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Digital Terrain Model's resolution influence on flood scenario design

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The increasing spatial resolution of Digital Terrain Models (DTMs) derived from Airborne Laser Scanning (ALS) instruments offer high-quality landscape descriptions. In some cases, the resolution is such that direct modelling of the coupled hydraulic processes of flood wave propagation in drainage channels and inundation of the floodplains can be afforded.
In this work, a high-resolution ALS DTM is used to investigate the influence of the spatial DTM resolution on the main aspects of the flooding process. Hydrologic and damage data, recorded for the 2006 flood event in the Aspio drainage basin (Marche, Italy), are first used for model calibration and validation. DTM scale influence on the description of the flooding process is then analysed by artificially decreasing its resolution. Results are compared in term of flood scenarios, i.e. inundation extension and flow depth and velocity in flooded areas. Finally, their reliability will be discussed with emphasis on the management of flood prone areas, land use restrictions, insurance and environmental aspects.