



Hydrological and hydrometeorological analysis of the 2003 Val Canale flash flood in north-eastern Italy

(1) **M. Borga**, (1) F. Zanon, (1) P. Boscolo

(1) Department of Land and Agroforest Environments, University of Padova, Legnaro, IT-35020, marco.borga@unipd.it

On the 29 August 2003, an extreme storm developed over the Fella catchment (Val Canale), in the Upper Tagliamento river basin. The region received amounts of rainfall up to 400 mm in 6 hours, with return times higher than 500 years. This extreme rainfall event triggered one of the century's most significant floods in the Tagliamento river basin and produced remarkable flash floods, landsliding and debris flows in some of its tributaries. The event resulted in 2 casualties and an economic damage around 1 billion Euro.

Radar and rain gauge observations are used to assess the magnitude, the organization and the dynamics of the rain event. The Val Canale Storm represents a setting in which several intense convective cells pass in succession over the same spot ("train effect"). The storm total rainfall distribution reflects north-east motion of the storm elements. Tracks of the convective cells cover the same area, producing a narrow swath of heavy rainfall oriented from south-west to north-east.

A post-event survey was organised to gather data on peak flows and landsliding occurrences. The consistency of this data with the radar rainfall estimates was analysed using a distributed hydrological model. The preliminary results of the analysis show that i) the hydrologic response of the upstream watersheds (with sizes in the range of 50-400 km²) of the Fella tributaries is consistent with the marked space-time structure of the rain event; ii) the hydrological response is strongly affected by non-linear effects due to the dynamic extension of the river network during the event.