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Relief mapping to best management practices placement purpose: an evaluation of different Digital Elevation Models

Fábio Luiz Macao Campos[1,2] and André Luiz Nascentes Coelho[2]
[1]Ifes, Campus Vitória, Geoprocessamento, Brazil (fabiomacao@gmail.com)
[2]Universidade Federal do Espírito Santo, Departamento de Geogragfia, Brazil

Geomorphometry is an interdisciplinary science that aims to quantify the earth's surface landforms. This science techniques have supported the development of several knowledge fields, including geomorphology, in which the relationship between landforms and processes can be better understood and used in practical applications. In order to evaluate the use of geomorphometric techniques for structural best management practices (BMPs) placement in basin scale and what spatial resolution can provide better results, a morphological mapping methodology has been developed and 3 different digital elevation models (DEM) have been evaluated as data sources (SRTM – 30 m; ALOS/PALSAR – 12.5 m; GEOBASES – 2 m). The methodology has been applied in a small watershed in Espírito Santo state (Brazil) using 3 DEMs with different spatial resolutions. In such basin, slope segments previously defined as priorities for the BMP placement has been mapped using the Qgis software and the SAGA tools, for the 3 DEMs. The landforms mapped have been compared to the landforms observed in a field work. The results show the differences between the DEMs related to the mapping of relief units (summit, slope, valley) as well as the curvature of the slope segments (concave, straight, convex). Different results in terms of mapping priority areas for BMP placement have been noticed. The SRTM and Alos/Palsar DEMs are proven to be great options for carrying out morphological mapping for BMP placement purpose. Both DEMs have produced very similar results compared to the field work, while the 2-meters spatial resolution DEM was not able to map the features satisfactorily due misrepresentation of landforms and slope segments.