



## **Novel flood risk assessment framework for rapid decision making**

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The impacts of catastrophic flooding, have significantly increased over the last few decades. This is due to primarily the increased urbanisation in ever-expanding mega-cities as well as due to the intensification both in magnitude and frequency of extreme hydrologic events.

Herein a novel conceptual framework is presented that incorporates the use of real-time information to inform and update low dimensionality hydraulic models, to allow for rapid decision making towards preventing loss of life and safeguarding critical infrastructure.

In particular, a case study from the recent UK floods in the area of Whitesands (Dumfries), is presented to demonstrate the utility of this approach. It is demonstrated that effectively combining a wealth of readily available qualitative information (such as crowdsourced visual documentation or using live data from sensing techniques), with existing quantitative data, can help appropriately update hydraulic models and reduce modelling uncertainties in future flood risk assessments. This approach is even more useful in cases where hydraulic models are limited, do not exist or were not needed before unpredicted dynamic modifications to the river system took place (for example in the case of reduced or eliminated hydraulic capacity due to blockages). The low computational cost and rapid assessment this framework offers, render it promising for innovating in flood management.