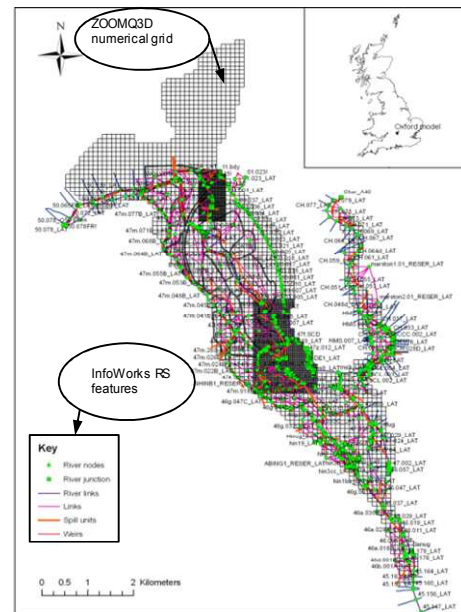


Integrated modelling of surface water-groundwater for flood simulation in the Oxford floodplain

The city of Oxford is located in the upper reaches of the River Thames catchment, in the south of England. Within Oxford there are several urban areas that are located on the floodplain and which are inundated during major flood events, characterised by a combination of rising groundwater and fluvial flood waters. Analysis of recorded river stage and groundwater levels in the underlying gravel aquifer in the flood event in 2007 indicates that flood waters spilled over from the river into the floodplain causing widespread surface water flooding but that flood recession in the floodplain is mainly governed by interaction between the gravel aquifer and the River Thames and its tributaries. A study has been initiated to explore the benefits of using OpenMI technology for linking the surface water and groundwater models of the Oxford floodplain. The main objectives are to improve the representation of flow processes in the models in an attempt to improve the simulation of flood events.



The composition consists of an advanced 1-D fully hydrodynamic river model coupled with a 2-D physically based groundwater model. The model replicates water levels during the floods of summer 2007 but initial model runs indicate that the representation of floodplains needs improvement to allow the use of the model for managing flood levels. The research has also shown that using OpenMI technology may require modifications to existing model setups prior to model integration. However, it successfully demonstrates the linking of two structurally different models to enhance the modelling of flow processes. This research is ongoing.

Keywords

Flood, Urban, Surface water, Groundwater, Integrated, OpenMI, Floodplain, Oxford.

For More Information

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<http://www.openmi.org>