Abstract Details

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Title: The Initiation Erosion Criterion of Debris Flows

Abstract:

Rainfall-induced debris flows are not uncommon in Hong Kong. For e[...] a series of debris flows occurred on 14 April 2000 at the mountain ra[...] west of Tuen Mun. During these events, boulders and soils reached Tu[...] Golf Centre and Leung King Estate. The most uncertain aspect in deb[...] is probably the mechanism of erosion and deposition. Thus, this stud[...] proposes an initiation criterion on the onset of erosion mechanism. Th[...] proposed initiation erosion criterion is derived based on the concept [...] transport limit which is the maximum eroded solid content that can b[...] carried and sustained in the debris mixture. This transport limit is giv[...] Marshall et al. (1996) based on the concept that a fraction of stream [...] is dissipated in the erosion process. The proposed criterion is then incorporated with the theoretical model of Takahashi et al. (1992). Th[...] prediction of runout distance is improved. The resulting numerical simulations of debris flows are used in identifying hazardous areas pr[...] debris flow occurrence. More specifically, the Digital Elevation Model ([...] the terrain Leung King Estate and of the potential debris-flow sources generated by using GIS to provide the required data for simulations. [...] well-documented 1990 Tsing Shan debris flow, which occurred not to[...] from Leung King Estate, was used to calibrate most of the flow param[...] needed for computer simulations. Based on the simulation results, a potential hazard zone is identified and presented by using GIS. The deposition and erosion mechanisms are found extremely important in[...] predicting the runout distance as well as the debris coverage area. References: [1] T. Takahashi, H. Nakagawa, T. Harada, and Y. Yamash[...] Journal of Hydraulic Engineering, 118(11), 1490-1507 (1992). [2] T. [...] Marshall, J. W. Holmes and C. W. Rose, Soil Physics, 3rd ed., Cambrid[...] University Press, New York (1996). Acknowledgement: The work desc[...] here is supported by Research Grants Council of the Hong Kong Speci[...] Administrative Region, China (Project Nos. A-PE79 and A226).

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