

Vulnerability of terranes in Rio de Janeiro State, Brazil

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This map was composed on 1:250.000 scale based on the recognition of hydro-erosive processes over the landforms, represented by the relief dissection. The regional geomorphology, the superficial non-consolidated covers and the bedrock (lithology and structures) were considered. The analysis and integration of this information supplied the establishment of terrane vulnerability degrees to erosion processes, mass movements on slopes and floods on lowlands.

This product represents an useful tool to the Rio de Janeiro State macro-planning, in order to manage a sustainable occupation of the territory, in agreement with the economic activities needs and growth, as well as to define the degraded areas that were affected by a disordered occupation. The great escarpments, main ridges and the coastal or the intrusive massifs with high slopes and outcrops, talus deposits or a thin cover of residual soil, underlied by igneous or metamorphic rocks, generally present the highest vulnerability degrees to dissection processes. On the other hand, the extensive fluvial-marine (mangroves) and fluvial-lagoon lowlands, with organic-clay deposits of Quaternary age, generally represent the highest vulnerability degrees to flood risk.

The role played by the structures (joints and faults) is also important to determine the terrane vulnerability degree to dissection processes. Similar regions of the Rio de Janeiro State composed by a hilly topography, covered by sequences of colluvial layers and underlied by gneiss and granitic rocks show different responses to the gully erosion due to the frequency and density of these weakness planes on bedrock, similar to the occurrences on the middle Paraíba do Sul valley.