THE USE OF UAV DERIVED DEM FOR MAPPING DOLINES IN THE ENVIRONMENTAL PROTECTION AREA OF "NASCENTES DO RIO VERMELHO", GOIÁS, BRAZIL

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Dolines are characteristic landforms of karst environments. They have great morphodynamic importance, concentrating the surface runoff working as points of high dissolution. From an environmental perspective they represent sites of high intrinsic vulnerability, playing a major role in the transmission of hydrological inputs and trophic resources for the underground sectors, along with the epikarst. This study aims to identify the dolines and other surface features through aid of digital elevation models (DEM) and three-dimensional photomosaics in an extensive karst protected area in the Rio Vermelho headwaters region (176.000 ha), northeast of the state of Goiás, Brazil. This project tested the use of DEM constructed from UAV (<1m) photomosaic and DEM from ALOS-PALSAR (12.5 m), for a small testing area (51.5 ha), using analytic approaches to detect dolines through closed contours. It was observed that from 19 small and medium dolines identified in field, UAV highlighted 17, representing 89.5% accuracy. However, the large number of spurious features observed (128) besides two false negatives indicate the need for adjustments and the adoption of morphometric filters to eliminate small-scale artifacts. Otherwise the ALOS-PALSAR highlighted 11 features (57.9%), ignoring small dolines, indicating it is more usefful for analyzes in larger areas. In general it was observed that will be needed filtering, visual checks through photointerpretation and field validation to obtain results that correctly represent the local karst features.

Keywords: Doline; DEM; UAV