

Effect of shallow landslides on migration of channel heads: Case studies in Hiroshima City and Hofu City, western Japan

*Tsuyoshi Hattanji¹, Ryuya Kodama², Daichi Takahashi², Shoji Doshida³, Yasushi Tanaka⁴, Takahisa Furuichi⁵

1. Faculty of Life and Environmental Sciences, University of Tsukuba, 2. College of Geoscience, University of Tsukuba, 3. National Research Institute of Fire and Disaster, 4. Faculty of Letters Komazawa University, 5. Graduate School of Agriculture, Hokkaido University

The temporal variation in channel-head location due to heavy rainfall was examined with topographic analysis using 1-m grid DEMs and field survey in granitic mountains in Hiroshima City and Hofu City where debris-flow disaster occurred during a recent decade. For both cases, the total number of channel heads increased after the heavy rainfall events, and post-event (new) channel heads formed by the heavy rainfall were located upslope from pre-event channel heads. Although pre-event channel heads had no significant correlations between source area and local slope for both areas, post-event channel heads with shallow landslides induced by the heavy rainfall had strong inverse correlations between them. Subsurface flow controlled by topographic convergence would cause the strong inverse correlations for both sites. Most pre-event channel heads were located close to springs fed by groundwater flow, and old landslide scars were confirmed headward slope of the springs. Downstream channels of the springs would be maintained by erosion of stream flow, although old channels would be buried by debris.

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