

Colluvial deposits in first-order streams and channel head migration by shallow landslides: Case study in granitic basins, Asaminami, Hiroshima, Japan

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Relationship between dates of colluvial deposits and channel-head migration was examined in granitic mountains where a debris-flow disaster occurred in 2014. Topographic analysis using 1-m grid DEMs before and after the disaster indicates that post-event channel heads were located upslope from pre-event channel heads due to landslide or erosion by debris flow. Post-event channel heads with shallow landslides had strong inverse correlations between local slope and drainage area. Charcoal samples were collected in colluvial deposits of two post-event channel heads (A and B) where the channel heads migrated more than 50 m upslope with shallow landslides. The radiocarbon dates of the samples were 1162–1194 y BP for channel head A and 786 y BP for channel head B. Another sample was collected in colluvial deposits of a post-event channel head (C) with shallow landslide but no migration. The radiocarbon date of the sample at the channel head C was 670 y BP. These radiocarbon data explain contrasting intervals of landslide events in hollows. The channel head A with older radiocarbon dates has the longer interval of landslide events and therefore the valley head has been buried in longer distance (more than 50 m) along the channel since the last landslide event to 2014.

Keywords: High-resolution DEM, Micro-topography, Radiocarbon dating, Valley head