Investigating the suitability of new global elevation data sets for flood inundation modelling

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Short summary

The risk of flooding is expected to increase over the next century due to a combination of climate change, sea level rise and an increase in the urban population on floodplains. Much of this increase in risk will occur in developing economies where access to detailed flood hazard data is limited. In such data poor areas, the Shuttle Radar Topography Mission (SRTM) DEM has become an indispensable dataset for hydrodynamic modelling of important river floodplains as there are few alternatives. Many of these studies show that the SRTM data may be close to, but not quite good enough to represent the floodplain features that are important for many rivers.

The new Tandem-X and updated SRTM global DEM’s may provide better data for hydrodynamic modelling purposes, however the suitability of these DEM’s for flood inundation simulation has yet to be investigated. We aim to carry out a detailed comparison of the relative difference that a range of DEMs have on a modelled river system. This study will assess if the new more detailed DEM’s have the potential to represent many of the connectivity processes that are currently omitted from global DEM’s, thus improving hydrodynamic modelling globally.

Added value

Training will be provided in flood inundation modelling with the LISFLOOD-FP model (http://www.bris.ac.uk/geography/research/hydrology/models/lisflood/). The student will gain experience with the latest global DEM products including Tandem-X data via DLR project IDEM_HYDR0044

The School of Geographical Sciences, Bristol is an RAE 6* Department with a formal Graduate School and excellent facilities for research including high performance computing, software and library support essential to the success of such a project.

Fig. 1: Flood hazard in Cambodia using global SRTM DEM data and LISFLOOD-FP