Flood Modeller Pro

Integrated 1D-2D canal modelling of the Grand Union Canal, England

CH2M was commissioned by England's Environment Agency in 2015 to investigate the interaction between the Grand Union Canal and the river Ouzel during high flow events at Leighton Buzzard, Bedfordshire (England), as local residents and the Regional Flood and Coastal Committee expressed concerns over potential flood risk following overtopping of the canal into the Ouzel.

The project involved the development of a 1D-2D model for the Grand Union Canal and connecting it to an existing hydraulic model of the river Ouzel at Leighton Buzzard. The existing ESTRY-TUFLOW (1D-2D) model included the river Ouzel and tributaries, and allowed for storage from the Grand Union Canal in the floodplain, but no attempt had been made to model the canal as a flooding mechanism.

A review of the model and hydrology was initially carried out to check that the existing files were suitable for the investigation. Following the audit, the model hydrology was re-schematized to meet the needs of the project.

This involved producing flows for heavily urbanized sub-catchments, which could be easily be obtained using the urban subdivision option for ReFH units within Flood Modeller Pro. The urban subdivision option is already available within the ReFH unit and requires simple GIS information that can be gathered using the Flood Modeller Pro interface.

As part of the project, CH2M modelled the 1D network of the Grand Union Canal using Flood Modeller Pro. The ability of the software to use operational rules together with full structure geometry allowed the detailed representation of the complicated system of sluices and culverts along the canal. The canal model was then connected to the existing model of the Ouzel.

Flood Modeller Pro also allows for the use of interpolated and replicated cross sections; this made it much faster to build a good model of the system.
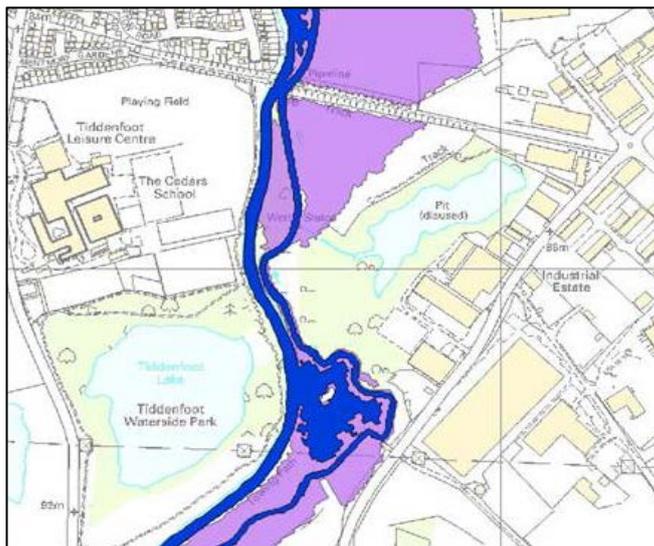
50% (blue) and 1% AEP (violet) raw flood maps at twelve arches weir. © Crown Copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. CH2M HILL 100021335 2015.

Once the simulations were run, Flood Modeller Pro was used to extract depth/velocity grids and create animations for the depth layer. The user-friendly post-processing and automation tools within the software streamlined this process, making the overall project much more efficient.

Contact us

Sales: +44 (0)845 094 7990
Support: +44 (0)845 094 7994
www.floodmodeller.com

JACOBS

With a legacy stretching back 40 years, Flood Modeller allows users to model rivers, floodplains and urban areas, using our powerful 1D and 2D solvers.