



## **Understanding the transport and fate of multiple pollutants: development and testing of a coupled surface-groundwater flow and water quality model**

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The problem of river pollutant diversity, especially in the south-east of UK, is typically associated with sediment, nutrients and micro-organic chemicals such as pesticides. The pollution problem is further exacerbated by climate change and population growth. Given this policy makers and environmental regulators need catchment scale water quantity and quality model that could be potentially used to assess multiple pollutants in catchments with a large groundwater contribution.

The research presented here details development of a spatially explicit, coupled surface- groundwater model and its application in an exemplar lowland catchment in the south-east of UK with extensive surface and groundwater datasets available. More specifically, the fully distributed mesoscale hydrological model (mHM) is coupled with MODFLOW in the Enborne catchment (150 km<sup>2</sup>). Simulations are conducted on daily time step with spatial resolution of 1 km<sup>2</sup> grid cell between 1970 and 2010. The spatially explicit nature of the modelling framework is being used to explore aquifer recharge and water and solute residence times to ultimately explore the lags between changes to pollutant loadings, the introduction of small-scale pollution control measures and the within stream response.