

computational modelling

Modelling expertise in flood risk, water management,
and the wider environment.



Computational Modelling is a fundamental tool used in the analysis of river dynamics, flood control and mitigation, river restoration and sediment-related environmental problems. Through our involvement with projects, policies and impact assessment we have extensive experience in applying 1D/2D hydrodynamic and morphodynamic modelling in riparian, estuarine and coastal environments. We are also experienced in using 2D/3D Computational Fluid Dynamics (CFD) modelling to analyse systems involving fluid flow, noise and odour propagation, heat transfer and associated phenomena such as chemical reactions by means of computer-based simulations.

Our numerical modelling expertise has been applied to Catchment Flood Management Plans, Flood Risk & Consequence Assessments, flood defence and river engineering, flood warning, land use planning, integrated urban drainage and surface water management plans, navigation and conservancy, geomorphology and ecology studies, engineering design and environmental impact assessment.

We provide numerical modelling services to a comprehensive range of clients including national governments, the Environment Agency, Defra, local authorities and development agencies, and many other private sector clients and industry.

computational fluid dynamics
hydrodynamic modelling
morphodynamic modelling
reservoir inundation modelling
sediment transport modelling

CAPITA SYMONDS

successful people, projects and performance

Prediction of Flood Hazard and Flood Risk in Gloucester

Application of linked 1D-2D TUFLOW models to analyse flood risk areas around Gloucester since 2004. Modelling has been undertaken to facilitate flood hazard mapping and advise on the flood risk implications of proposals to increase the resilience of critical infrastructure that was overwhelmed in June and July 2007.



River Trent Catchment Flood Management Plan (CFMP): Environment Agency

This is one of the largest CFMPs in the UK for a catchment covering an area of 10,450 km². The technical assessment included the development by Capita Symonds of one of the world's largest broadscale linked 1D-2D fully hydrodynamic models with the capacity to test the impacts of future scenarios involving land use change and climate change effects. The application of such high resolution modelling over such a large spatial extent is unparalleled in the UK.

Hereford Town Centre Flood Mitigation Scheme

A linked 1D-2D ISIS-TUFLOW model was developed to assess options for a Flood Mitigation Strategy to facilitate regeneration in Hereford. The challenge was to address the flood risk issues presented by a town centre redevelopment on land affected by inundation from local watercourses and drainage systems. Options were assessed using the hydraulic model for major off-site interventions together with an Integrated Urban Drainage solution to alleviate local pluvial flooding.

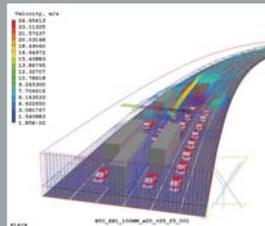


A69 Haydon Bridge Bypass

Hydrological, Hydraulic and Geomorphological Impact Assessment - a 1D-2D linked TUFLOW model was developed to investigate the impact of gravel deposition on flood risk. The model was used to determine the impact of gravel deposition on channel conveyance through hydraulic modelling of different gravel erosion and deposition scenarios.

Tidal, Coastal and Estuarine Modelling

Capita Symonds' experienced modelling team has expertise in 2 and 3 dimensional coastal and estuarine modelling. We have undertaken strategic modelling along coasts of the East, South and South West of England and in the Thames and Severn estuaries.



Bell Common Tunnel Refurbishment

3D Computational Fluid Dynamic modelling using PHEONICS (FLAIR) to inform the design of an efficient, versatile and energy efficient Saccardo nozzle tunnel ventilation system. The model was developed to assess whether the design provided appropriate ventilation levels in normal and emergency (fire) operation as well as during tunnel maintenance; maintain air quality and visibility levels; and minimise tunnel velocities at low level in the jet diffusion zone immediately downstream of the nozzles.

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