Calibration of inundation models using uncertain SAR-derived maps of flood extent

Giuliano Di Baldassarre (1), Guy Schumann (2), and Paul Bates (2)

(1) UNESCO-IHE Delft, Hydroinformatics and Knowledge Management, Delft, Netherlands
(g.dibaldassarre@unesco-ihe.org), (2) University of Bristol, School of Geographical Sciences, UK

This presentation deals with the calibration of hydraulic models using uncertain inundation maps derived from SAR imagery. The study was performed on a river reach of the Lower Dee, UK, where coarse (ENVISAT ASAR) and high (ERS-2 SAR) resolution imagery were acquired at the same time during the December 2006 flood event. Ten different flood extent maps were derived from the two flood imagery by using five different image processing techniques. These flood extent maps were used to perform a sensitivity analysis of a simple raster-based inundation model (LISFLOOD-FP). Thus, the capability of the two images to calibrate the friction parameters of the model was investigated. The analysis showed that the optimal parameters of the model depend on the type of satellite image used to evaluate the model as well as on the particular procedure used to derive the flood extent map. Then, a methodology is developed to calibrate flood inundation models by comparing the model results to uncertain inundation maps, which are obtained by combining the ten different flood extent maps.