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Exploiting diverse crowd-sourced data as part of a mixed-methods approach to validating modelled flood extents and dynamics

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The use of flood models for evaluating flood risk from rivers and the sea is now a standard practice across Europe since the introduction of the 2007 EU Floods Directive requiring the assessment and mapping of flood risk from all major rivers and the sea. The availability of high quality topographic data from LiDAR and other remotely sensed sources has led to the increasing adoption of 2 dimensional models for simulating the dynamics of flooding on the floodplain. However, the ability to effectively validate dynamic floodplain inundation has not kept pace with the increasing complexity and spatial resolution of flood models. Validation remains dependent upon in-channel validation using flood level gauges or post-event data collection of wrack-marks, sometimes supplemented by community-derived anecdotal data.

This poster presents the findings of a 'mixed-methods approach' to flood model validation using the winter 2016 floods on the River Tyne, UK. Using flood inundation results from a simple LISFLOOD-FP model of the River Tyne at Corbridge, the research develops a novel mixed-methods approach to validating both the maximum flood depths and extents, and the dynamics of the flood through the event. A crowd-sourced dataset of anecdotal information on flood dynamics, supported by photographic and video evidence, as well as community-derived, high definition UAV footage captured 24 and 48 hours after the peak of the event, allows for the comprehensive reconstruction of the flood dynamics and a more complete validation of the effectiveness of the model in reconstructing not just the maximum flood extent but also the dynamics of the rising and falling stages of an event.

The findings of the research indicate the potential for making use of a much greater variety of locally-sourced data, particularly exploiting new technologies which offer opportunities for the collection of high quality data in the immediate aftermath of flooding events when traditional agencies may still be engaged in event recovery.