中危險的路段當中，因此本研究成果可作爲雪霸國家公園規劃崩塌潛勢的重要參考依據。

關鍵詞：地理統計、克利金估計法、指標克利金分類法、多變數統計、林道環境敏感性。

Research on Environmentally Sensitive Potential Region Analysis for the National Park Forest Road

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ABSTRACT　Taiwan is located in the Pacific Ocean earthquake zone and subtropical monsoon climate district region, It has, frequency natural disaster problems in the typhoon, earthquake, landslides and debris flow. In the national park, the forest roads are always situated in high and steep mountain region. These regions have disadvantageous geology and included many small stream and valley with rapid rivers. To reduce the damage and prevent hazards in Shei-Pa National Park, the problems of how to extract the core factors of forest road damages and to develop a new potential disaster analysis (PDA) for an environmentally sensitive potential map (ESPM) are very important issues. Thus, we collected SPOT satellite images and GIS data (ex: river map, DTM, slope,...and so on) to evaluate the landslide areas between a series of typhoons and earthquakes, and a novel analysis process combining the Principal Component Analysis (PCA), Maximum Likelihood

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Classification (MLC) and Indicator Kriging (IK) methods to extract core factors and classification data for paining road disaster levels. Through this process, we could assess the sensitive factors and their correlation between the forest road and environment factors using the PCA, MLC and IK classification methods. The study results can bring out the characteristics of the landslide and collapse for study sites. Finally, we can successfully develop a natural disaster map for forest roads in the Shei-Pa national park area.

Key Words: geostatistics, Kriging estimate, indicator Kriging classification, multivariate statistics, forest road environmental sensitive potential analysis.