Inverse distance weighting interpolated soil properties and their related landslide occurrences

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Abstract	The causes of landslides can be categorized into three factors: climate, topographic, and soil properties. In many cases, thematic maps of landslide hazards do not involve slope stability analyses to predict the region of potential landslide risks. Slope stability calculation is required to determine the safety factor of a slope. The calculation of slope stability requires the soil properties, such as soil cohesion, the internal friction angle and the depth of hard-rock. The soil properties obtained from the field and laboratory investigation from the western part of Central Java were interpolated using Inverse Distance Weighting (IDW) to estimate the unknown soil properties in the gridded area. In this research, the IDW optimum parameter was determined by validation toward the percent bias. It was found that the IDW interpolation using higher weighting factor corresponds with a higher percent bias in case of the depth of hard-rock and soil cohesion, while the opposite was found for the internal friction angle. Validation to landslide incidents in western parts of Central Java shows that the majority of landslide incidents occur at depths of hard rock of 6 m-8 m, at soil cohesions of 0.0 kg/cm(2)-0.2 kg/cm(2), and at internal friction angles of 30 degrees-40 degrees.
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