



Hillslope sediment transport – connecting rainfall with biota

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Sediment is transported by a processes operating at different spatial and temporal scales. Rainsplash and sheetflow operate at the storm or rainfall event scale which has both spatial and temporal dimensions. Other processes such as soil disturbance by animals (biotic disturbance) operate at the point scale and will vary from year to year. Other disturbance processes such as tree throw operate at time scales that are likely to be at least decadal through to centennial. These abiotic and biotic processes all disturb sediment at different spatial and temporal scales. Here we quantify the amount of soil disturbance and redistribution by three different diffusive erosion processes - rainsplash, animal disturbance (by feral pigs) and tree throw (as a result of a cyclonic event). The results show that rainsplash, while being a constant erosional influence each year produces considerable variability in erosion rates at the point scale. Soil disturbance by pigs occurs annually in what appear to be random locations with the pits and exhumed soil present for many seasons post disturbance. Similarly for tree throw, while the event occurs only every 50 to 100 years, the pit mound topography as well as the fallen tree can last for over ten years (and longer) before the disturbance becomes indistinguishable with the surrounding surface. Here we present the findings from ten years of field observation quantifying the amount of rainsplash, surface disturbance by feral pigs and tree throw. The results demonstrate that rainsplash produces the largest amount of soil redistribution each year with disturbance by pigs and tree throw being within the variability of rainsplash soil redistribution. Modelling results demonstrate that the disruption of surface flow by the pig disturbance and tree throw disrupts sedimentological and hydrological connectivity and may have significant influence on soil erosion and landscape evolution.