Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2020-655-RC1, 2021

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Urban surface water flood modelling – a comprehensive review of current models and future challenges" *by* Kaihua Guo et al.

Anonymous Referee #1

Received and published: 4 January 2021

Dear Editors, This manuscript is a review of existing numerical models to assess the performance of existing and new sewer systems during flooding conditions with surcharging manholes and shallow water on urban surfaces. The limitations and advantages of existing models are highlighted and could become references for the readers in this field, however, there are specific recent publications not considered that are extremely relevant and should be considered. The introduction nicely present the topic discussed and undertaken within the manuscript, however, crucial recent studies conducted within the same field and topic have been completely omitted by the authors. The introduction should be revised and these articles (see below) should be included within the text. The reference, which presents recent modelling issues in the

UK and China, should be included within paragraph 35 - M. Rubinato, A. Nichols, Y. Peng, J. Zhang, C. Lashford, Y. Cai, P. Lin, S. Tait. Urban and river flooding: Comparison of flood risk management approaches in the UK and China and an assessment of future knowledge needs. Water Science and Engineering, 12 (4), 274-283, https://doi.org/10.1016/j.wse.2019.12.004 In paragraph 40, mentioning data availability, it is not clear which data are needed. Nowadays one of the issues is that there is a paucity of data and those available to verify the performance of numerical models are water levels obtained from CCTV cameras, with poor quality. Additionally, in paragraph 50, authors mention the need of high quality data input. Therefore there is the need for experimental/field data to calibrate these models such as those provided by: Md.N.A. Beg, R.F. Carvalho, S. Tait, W. Brevis, M. Rubinato, A. Schellart, J. Leandro. (2018) A comparative study of manhole hydraulics using stereoscopic PIV and different RANS models. Water Science and Technology, 2017 (1), 87-98, http://wst.iwaponline.com/content/early/2018/02/28/wst.2018.089 Rubinato, J. Shucksmith, A. J. Saul, W. Shepherd. (2013) Comparison between Infoworks results and a physical model of an urban drainage system, Water Science and Technology, 68 (2), 372–379, http://wst.iwaponline.com/content/68/2/372 Gómez, M., and B. Russo. 2011. "Methodology to Estimate Hydraulic Efficiency of Drain Inlets." Proceedings of the Institution of Civil Engineers - Water Management 164 (2): 81–90. doi:10.1680/wama.900070 Lopes, P., J. Leandro, R. F. Carvalho, P. Páscoa, and R. Martins. 2015. "Numerical and Experimental Investigation of a Gully under Surcharge Conditions." Urban Water Journal 12 (6): 468–476. doi:10.1080/ 1573062X.2013.831916 Gómez, M.; Russo, B.; Tellez-Alvarez, J. Experimental investigation to estimate the discharge coefficient of a grate inlet under surcharge conditions. Urban Water J. 2019, 16, 85–91. M. Rubinato, R. Martins, J. Shucksmith. (2018) Quantification of energy losses at a surcharging manhole. Urban Water Journal, 15 (3), 234-241, https://www.tandfonline.com/doi/full/10.1080/1573062X.2018.1424217 Tellez-Alvarez, J., Gomez, M., Russo, B. (2020) Quantification of energy loss in two grated inlets under pressure. Water, 12, 1601, doi:10.3390/w12061601 M. Rubinato, L. Seungsoo,

R. Martins, J. Shucksmith. (2018) Surface to sewer flow exchange through circular inlets during urban flood conditions. Journal of Hydroinformatics, 20 (3), 564–576, DOI: 10.2166/hydro.2018.127 . R. Martins, M. Rubinato, G. Kesserwani, J. Leandro, S. Djordjevic, J. Shucksmith. (2018) On the characteristics of velocity fields on the vicinity of manhole inlet grates during flood events. Water Resources Research, 54 (9), 6408-6422, https://doi.org/10.1029/2018WR022782 Lee, S., H. Nakagawa, K. Kawaike, and H. Zhang. 2015. "Urban Inundation Simulation considering Road Network and Building Configurations." Journal of Flood Risk Management 9 (3): 224–233. doi:10.1111/jfr3.12165 Furthermore, during flooding events, there is the health risk associated with polluted water reaching areas where humans live and there is the need not only to characterize the hydraulic aspect of flooding events, but the pollutant transport too. Please see for example the paper below: MNA Beg, M Rubinato, RF Carvalho, JD Shucksmith. CFD Modelling of the Transport of Soluble Pollutants from Sewer Networks to Surface Flows during Urban Flood Events. Water 12 (9), 2514 METHODOLOGY The initial part composed by paragraphs 65-80 is not using a scientific language and should be revised to avoid expressions such as "this method can help scholars. . .", "this method was conducted in . . . and Google Scholar", it is normal that the research should be conducted via libraries and Google Scholar and these details are not needed. When authors introduce the equations they completely miss the crucial aspect of linking the two systems, pipes and urban streets. The weir and orifice equations are extremely important to quantify the flow exchange between these two systems and therefore please have a look at the following manuscript: M. Rubinato, R. Martins, G. Kesserwani, J. Leandro, S. Djordjevic, J. Shucksmith. (2017) Experimental calibration and validation of sewer/surface flow exchange equations in steady and unsteady flow conditions. Journal of Hydrology, 552, 421-432, https://doi.org/10.1016/j.jhydrol.2017.06.024 M. The manuscript can be definitely be considered for publication once the minor final comments are addressed. Authors have provided a rich analysis of existing techniques and limitations, however the lack of significant relevant studies needs to be dealt with before publication in this manuscript.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2020-655, 2020.