Evaluation of finite volume and finite element models for predicting flood inundation

M.S. Horritt (1), **G. Di Baldassarre** (2), P.D. Bates (3) and A. Brath (2)

(1) Department of Civil Engineering, University of Bristol (2) Faculty of Engineering, University of Bologna (3) School of Geographical Sciences, University of Bristol

Finite volume (SFV) and finite element (TELEMAC-2D) inundation models are tested on a 16km reach of the River Severn, UK. Predicted inundation extents are compared with 4 airborne synthetic aperture radar (SAR) images of a flood event in November 2000 corresponding to different discharge values. The two models, using floodplain and channel roughness coefficient as parameters, are independently calibrated and validated against the observed inundated area. The images points out a different aptitude to constrain friction parameters. In particular, the image acquired at low flow rate do better in determining these parameters than the image acquired at approximately peak flow. The models produce similar optimum measures of performance, with a capability that decreases as flow increases. TELEMAC-2D shows less sensitivity to roughness coefficient and more sensitivity to mesh resolution than SFV. Finally, the study points out that, when the models are used in predictive mode, calibrated against one image and validated against another, SFV performs better than TELEMAC-2D.