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Mapping floodplain inundation risk in Europe

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This paper explores scale issues in relation to flood risk mapping, illustrated with examples from the UK, France, Hungary and the Czech Republic. In each case JBA's 2-D floodplain inundation model, JFLOW-GPU (Lamb et al, 2008; Lamb et al, in press), has been used to determine the depth and extent of flooding over the study area for a given probability.

The processing speed that can be achieved using JFLOW-GPU has allowed the consistent application of very detailed inundation mapping at national scale. Uniquely this has allowed us to evaluate the impact for large scale flood mapping of two important factors; the resolution of the mapping (generally a function of the underlying DTM) and the scale of the floodplain system.

For the extensive floodplains of Europe's major basins, such as the Danube, a relatively coarse DTM might be expected to give adequate results. However as these floodplains are very flat the model can move flood waters laterally resulting in extensive but shallow flooding: a careful balance therefore has to be achieved between DTM resolution and roughness to ensure derived flood extents are realistic. For smaller steeper watercourses where floodplain conveyance is generally confined in a direction parallel to the channel, the maximum depth of flooding is of most use for hazard mapping necessitating a high resolution DTM.