



*Supplement of*

## **Urban surface water flood modelling – a comprehensive review of current models and future challenges**

**Kaihua Guo et al.**

*Correspondence to:* Mingfu Guan (mfguan@hku.hk)

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**Table S1. Literature pool**

No.	Author	Journal/ institute	Year	Title	Study area
1	Djordjevic S. et.al	Water Science and Technology	1999	An approach to simulation of dual drainage	Drainage network models
2	Mark O. et.al	Journal of Hydrology	2004	Potential and limitations of 1D modelling of urban flooding	
3	Schmitt T. G. et.al	Journal of Hydrology.	2004	Analysis and modelling of flooding in urban drainage systems	
4	Djordjevic S. et.al	Water Science & Technology	2005	SIPSON-simulation of interaction between pipe flow and surface overland flow in networks	
5	Rossman L.A.	US Environmental Protection Agency	2010	Storm water management model user's manual, version 5.	
6	Bradbrook K.F. et.al	International Journal of River Basin Management	2004	Two dimensional diffusion wave modelling of flood inundation using a simplified channel representation.	Simplified 2D shallow water models
7	Rao P	Environmental Modelling and Software	2005	A parallel RMA2 model for simulating large-scale free surface flows	
8	Yu D. et.al	Hydrological Processes: An International Journal	2006	Urban fluvial flood modelling using a two-dimensional diffusion-wave treatment, part 1: mesh resolution effects	
9	Hunter N.M. et.al	Geomorphology	2007	Simple spatially-distributed models for predicting flood inundation: A review	
10	Yu D	Environmental Modelling and Software	2010	Parallelization of a two-dimensional flood inundation model based on domain decomposition	
11	Bates P. et.al	Journal of Hydrology	2010	A simple inertial formulation of the shallow water equations for efficient two-dimensional flood inundation modelling	
12	Chen A.S. et.al	Journal of Hydrology	2012	A coarse-grid approach to representing building blockage effects in 2D urban flood modelling	
13	Almeida G. et.al	Water Resources Research	2013	Applicability of the local inertial approximation of the shallow water equations to flood modeling	
14	Zhang H	Newcastle University	2014	Urban flood simulation by coupling a hydrodynamic model with a hydrological model.	
15	Henonin J. et.al	Urban Water Journal	2015	Citywide multi-grid urban flood modelling: The July 2012 flood in Beijing	
16	Leandro J. et.al	Water Science and Technology	2016	A methodology for linking 2D overland flow models with the sewer network model SWMM 5.1 based on dynamic link libraries	
17	Sanders B. et.al	Advances in Water Resources	2019	PRIMo: Parallel raster inundation model	

18	Huang H. et.al	Hydrology Research	2019	An urban pluvial flood simulation model based on diffusive wave approximation of shallow water equations	
19	Audusse E. et.al	SIAM Journal on Scientific Computing	2004	A fast and stable well-balanced scheme with hydrostatic reconstruction for shallow water flows.	
20	Liang Q. et.al	Advances in water resources	2009	Numerical resolution of well-balanced shallow water equations with complex source terms.	
21	Toro E.F.	Springer Science & Business Media	2013	Riemann solvers and numerical methods for fluid dynamics: a practical introduction.	
22	Kim B. et.al	Journal of Hydrology	2015	Urban flood modeling with porous shallow-water equations: A case study of model errors in the presence of anisotropic porosity	
23	Guinot V. et.al	Advances in Water Resources	2017	Dual integral porosity shallow water model for urban flood modelling.	
24	Bruwier M. et.al	Journal of Hydrology	2017	Shallow-water models with anisotropic porosity and merging for flood modelling on Cartesian grids	
25	Glenis V. et.al	Environmental Modelling and Software	2018	A fully hydrodynamic urban flood modelling system representing buildings, green space and interventions	Full 2D shallow water models
26	Ferrari A. et.al	Advances in water resources	2019	Flood inundation modeling in urbanized areas: A mesh-independent porosity approach with anisotropic friction.	
27	Xia X. et.al	Advances in Water Resources	2019	A full-scale fluvial flood modelling framework based on a high-performance integrated hydrodynamic modelling system (HiPIMS).	
28	Seyoum S. D. et.al	Journal of Hydraulic Engineering	2011	Coupled 1D and Noninertia 2D Flood Inundation Model for Simulation of Urban Flooding	
29	Bazin P. H. et.al	Journal of Hydraulic Engineering	2014	Modeling flow exchanges between a street and an underground drainage pipe during urban floods	
30	Chen Y. et.al	Environmental Research	2015	Urban flood risk warning under rapid urbanization	Drainage network coupled to urban surface model (Overlap with the above does not repeat)
31	Leandro J. et.al	Water Science and Technology	2016	A methodology for linking 2D overland flow models with the sewer network model SWMM 5.1 based on dynamic link libraries	
32	Martins R. et.al	Journal of Hydroinformatics	2017	A comparison of three dual drainage models: Shallow water vs local inertial vs diffusive wave	
33	Li Q. et.al	Advances in Water Resources, 2020,137.	2020	A novel 1D-2D coupled model for hydrodynamic simulation of flows in drainage networks	
34	Yanqing L. et.al	Journal of Hydrology	2007	Coupling of hydrologic and hydraulic models for the Illinois River Basin	Hydrological coupled to hydrodynamic urban flood model
35	Bonnifait L. et.al	Advances in Water Resources	2009	Distributed hydrologic and hydraulic modelling with radar rainfall input: Reconstruction of the 8–9 September 2002 catastrophic flood event in the Gard region, France	

36	Mejia A.I. et.al	Journal of Hydrology	2011	Evaluating the effects of parameterized cross section shapes and simplified routing with a coupled distributed hydrologic and hydraulic model	
37	Kim J. et.al	Advances in Water Resources	2012	Coupled modeling of hydrologic and hydrodynamic processes including overland and channel flow	
38	Zhanyan L. et.al	Hydrology Research	2019	A coupled hydrological and hydrodynamic model for flood simulation	
39	Rajib A. et.al	Journal of Hydrology	2020	Towards a large-scale locally relevant flood inundation modeling framework using SWAT and LISFLOOD-FP	
40	Nardi, F. et.al	Irrigation and Drainage	2013	Comparing a large-scale DEM-based floodplain delineation algorithm with standard flood maps: The Tiber River Basin case study	Hydrogeomorphic approaches
41	Nardi, F. et.al	River Research and Applications	2018	Hydrologic scaling for hydrogeomorphic floodplain mapping: Insights into human-induced floodplain disconnectivity	
42	Di B, G. et.al	Natural Hazards and Earth System Sciences	2020	Brief communication: Comparing hydrological and hydrogeomorphic paradigms for global flood hazard mapping	
43	Dottori F. et.al	Physics and Chemistry of the Earth	2011	Developments of a flood inundation model based on the cellular automata approach: testing different methods to improve model performance.	
44	Ghimire B. et.al	Journal of Hydroinformatics	2013	Formulation of a fast 2D urban pluvial flood model using a cellular automata approach.	Other methods
45	Guidolin M. et.al	Environmental Modelling and Software	2016	A weighted cellular automata 2D inundation model for rapid flood analysis.	
46	Yaseen ZM. et.al	Journal of Hydrology	2015	Artificial intelligence based models for stream-flow forecasting: 2000-2015.	
47	Wolfs V. et.al	Environmental Modelling & Software	2014	Development of discharge-stage curves affected by hysteresis using time varying models, model trees and neural networks.	
48	Bermudez M. et.al	Water Resources Management	2018	Development and Comparison of Two Fast Surrogate Models for Urban Pluvial Flood Simulations.	