

Characteristics of rain events at an inland locality in northeastern Borneo, Malaysia

Abstract

Understanding the intensity and duration of tropical rain events is critical to modelling the rate and timing of wet-canopy evaporation, the suppression of transpiration, the generation of infiltration-excess overland flow and hence to erosion, and to river responsiveness. Despite this central role, few studies have addressed the characteristics of equatorial rainstorms. This study analyses rainfall data for a 5 km² region largely comprising of the 4 km² Sapat Kalisun Experimental Catchment in the interior of northeastern Borneo at sampling frequencies from 1 min⁻¹ to 1 day⁻¹.

The work clearly shows that most rainfall within this inland, forested area is received during regular short-duration events (<15 min) that have a relatively low intensity (i.e. less than two 0.2 mm rain-gauge tips in almost all 5 min periods). The rainfall appears localized, with significant losses in intergauge correlations being observable in minutes in the case of the typical mid-afternoon, convective events. This suggests that a dense rain-gauge network, sampled at a high temporal frequency, is required for accurate distributed rainfall-runoff modelling of such small catchments. Observed rain-event intensity is much less than the measured infiltration capacities, and thus supports the tenet of the dominance of quick subsurface responses in controlling river behaviour in this small equatorial catchment. Copyright © 2006 John Wiley & Sons, Ltd.