Geophysical Research Abstracts
Vol. 14, EGU2012-12744, 2012
EGU General Assembly 2012

On the use of innovative post-event data for reducing uncertainty in calibrating flood propagation models

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Hydraulic models for flood propagation description are an essential tool in many fields and are used, for example, for flood hazard and risk assessments, evaluation of flood control measures, etc. However, the calibration of these models is still underdeveloped in contrast to other models like e.g. hydrological models essentially for lacking of specific data, because extreme flood events occur rarely and very rarely are monitored. Very often calibration data, when available, consist of water depths measure in some scattered points.
For an inundation event occurred on November 2011 in Sicily, new sources of data were available due to the availability of many videos recorded by 'normal' people using new technologies. These videos allowed to derive flow velocities and estimate flow discharges in some parts of the inundated area. These pieces of information have been used together with the measured water depths to improve GLUE calibration of a two-dimensional finite element flood propagation model and reduce equifinality in its predictions.