



Reconstruction of the 8-9 September 2002 catastrophic flood event in the Gard region, France: Radar rainfall estimation, hydrologic and hydraulic modelling

G. Delrieu, L. Bonnifait, and B. Boudevillain

Laboratoire d'étude des Transferts en Hydrologie et Environnement, Grenoble, France

On 8-9 September 2002, an extreme rainfall event due to a mesoscale convective system (MCS) occurred in the Gard region, France, resulting in 24 casualties and severe economic damage. This presentation is aimed at describing the radar rainfall estimation procedure and the distributed hydrologic and hydraulic modelling exercise that was conducted to put in coherence the various sources of data collected operationally and during the post-event field surveys.

The convective part of the MCS and its trajectory explains the flash floods over the head watersheds (200-300 mm in 6 hours for drainage areas of less than 100 km²). The stationarity of the MCS during 24 hours explains the extraordinary magnitude of the flood for the bigger watersheds (400-500 mm in 24 hours for watersheds of 1000–2000 km²). This finding supports the concept of “scale resonance” between atmospheric and geomorphic patterns and the first order control of the space-time variability of rainfall. The impact of other factors related to the geomorphology, the geology and the initial moisture state will be illustrated as well.