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Hydro-geomechanical and hydraulic methods for the analysis of the 1997 Cabrera River debris flood in the Spanish Central System

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The combined use of hydro-geotechnical and hydraulic models is a suitable method to simulate debris floods. To this end, a meteorological (rain gauges) and hydrological (water level logger) monitoring was established in a torrential watershed, where took place an important debris flood event in 1997. The information provided for this gauges, along with the implementation of a natural slope stability model, have made the evaluation of the triggering rainfall possible. Likewise, with this data the hydrological response of the watershed, as a result of the abovementioned event, was estimated by developing a precipitation-runoff model in HEC-HMS. On the other hand, the critical-depth method was applied in order to determine the peak discharge of the debris flood. Finally, the transport sediment load was defined by subtracting the peak discharges obtained after the critical-depth method and the precipitation-runoff model were developed.