



Dating abandoned channels in uplifting mountainous terrains: an approach to reconstruct watershed evolution on the absolute time scale

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River incision and subsequent gravitational slope deformation pose a grave threat of deep-seated landslides in an active orogen. Quantitative linkage between channel and hillslope processes are required for assessment of landslide hazards, which also help reconstruct long-term landscape evolution of the mountainous watersheds. Determination of river incision rates provides a clue to understand transient responses of such channel-hillslope systems to external and/or internal forcing. This study attempts to date fluvial deposits left above the present river by cosmogenic nuclide exposure dating for revealing spatial and temporal history of river incision. Study areas are Shihmen reservoir watershed in northern Taiwan, and Totsukawa watershed in Kii Peninsula, central Japan. Rounded gravels were collected for the cosmogenic Be-10 and Al-26 analyses, from relict channels around meander cores, wind gaps on the catchment boundary, and sediment left on the edge of spurs. Preliminary results from the Totsukawa watershed show ages of ~ 30 ka for gravels at 130-160 m above the current river bed, corresponding to the incision rate of ~ 4 -5 mm/kyr. This rapid incision may have led to the formation of inner gorges in the watershed and resulted in destabilization of the side-slopes along the river.