

ANÁLISE DOS CONTROLES GEOMORFOLÓGICOS DOS DESLIZAMENTOS NO RIO DE JANEIRO ATRAVÉS DE EVIDÊNCIAS DE CAMPO E DE MODELAGEM MATEMÁTICA EM BASES FÍSICAS

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Landslides are common features in Serra do Mar, located along the southeastern Brazilian coast, most of them triggered by intense summer storms, specially on the soil-mantled steep hillslopes around Rio de Janeiro city, where the "favelas" (slums) proliferated during the last few decades. On February 1996, hundreds of landslides took place in city of Rio de Janeiro during rainstorms with totals above 300 mm in less than two days. Since then, many studies have been carried out in two experimental river basins in order to investigate the role played by the topographic attributes in controlling the spatial distribution of landslides inside these two basins. Landslide scars were mapped based on field observations and on a detailed digital terrain model of the basins (4m² resolution). The main topographic attributes were analyzed and maps for slope, hillslope form, contributing area, hillslope orientation, as well as vegetation cover were generated. By comparing these maps with the spatial distribution of the landslide scars for the 1996 event, a landslide potential index for the many classes of the different topographic attributes was defined. At the same time, field experiments with the Guelph permeameter were carried out and a variety of scenarios were simulated with the SHALSTAB model, a process-based mathematical model for the topographic control on shallow landslides. The results suggest that most of the landslides triggered in the studied basins were strongly influenced by topography, while vegetation cover did affect landslide distribution. Between the topographic attributes, hillslope form and contributing area played a major role in controlling the spatial distribution of landslides. Therefore, any procedure to be used in this environment towards the definition of landslide hazards need to incorporate these topographic attributes.