The Susceptibility Index to Failure (SIF) and the Source Affecting Index to characterize rockfall release areas

Maria Lia Napoli, Monica Barbero, Francesco Castelli, Marta Castelli, Valentina Lentini

Summary

This work proposes a semi-quantitative practical methodology to produce “weighted” rockfall susceptibility/hazard maps, for different environments and scales of interest, according to the propensity of the unstable rock blocks to de-tach. To this aim, a rockfall Susceptibility Index to Failure (SIF) is assigned to the detachment areas, which is defined on the basis of the presence and intensity of the major predisposing, preparatory and triggering factors. A novel approach is also proposed to determine a source affecting index of the rockfall source areas, with reference to specific elements at risk, that can be useful in the framework of risk management and mitigation activities, for exam-ple to optimize the positioning of risk monitoring instruments on the rock wall or stabilization systems. The proposed methods are exemplified in the paper through their application to a case study in the northern coast of Sicily, Italy.

Keywords: rockfalls, causative factors, Susceptibility Index to Failure (SIF), rockfall source affecting index