

An index to describe the earthquake effect on subsequent landslides in Central Taiwan

Abstract

Chelungpu fault reactivation produced the 1999 Chi-Chi earthquake in Central Taiwan in 1999, triggering many landslides over a broad area. The ground damage caused by the Chi-Chi earthquake still influences successive rainfall-triggered landslides. The landslide distribution triggered by heavy rainfall during typhoon Mindulle in 2004 has a high correlation to the landslide sites triggered by the previous Chi-Chi earthquake. This research calculated and ordered landslide data for both the area and distance from the Chelungpu fault. The rank correlation coefficient for measuring two covarying variables is employed to quantify the degree of correlation between the landslide distribution and the Chelungpu fault. A high rank correlation coefficient value demonstrates a highly correlated relationship between the subsequent landslides in 2004 and previous Chelungpu fault activity in 1999.

Keyword: Chi-Chi earthquake; Landslide; GIS; Remote sensing; Rank correlation coefficient; Taiwan