

## **Assessing the usefulness of SRTM topography to support hydraulic modelling under uncertainty**

The consequences of recent catastrophic events have highlighted that flood risk prevention still needs to be improved to reduce human losses and economic damages. The desirable topography data based on ground surveys for model building and calibration to support the decision making process in flood risk management are often not sufficient or unavailable. Accurate remote sensing data coming from the Light Detection and Ranging (LiDAR) is expensive and often cannot be directly used. In this connection testing the usefulness of freely and globally available data, such as the Shuttle Radar Topography Mission (SRTM) in supporting hydraulic modelling of floods is of extremely high interest from both a scientific and engineering point of view. However, it is not clear to what extent exactly modellers can trust or make use of these topographic data, particularly under major source of uncertainties which unavoidably affect the hydraulic modelling of floods. Therefore, two studies were carried out to explore the usefulness of SRTM topography: River Po in Italy and River Dee in UK which are characterized by different scales. The comparison between a hydraulic model based on high quality topography and one based on SRTM topography was carried out for each case study by explicitly considering other sources of uncertainty (besides topography inaccuracy), such as parameter and observation uncertainties. The results of this study shows that the differences between the high resolution topography-based model and SRTM-based model are significant, but still within the accuracy that is typically associated in flood studies. Lastly, the limitations of using global topography data for supporting floodplain mapping in medium-small rivers are highlighted.