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DTMs ASSESSMENT TO THE DEFINITION OF SHALLOW LANDSLIDES PRONE AREAS

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Predictive methods have been developed, especially since the 1990s, to identify landslide prone areas. One of the examples it is the physically based model SHALSTAB (Shallow Landsliding Stability Model), that calculate the potential instability for shallow landslides based on topography and physical soil properties. Normally, in such applications in Brazil, the Digital Terrain Model (DTM), is obtained mainly from conventional contour lines. However, recently the LiDAR (Light Detection and Ranging) system has been largely used in Brazil. Thus, this study aimed to evaluate different DTM's, generated from conventional data and LiDAR, and their influence in generating susceptibility maps to shallow landslides using SHALSTAB model. For that were analyzed the physical properties of soil, the response of the model when applying conventional topographical data and LiDAR's in the generation of DTM, and the shallow landslides susceptibility maps based on different topographical data. The selected area is in the urban perimeter of the municipality of Antonina (PR), affected by widespread landslides in March 2011. Among the results, it was evaluated different LiDAR data interpolation, using GIS tools, wherein the Triangulation/Natural Neighbor presented the best performance. It was also found that in one of evaluation indexes (Scars Concentration), the LiDAR derived DTM presented the best performance when compared with the one originated from contour lines, however, the Landslide Potential index, has presented a small increase. Consequently, it was possible to assess the DTM's, and the one derived from LiDAR improved very little the certitude percentage. It is also noted a gap in researches carried out in Brazil on the use of products generated from LiDAR data on geomorphological analysis.