



The importance of rheology in the debris flow behaviour in order to model the phenomena through the Flo-2D simulation software.

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On 29th August 2003 the North Eastern part of Friuli Venezia Giulia Region was invested by an intense alluvial event. Those particularly harsh weather conditions caused more than hundred debris flow phenomena that involved the infrastructures present in the area. In this paper we analyze one single debris flow (here called Fella sx) developed on a small river located in left hydrographic of Fella River and interesting the A23 Highway with its alluvial debris.

To examine the behaviour of debris flow, a back analysis study was firstly carried out with the commercial Flo-2D software so allowing to assess the rheological parameters (yield stress and viscosity) that better characterize the phenomena. Such parameters were chosen from a list of parameters available in literature.

Samples were collected from the sediment source area along the flow path, sieve analyses were performed and rheological tests were carried out on the fraction finer than 0,063 mm using a rotational controlled stress rheometer (Haake RS150) equipped with the serrated parallel plate geometry (gap 1 mm).

The shear-dependent behaviour was examined at different concentration ranging from 33 to 48%, by weight. Viscosity data treatment was performed in order to individuate the rheological model suitable to provide the best approximation to the debris flow behaviour. The rheological parameters derived from experimental data correlation were used to implement the Flo-2D software and the results were compared with those obtained through the back analysis simulation method.