



Denudation fronts detected by airborne laser scanner

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Mountain slopes develop principally by mass movements, so the history of their development is important to evaluate the susceptibility of landslide and to predict their potential sites. In order to clarify slope development history, essentially important are the identification of landslide scars and the analysis of micro topography, which are now possible by using airborne laser scanner even under the forest. We applied the airborne laser scanner to an area where heavy rainstorms occurred and induced many landslides. We found denudation fronts, along which landslides concentrated.

The investigation site is mountains consisting of alternating beds of sandstone and mudstone of the Cretaceous Izumi Group in Niihama, Shikoku, western Japan, where numerous numbers of shallow landslides were induced by two heavy rainstorms in 2004. We obtained high resolution DEM (Digital Elevation Model) data with a mesh size of 1 m. Landslides by the 2004 events were identified by the photo interpretation and field investigation and then plotted on a detailed map made from the DEM. Landslide scars before these events were clearly identified on the detailed map and also on "topographic image" made from it although they are hidden by forest. The landslide density by the 2004 events was $140/\text{km}^2$ and before the event was $105/\text{km}^2$, indicating that this area have high susceptibility to landslide. The landslides seemed to be randomly distributed, but the high resolution DEM data clearly showed that they were concentrated along convex slope breaks, which are the denudation fronts. Slopes just above the fronts are most susceptible to landslide in future.