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High detailed debris flows hazard maps by a cellular automata approach

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The individuation of areas that are more likely to be interested by new debris flows in regions that are particularly exposed to such kind of phenomena is of fundamental relevance for mitigating possible consequences, both in terms of loss of human lives and material properties.
Here we show the adaption of a recent methodology, already successfully applied to lava flows, for defining flexible high-detailed and reliable hazard maps. The methodology relies on both an adequate knowledge of the study area, assessed by an accurate analysis of its past behavior, together with a reliable numerical model for simulating debris flows on present topographic data (the Cellular Automata model SCIDDICA, in the present case). Furthermore, High Performance Parallel Computing is employed for increasing computational efficiency, due to the great number of simulations of hypothetical events that are required for characterizing the susceptibility to flow invasion of the study area.
The application of the presented methodology to the case of Gragnano (Italy) pointed out the goodness of the proposed approach, suggesting its appropriateness for land use planning and Civil Defense applications.