



Post flash flood field investigations and analysis: the event on 22 November 2011 in Longano catchment, Italy

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On 22 November 2011, an exceptional rainstorm hit the North-East part of Sicily (Italy) producing local heavy rainfall, mud-debris flow and flash flooding. The storm was concentrated on the Tyrrhenian Sea coast near the city of Barcellona within the Longano catchment. The estimated flood peak discharge of the Longano river in the city of Barcellona (about 230 m³/s for 26 km²) is close to the highest values reported in Europe for similar watershed areas.

Rainfall data from raingauge and meteorological radar were analysed and a detailed study of the hydrological response of the catchment was performed by means of rainfall-runoff modelling and flood frequency analysis. The results of the rainfall-runoff model were compared with peak discharges estimated from field observations (cross-sections survey, water marks, witnesses interviews and video recordings). Flood inundation and propagation in the city were modelled using an hydraulic model based on De Saint Venant equation equations calibrated using the data collected (water depths and flow velocities). A geomorphological survey was also conducted to ascertain the evolution of the phenomenon and related sediment processes analysis.