Integrating methods for investigating a historic landslide: Jagüeyes landslide case study, Cuba

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Integration of geophysics, digital photogrammetry, geomorphology, geological mapping and dynamic modeling was made in order to investigate an historic landslide in Guantánamo province, Cuba. The landslide Jagüeyes happened in 1963 during Hurricane Flora causing casualties and economic losses. Neither technical report nor historical record by the authorities was made afterwards. By integrating different methods the occurrence of the event was reconstructed. The rainfall conditions during this hurricane at the landslide location were created by information from the literature. Detailed geomorphological mapping with aerial photos before and after the event made possible to characterize the area. Electrical and seismic methods allowed better differentiation of underground layers. The digital photogrammetric techniques were utilized to create both, before and after, digital elevation models (DEM) with 2 meter

resolution. With these DEMs, by analyzing elevation profiles, the sliding surface was generated and the movement was simulated with the appropriated geotechnical parameters with dynamic modeling. The integration of these methods leads to improve the understanding of the conditions under which this landslide took place and analyze the triggering mechanisms. With the parameter estimates obtained from this case study, similar locations can be simulated in the areas nearby.