



## **Simulating the impact of long-term environmental change on catchment sediment dynamics and floodplain evolution**

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Recent advances in landscape evolution modelling now permit the use of numerical models to investigate the impact of environmental change on catchment sediment dynamics and floodplain evolution. This study uses the caesar landscape evolution model, which applies a cellular automaton approach to simulate hillslope, fluvial, and alluvial processes. The model can simulate geomorphological change on both catchment and reach scales. Catchment scale modelling determines sediment inputs for the reach scale modelling. The latter then provides high-resolution simulations of the alluvial adjustment to the sediment dynamics. In this study a natural river reach was chosen along the Upper River Severn, Wales, UK. Four hypothetical environmental scenarios, each covering a period of 2000 years, are simulated to investigate the impacts of variations in climate (precipitation regime) and land use (vegetation cover) on catchment sediment delivery and on subsequent channel pattern and floodplain geomorphology.