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Soil movements and surface erosion rates on rocky slopes in the mountain areas of the karst region of Southwest China

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The karst region of Southwest China with an area of 54 $\times$ 104 km2 is one of the largest karst areas in the world and experiences subtropical climate. Hill-depressions are common landforms in the mountain areas of this region. Downslope soil movement on the ground by surface water erosion and soil sinking into underground holes by creeping or pipe erosion are mayor types of soil movements on rocky carbonate slopes. The 137Cs technique was used to date the sediment deposits in six karst depressions, to estimate average surface erosion rates on slopes from their catchments. The estimates of soil loss rates obtained from this study evidenced considerable variability. A value of 1.0 t km-2 year-1 was obtained for a catchment under original dense karst forest, but the erosion rates ranged between 19.3 t km-2 year-1 and 48.7 t km-2 year-1 in four catchments under secondary forest or grasses, where the original forest cover had been removed in the Ming and Qing dynasties, several hundred years ago. The highest rate of 1643 t km-2 year-1 was obtained for a catchment underlain by clayey carbonate rocks, where the soil cover was thicker and more extensive than in the other catchments and extensive land reclamation for cultivation had occurred during the period 1979–1981, immediately after the Cultural Revolution.