



Runoff generation and sensitivity to antecedent soil moisture conditions for a major flash flood event.

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Among natural hazards, flash floods belong to the most devastating in terms of losses of life and property. Understanding the generation and controls of such extreme hydrologic phenomena is necessary to improve our prediction ability and develop more accurate warning systems. In this study, a major flood event during August 29, 2003 on the upper Tagliamento river basin (eastern Italian Alps) is examined and a distributed hydrologic model is used to investigate the dominant runoff generation mechanisms. The basin, with an area of approximately 623 km² is divided into several sub-basins that range in size between 24-330 km², to investigate the scale dependence of flood response. The effect of initial soil moisture conditions to i) runoff generation, ii) runoff mechanism and iii) the scaling relationship of peak flows, is examined through a simulation based experiment. The modeling results from this hydrologic analysis provide valuable insight regarding the initiation and evolution of the flooding thus enhancing our knowledge related to controlling factors of extreme events.