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A landslide susceptibility assessment in urban areas based on existing data: an example from the Iguaná Valley, Medellín City, Colombia

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Abstract. Fast urbanization and the morphological conditions of the Iguaná River Basin, Medellín, Colombia have forced many people to settle on landslide prone slopes as evidenced by extensive landslide induced damage. In this study we used existing disaster databases (inventories) in order to examine the spatial and temporal variability of landsliding in this watershed. The spatial variability of landsliding was examined using "expert-based" and "weighted" landslide susceptibility models. The constructed landslide susceptibility maps demonstrate consistent results irrespective of the underlying method. These show that at least 55% of the watershed is highly or very highly susceptible to landsliding. In addition, the temporal distribution of landsliding was analyzed and compared with climatic data. Results show that the area has a distinct bimodal rainfall distribution, and it is clear that landsliding is particularly frequent during the later rainy season between October and November. Moreover, landslides are more common during La Niña years. It is recommended that the existing landslide inventories are improved and can be of greater use in the future land use planning of the watershed. The construction of landslide susceptibility maps based on existing data represents a significant step towards landslide mitigation in the area. Using susceptibility and hazard assessment during the development process should lessen the need for disaster response at a later stage.

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