

## 以衛星遙測與灰預測理論分析九份二山地震崩塌地 先鋒植被之恢復速度與空間分佈

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### 摘要

本研究運用多期 SPOT 衛星資料，探討地震崩塌區生態恢復過程之先鋒植被擴增狀況與其空間分佈，並應用灰理論預測先鋒植物全面覆蓋所需時間。當以線性、指數及多相式迴歸預測先鋒植被恢復到完全覆蓋非岩石區，分別約需 5.2、1.6、與 3.4 年時；灰理論之預測則為 2.0 年，其預測模式為  $x(k+1)=72387.143e^{0.4704}$ 。依現地植被調查顯示，先鋒植被恢復速度可能依循灰預測模式。且其恢復過程有約兩個月之遲滯期。

關鍵詞：衛星資料，地震崩塌區，先鋒植被，灰預測理論，恢復速度。

### ABSTRACT

We applied multiple SPOT satellite data to evaluate the recovery rate of vegetation in the Chiu-Feng-Er mountain landslide area after the Chi-Chi Earthquake. The grey theory was also applied to predict the time required for pioneer vegetation to completely recover the non-rock landslide area and was compared with the results of linear, exponential, and polynomial regression analysis. While complete recovery of vegetation may take 5.2, 1.6 and 3.4 years predicted by the linear, exponential, and polynomial regression analysis, respectively, it may take 2.0 years according to grey analysis. On the basis of ground investigation, the recovery process of pioneer vegetation in Chiu-Feng-Er Mountain landslide may follow the equation of the grey prediction model, i.e.  $x(k+1)=72387.143e^{0.4704}$ . This recovery process exhibited a lag phase of approximately two months.

**Key words:** Satellite data, Earthquake-caused landslide, Pioneer vegetation, Grey prediction model, Recovery rate.