



## Evaluation of landslide conditioning factors and the probability of occurrence in an Andean context: Case of Province of Azuay (Ecuador)

**Victor Rodriguez-Galiano**<sup>1</sup>, Sandra Cobos-Mora<sup>1,2</sup>, and Aracely Lima<sup>3,4</sup>

<sup>1</sup>Universidad de Sevilla, Physical Geography, Seville, Spain

<sup>2</sup>Research, Innovation and Technology Transfer Center (CIITT), Universidad Católica de Cuenca, Cuenca, Ecuador

<sup>3</sup>Universidad Politécnica de Madrid, Madrid, España

<sup>4</sup>Instituto de Investigación Geológico y Energético, Quito, Ecuador.

Across the globe, landslides are among the natural phenomena that can have significant adverse impacts on landscape changes, natural resources, and human health. This phenomenon is even more severe in the Andean region, given its geomorphological conditions, urbanization processes, poverty and inequality. The occurrence of landslides is an important triggering for changes in the vegetation cover. Therefore, this research aims to identify the most significant landslides conditioning factors within the Andean zone on a regional scale and the propose of its consequent data-driven susceptibility model. Geomatics techniques were used to describe the physical, environmental, climatology, and anthropic characteristics of 665 landslides event recorded in the province of Azuay in Ecuador. The statistical methods used were exploratory factor analysis and logistic regression. Both analyses have been consistent in their importance of Normalized Difference Vegetation Index, Normalized Difference Water Index, altitude, fault density and Principal Component number 2. The latter represents precipitation in statistics such as standard deviation, maximum values and precipitation in the months of January, February and March. The optimized susceptibility model (AIC= 964.63, deviation of residuals 924.63, AUC = 0.92, accuracy = 0.84, Kappa = 0.68) also shows statistical significance for the factors of the slope, faults distance and density, roads density, geology and soil cover.