Urban Development Assessment

Urban areas are a fast developing and changing environment. As urban populations grow, new development is required to service the growth, increasing pressure on existing, and the need for new, infrastructure. The impact on stormwater runoff quantity and quality and on flooding of brownfield and greenfield developments requires accurate analysis to mitigate effects on neighbouring properties, the wider catchment and receiving water bodies.

The impacts of climate change also need to be factored into urban development planning and design to future proof our built environment.

Originally developed for 1D/2D coastal and estuarine modeling in the 1990s, TUFLOW was substantially enhanced to cater for the challenges of urban surface water and pipe network modeling from 2005 onwards. Today TUFLOW is widely used for urban surface water and pipe network drainage modeling with market leading capabilities.

TUFLOW software is integrated with GIS software, allowing urban designs to feed seamlessly into a development impact study both for flooding and drainage infrastructure purposes.

Enable your team to tackle the most challenging urban hydraulics with TUFLOW.

As researchers, scientists and engineers we work in a range of industries that solve complex environmental problems. Our assessments span scales from the molecular, to the global, from the instantaneous to the inter-decadal. Our projects require flexible, accurate, fast and powerful tools backed up by research, benchmarking and support.

TUFLOW

Scalable and flexible modeling for urban development impact assessments

TUFLOW Feature Focus

- Integrated 1D-2D modeling to assess all above and below ground aspects of urban drainage network.

- 1D and 2D shock capturing solvers that will reproduce the most challenging urban hydraulics.

- Quadtree mesh and sub-grid sampling that allows rapid and accurate representation of urban developments at any orientation to the 2D grid – more accurate and much faster to construct and simulate than a flexible mesh.

- Scalable modeling, from individual building footprints to city-scale.

- Powerful scenario and data layering options to allow assessment of different development and infrastructure rehabilitation options without duplicating data.

- Direct links with GIS and CAD allow development designs to be easily and efficiently implemented within TUFLOW.

- GPU acceleration provides substantial runtime benefits, providing results quicker with higher productivity turnover of development scenarios to be tested.
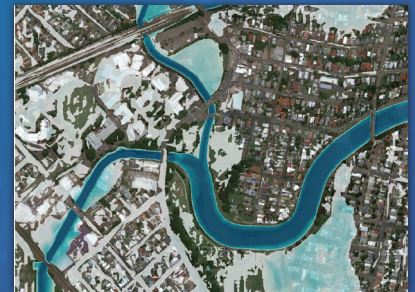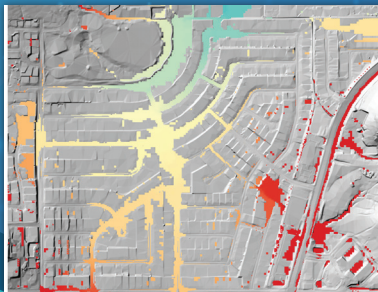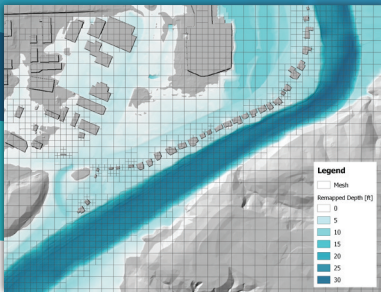
TUFLOW can quickly and reliably model the hydraulic impact of all urban development and infrastructure options to help fine-tune and turn designs into reality.

- With feature-rich 1D-2D modeling, TUFLOW covers all aspects of integrated urban drainage systems including complex structures and operational controls.

- Accurate integrated 1D-2D solver, with sub-grid sampling and Quadtree meshing, to accurately analyze the impact of development options on both surface and sub-surface drainage at any 2D grid orientation.

- Powerful scenario management options allow the modeler to add developments, or combinations of developments, to quickly assess the optimal development impact with no duplication of data.

- Flexible topographic options which allow CAD and GIS features to be used to easily modify model geometry.

TUFLOW is rigorously benchmarked against theory, lab scale experiments and real-world flood events. The high-resolution modeling results allows the user to conduct detailed flood hazard mapping down to the street and property scale, which is crucial for analysis of urban design and infrastructure risk assessment.

TUFLOW is uniquely integrated with numerous Geographic Information System (GIS) software such as ArcGIS, QGIS and MapInfo. This supports the seamless integration of urban planning and design with the analysis of the hydraulic impact. The open results formats allow model outputs to be clearly interpreted, communicated to a range of stakeholders, and enhances community engagement to empower informed decision making and better design tomorrows built environment.

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