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Satellite-based Algorithm for Landslide Hazard Risk Assessment: A Global and Regional Approach

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A global, satellite-based landslide algorithm has been developed using surface information and multi-satellite rainfall data. The technique integrates surface parameters with satellite precipitation data to obtain an estimate of areas susceptible to landslides in near-real time. The outputs to this algorithm are compared with a global landslide event inventory to assess both the relative skill of the technique and the value of currently available landslide information on a global scale. Results indicate that the general pattern of landslide activity (number of total events, geographic distribution, etc.) can be reproduced, but finer-scale distributions and individual events are difficult to match between the forecast and the event inventory.

To better comprehend the algorithm's capabilities for landslide hazard risk assessment the study also addresses the algorithm capabilities on the regional scale, focusing on Central America and the Caribbean. The study draws on available landslide data and higher resolution surface information to evaluate physical landslide risk in this region, comparing the results to the global susceptibility map and other regional studies. Socioeconomic risk can also be derived using population data and road networks to determine social vulnerability to landslide hazards.

The downscaling of the global landslide algorithm provides the foundation to improve the susceptibility inputs and rainfall relationship for other regions around the world. With adjustment, the algorithm shows great promise in approaching landslide

hazard assessment globally and providing information for the research community to address landslide issues in a broader context. The evaluation also provides insight into the necessary considerations and potential adaptations to the algorithm for improved landslide hazard forecasting on a global scale and the need for international efforts for developing accurate landslide inventories.