

Landslide impacts on suspended sediment sources following an extreme event in the Magela Creek catchment, northern Australia

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Abstract Record rainfall of up to 784 mm occurred between 17:00 h 27 February and 17:00 h 2 March 2007 in the Magela Creek catchment, northern Australia. Maximum return periods for 48 and 72 h durations exceeded 1:1000 years. The 24-hour maximum (398.4 mm) is the largest recorded in the region and the 2007 storm exceeded all previous 48 and 72 h recorded rainfall in the Northern Territory but was only one-third of Probable Maximum Precipitation. Sixteen landslides (0.3 km²) were triggered over a small area where sandstone had been stripped to reveal dolerite. The Munsell® soil colour of the <63 µm fraction of suspended sediment showed that in 2008 a series of “red” flood pulses on Magela Creek at stations up- and downstream of Ranger mine were sourced from the landslides by localised storms. Active fluvial sediment sources were restricted to a very small area for short periods of time during specific hydrological events.

Key words sediment colour; suspended sediment sources; sediment fingerprinting; “red” flood pulses