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A participatory modelling approach to developing a numerical sediment dynamics model

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Fluvial geomorphology is recognised as an important consideration in policy and legislation in the management of river catchments. Despite this recognition, limited knowledge exchange occurs between scientific researchers and river management practitioners. An example of this can be found within the limited uptake of numerical models of sediment dynamics by river management practitioners in the United Kingdom. The uptake of these models amongst the applied community is important as they have the potential to articulate how, at the catchment-scale, the impacts of management strategies of land-use change affect sediment dynamics and resulting channel quality.

This paper describes and evaluates a new approach which involves river management stakeholders in an iterative and reflexive participatory modelling process. The aim of this approach was to create an environment for knowledge exchange between the stakeholders and the research team in the process of co-constructing a model. This process adopted a multiple case study approach, involving four groups of river catchment stakeholders in the United Kingdom. These stakeholder groups were involved in several stages of the participatory modelling process including: requirements analysis, model design, model development, and model evaluation. Stakeholders have provided input into a number of aspects of the modelling process, such as: data requirements, user interface, modelled processes, model assumptions, model applications, and model outputs. This paper will reflect on this process, in particular: the innovative methods used, data generated, and lessons learnt.