Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11629, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11629
EGU General Assembly 2008

The benefit of high-resolution operational weather forecasts for flash-flood warning in Mediterranean areas.

J. Younis (1), S. Anquetin (2), J. Thielen (1)

(1) Institute for Environment and Sustainability, European Commission Joint Research Centre, Ispra, Italy, (2) LTHE, Université de Grenoble (CNRS, UJF, IRD, INPG), France (jalal.younis@jrc.it / Fax: +390332786653 / Phone: +390332785455)

In Mediterranean Europe, flash flooding is one of the most devastating hazards in terms of human life loss and infrastructures. Over the last two decades, flash floods brought losses of a billion Euros of damage in France alone. One of the problems of flash floods is that warning times are very short, leaving typically only a few hours for civil protection services to act. This study investigates if operationally available short range numerical weather forecasts together with a rainfall-runoff model can be used as early indication for the occurrence of flash floods. One of the challenges in flash flood forecasting is that the watersheds are typically small and good observational networks of both rainfall and discharge are rare. Therefore, hydrological models are difficult to calibrate and the simulated river discharges cannot always be compared with ground "truth". The lack of observations in most flash flood prone basins, therefore, lead to develop a method where the excess of the simulated discharge above a critical threshold can provide the forecaster with an indication of potential flood hazard in the area with leadtimes of the order of the weather forecasts.

This study is focused on the Cévennes-Vivarais region in the Southeast of the Massif Central in France and in the Northern East part of Italy, regions known for devastating flash floods. The September 2002, in the France, and the August 2003, in Italy, storms are used as case study for both regions. The critical aspects of using numerical weather forecasting for flash flood forecasting are being described together with a threshold -

exceedance. The short-range weather forecasts, from the Lokalmodell of the German national weather service, are driving the LISFLOOD model, a hybrid between conceptual and physically based rainfall-runoff model. Results of the study indicate that high resolution operational weather forecasting combined with a rainfall-runoff model could be useful to determine flash floods more than 24 hours in advance.