

斜坡單元進行山坡地土壤流失量之推估

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摘要

本研究以斜坡單元為基礎，運用 ArcGIS 中空間分析工具(Spatial analyst tool)擷取通用土壤流失公式(Universal Soil Loss Equation, USLE)各個因子，推估平均土壤流失量，可釐清邊坡年平均土壤流失量，精進網格單元結果不易於現地進行查核及比對之缺點。本研究以南投縣竹山鎮為試區，分析結果顯示以斜坡單元為製圖單元推估 USLE 之年平均土壤流失量為 98.7ton/ha-yr，與使用網格單元推估之年平均土壤流失量為 66.5ton/ha-yr 相比較，兩種單元計算結果相差約 1.48 倍，主要原因係斜坡單元擷取符合地形邊界之坡度及坡長平均值，可減少網格單元固定坡長與坡度極端值造成 USLE 運算上謬誤。此外，斜坡單元年平均土壤流失量結果，除可提供未來山坡地土地可利用限度分類方法研修之外，亦可作為加強保育地更新及查核單元，對未來山坡地土地可利用限度分類、管理與保育應有所助益。

(**關鍵詞**：通用土壤流失公式(USLE)、斜坡單元、網格單元、土壤流失量式)

Application of Slope Unit in Soil Loss Estimation

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ABSTRACT

Slope unit method is used in this study, with the help of spatial analyst tool which in ArcGIS to obtain factors of Universal Soil Loss Equation(USLE). The factors can be used to estimate average

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水土保持學報43(4) : 395 – 410 (2011)

Journal of Soil and Water Conservation , 43 (4) : 395 - 410 (2011)

annual soil loss for each slope unit and improve the shortcomings of grid cells whose results are not easy to check and compare from the field. The study area is located on Jhushan township, Nantou country. The results showed that the average annual soil loss estimated by using slope unit as mapping unit is 98.7ton/ha-yr and 66.5ton/ha-yr by grid cells. The differences between computations of both approaches can approximately arrive 1.48 times. The main reason is that the average values of slope and slope length gained from slope unit can match topographic boundary. Slope unit also can reduce calculation error caused by fitting extreme values of slope and slope length from grid cells. In addition, average annual soil loss from slope unit not only can provide a approach to revise the utilization limitation classification standard of the slopeland but also can be the unit of renewal and investigation of enhancing conserved land. It will be helpful for the classification of slopeland utilization limitation, management and conservation in the future.

(Keywords : USLE, Slope unit, Grid cells, Soil loss)