

Impact of earthquake-triggered landslides on catchment sediment yield

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Abstract This study explores the role of seismic activity in explaining spatial and temporal variation in sediment export from the Siret basin in Romania. Based on long-term (>30 years) sediment export measurements for 38 subcatchments, we found that spatial variation in sediment yield (SY) is strongly correlated to the degree of seismic activity and catchment lithology. Combined, these factors explain 80% of the variation in SY. To investigate the role of earthquake-triggered landslides in explaining these correlations, we studied the temporal variability in sediment concentrations before and after the 7.4 M_w earthquake of 1977 for ten subcatchments. Despite the fact that this earthquake triggered many landslides, only one subcatchment showed a clear (3-fold) increase in sediment concentration per unit discharge after the earthquake. This shows that, although prolonged seismic activity strongly controls average SY, individual earthquakes do not necessarily affect sediment export at short timescales.

Key words sediment yield; earthquake; peak ground acceleration; sediment buffering; rating curves; Romania, Siret