# EROSIVITY AND GEOMORPHIC IMPACTS OF 1991 MT. PINATUBO PYROCLASTIC FLOWS

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The June 1991 eruption of Mt. Pinatubo in the Philippines had produced 5 to 7 cubic kilometers of pyroclastic flows along the flanks of the volcano. There are 8 major watersheds adversely affected by the eruption. The Sacobia-Pasig Catchment will be focus of the study because the geomorphic impacts were significant and the lower catchment poses the greatest lahar threats in terms of lives and properties. The 1991 pyroclastic flows were deposited hot (~500°C), cohesionless and have thickness up to 200 meters in deep pre-eruption valleys. Their inherent physical characteristics are vulnerable to massive mass movement and erosions when subjected to certain rainfall intensities. Telemetered rainfall and flows sensors were installed on the different catchments in order to serve as instrumental warnings for predicting lahar events. These digital data were analyzed in order to determine the rainfall-lahar triggering thresholds. It was figured that out based on the several years of rainfall data the thresholds vary per year and even per rainfall events. These can be attributed to complex factors such as antecedent rainfall, catchment's dynamic morphological changes and piracy, local variations of rainfall and many others. A simple portable rainfall simulator was used in the field to determine the erosivity of the recent deposits. Rainfall-runoff simulations were conducted at different intensities ranging from 2 to 12mm/min. These intensities were employed at different slopes, i.e.. 20, 40, 60, 80 and 100%. Infiltration and runoff were collected in each experiment to assess the relative erosivity at different parameters. It was noted in the simulations that rainfall intensities below 4mm/min do not entrench significant runoff, on the other hand, very high sediment yields were observed on higher intensities. Multi-temporal remote sensing images were also analyzed to give an overview on the rate of geomorphic changes in the catchment and the lahar fan evolution. Yearly erosions were quantitative measured using DTMs in order to assess the sediment decay of the catchment.