Floodplain mapping via 1D and quasi-2D numerical models in the valley of Thessaly, Greece

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The European Union Floods Directive defines a flood as 'a covering by water of land not normally covered by water'. Human activities, such as agriculture, urban development, industry and tourism, contribute to an increase in the likelihood and adverse impacts of flood events. The study of the hydraulic behaviour of a river is important in flood risk management. Here, we investigate the behaviour of three hydraulic models, with different theoretical frameworks, in a real case scenario. The area is located in the Penios river basin, in the plain of Thessaly (Greece). The three models used are the one-dimensional HEC-RAS and the quasi two-dimensional LISFLOOD-FP and FLO-2D which are compared to each other, in terms of simulated maximum water depth as well as maximum flow velocity, and to a real flood event. Moreover, a sensitivity analysis is performed to determine how each simulation is affected by the river and floodplain roughness coefficient, in terms of flood inundation.